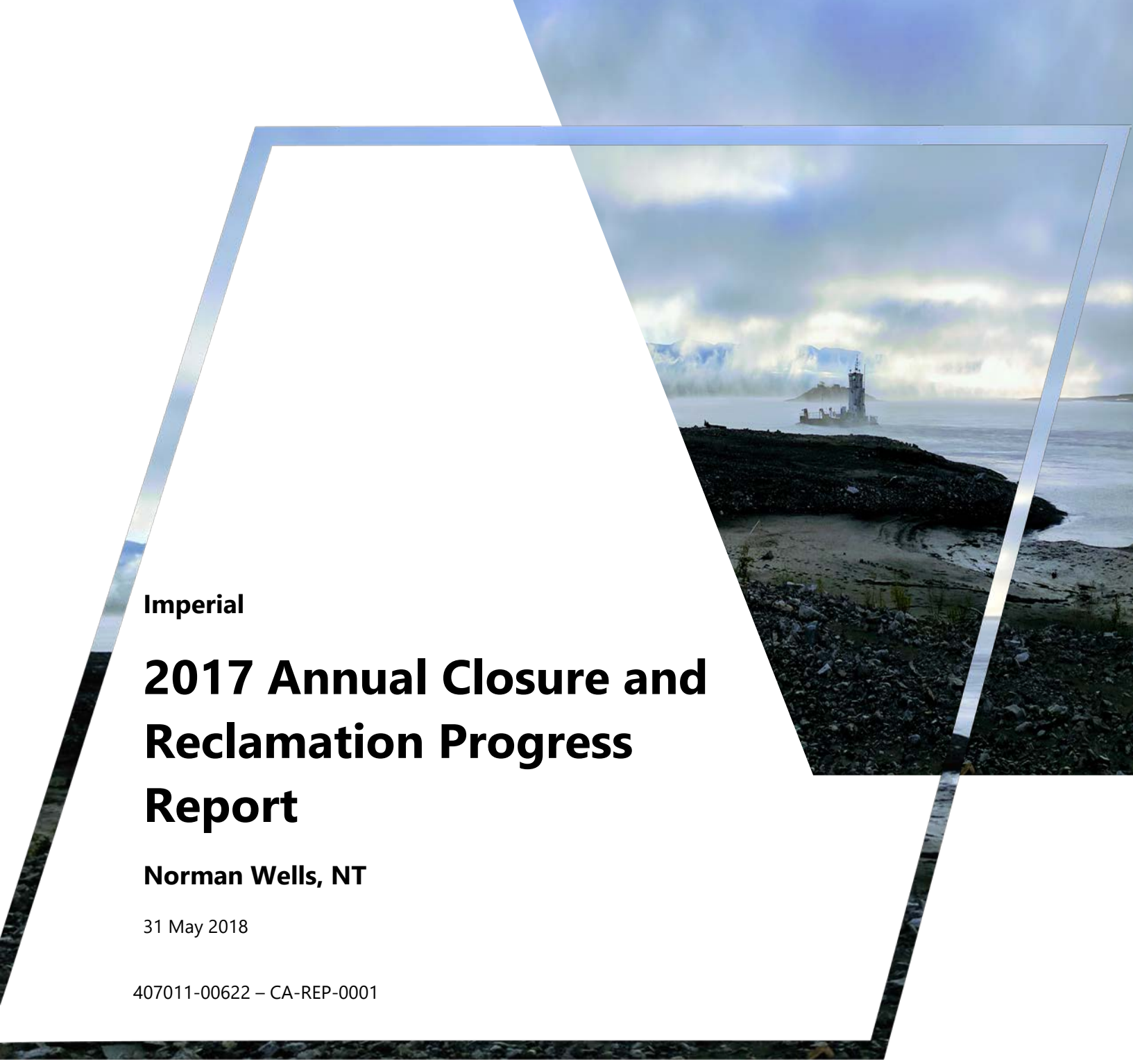


Imperial

2017 Annual Closure and Reclamation Progress Report

Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0001

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project 407011-00622 - 2017 Annual Closure and Reclamation Progress Report

Rev	Description	Orig	Review	Advisian Approval	Date	Client Approval	Date
0	Issued as final	L. Glatiotis	M. Brown	S. Gibb	31-May-18		

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons Canada Services Ltd., operating as Advisian (Advisian) for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and Advisian make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by Advisian with respect to this report and any conclusions or recommendations made in this report reflect Advisian' s judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of Advisian. Nothing in this report is intended to constitute or provide a legal opinion.

Contents

1. Introduction 1
1.1 Objective 1
1.2 Report Content and Format 1
2. Occupational Health and Safety 3
3. Remediation Guidelines 4
3.1 General 4
3.1.1 Soil 4
3.1.2 Water 4
3.2 Background Conditions 5
4. Closure and Reclamation Activities 6
4.1 Abandoned Wells and Sumps 6
4.2 Active Monitoring Wells 8
4.3 Mainland West 9
4.3.1 Central Processing Facility (CPF) 10
4.3.2 E-27X Well Site 10
4.3.3 Background/Control Point Locations 11
4.4 Mainland Central 11
4.4.1 Former Battery #3, and Battery #3 Flare Pit 12
4.4.2 Biocells, ARB and B-33X Area 13
4.4.3 F-31X Well Site 17
4.4.4 G-32X Well Site 17
4.4.5 E-33X Well Site 18
4.4.6 B-30X Well Site 18
4.4.7 Well Services/Warehouse Yard (WSY) 19

4.4.8 C-30X/C-32X, Bosworth Creek and Bosworth Delta Area 20
4.4.9 Background/Control Point Locations (Mainland Central Background) 22
4.5 Mainland East 22
4.5.1 Former Refinery Area 22
4.5.2 Former Reduced Crude Flare Pit (RCFP) 24
4.5.3 B-35X Well Site 25
4.5.4 B-38X/FTA Area 25
4.5.5 Mainland Tank Farm (MTF/TF) 26
4.5.6 B-42X Well Site 27
4.5.7 C-36X Well Site 28
4.5.8 C-38X Well Site 28
4.5.9 Former Fuel Tanks and Former Camp Area (FT/CAB) 29
4.5.10 Background/Control Point Locations (MEBG) 29
4.6 Sumps 30
4.6.1 Mainland Sumps 30
4.6.2 Cemetery Sump 32
4.6.3 C-27X Sump 33
4.7 Bear Island 33
4.7.1 Bear Island 1X Drill Pad 34
4.7.2 Bear Island BT1 34
4.7.3 Bear Island West Sumps (Sumps 1-5) 35
4.7.4 Former Tanks South of R-36X Well Site 36
4.7.5 Bear Island Flare Pit (BIFP) 37
4.7.6 Former Bear Island Battery and N-42X Well Site 38
4.7.7 Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites 39

4.7.8 Bear Island East Sump (Sump 6) 40
4.7.9 Bear Island Background/Control Points (BIBG) 41
4.8 Goose Island 41
4.8.1 Phase II Environmental Site Assessment 41
4.8.2 Groundwater and Surface Water Monitoring 42
4.8.3 Goose Island Background/Control Points (GIBG) 42
5. Quality Assurance / Quality Control (QA/QC) 43
5.1 Groundwater Sampling QAQC 43
5.1.1 Laboratory QAQC 43
5.1.2 Field QAQC - Field Duplicate Samples 43
5.1.3 Field QA/QC - Trip Blank Samples 43
5.1.4 Field QA/QC - Field Blank Samples 44
5.2 Soil Sampling QAQC 44
5.2.1 Field QAQC - Field Duplicate Samples 44
6. 2018 Closure and Reclamation Program 45
7. Closure 46

Tables within Text

Table A Summary of Closed Wells and Sumps 6
Table B Summary of Active Monitoring Wells (2017) 9

Tables

Table 1 Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities
Table 2A Groundwater Results: Field Measured Parameters

Table 2B Surface Water Results: Field Measured Parameters

Table 3A Groundwater Analytical Results: Indicator Parameters

Table 3B Surface Water Analytical Results: Indicator Parameters

Table 4A Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

Table 4B Surface Water Analytical Results: Petroleum Hydrocarbons (PHCs)

Table 5 Groundwater Analytical Results: Dissolved Metals and Trace Elements

Table 6A Groundwater Analytical Results: Total Metals and Trace Elements

Table 6B Surface Water Analytical Results: Total Metals and Trace Elements

Table 7 Groundwater Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

Table 8 Battery #3 Soil Treatment Results: General and Salinity Parameters

Table 9 2017 Mainland Sites Phase II ESA Soil Analytical Results: General and Salinity Parameters

Table 10 2017 Mainland Sites Phase II ESA Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

Table 11 2017 Mainland Sites Phase II ESA Soil Analytical Results: Total Metals and Trace Elements

Table 12 2017 Mainland Sites Phase II ESA Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

Table 13 ARB Reclamation Soil Analytical Results: General and Salinity Parameters

Table 14 Biocell Sampling Results: General and Salinity Parameters

Table 15 Biocell Sampling Results: Petroleum Hydrocarbons (PHCs)

Table 16 Biocell Sampling Results: Polycyclic Aromatic Hydrocarbons (PAHs)

Table 17 Refinery Bank Well Installations Soil Analytical Results: General and Salinity Parameters

Table 18 Refinery Bank Well Installations Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

Table 19 Refinery Bank Well Installations Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

Table 20 2017 Islands Sites Phase II ESA Soil Analytical Results: General and Salinity Parameters

Table 21 2017 Islands Sites Phase II ESA Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

Table 22 2017 Islands Sites Phase II ESA Soil Analytical Results: Metals and Trace Elements

Table 23 2017 Islands Sites Phase II ESA Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

Figures

Figure 1 Site Location Map

Figure 2 Site Layout

Figure 3A Mainland West Areas

Figure 3B Mainland West – 2017 Groundwater Monitoring

Figure 4A Mainland Central Areas

Figure 4B Mainland Central – 2017 Phase II ESA (Battery #3 Flare Pit)

Figure 4C Mainland Central – 2017 Phase II ESA (Biocells)

Figure 4D Mainland Central – 2017 Phase II ESA (E-33X Well Site)

Figure 4E Mainland Central – 2017 Phase II ESA (B-30X Well Site)

Figure 4F Mainland Central - 2017 Groundwater and Surface Water Monitoring

Figure 5A Mainland East Areas

Figure 5B Mainland East – 2017 Refinery Bank Well Installations

Figure 5C Mainland East – 2017 Phase II ESA (B-42X Well Site)

Figure 5D Mainland East – 2017 Groundwater and Surface Water Monitoring

Figure 5E Refinery Bank (Mainland East) – 2017 Groundwater and Surface Water Monitoring

Figure 6A Mainland Sumps Area

Figure 6B Mainland Sumps – 2017 Groundwater and Surface Water Monitoring

Figure 7A Bear Island Areas

Figure 7B Bear Island – 2017 Phase II ESA (Bear Island BT1)

Figure 7C Bear Island – 2017 Phase II ESA (Bear Island Flare Pit)

Figure 7D Bear Island – 2017 Phase II ESA (Bear Island East Sump)

Figure 7E Bear Island – 2017 Groundwater and Surface Water Monitoring

Figure 8A Goose Island Areas

Figure 8B Goose Island – 2017 Phase II ESA

Figure 8C Goose Island – 2017 Groundwater and Surface Water Monitoring

Photographs within Text

Photo A Vegetation Regrowth at ARB Remedial Excavation.....14

Photo B Installing Sentinel Well North of Soil Treatment Pad.....15

Photo C Bosworth Creek East Bank Revegetation.....21

Appendices

Appendix 1 Water Licence S13L1-007

Appendix 2 List of Acronyms, Abbreviations and Definitions

Appendix 3 Soil and Groundwater Geochemical Background Conditions

Appendix 4 Areas of Potential Environmental Concern (APECs)

Appendix 5 Conceptual Site Model: Battery #3 Flare Pit

Appendix 6 Conceptual Site Model: Refinery Bank

Appendix 7 Conceptual Site Model: B-38X Area

Appendix 8 Conceptual Site Model: Mainland Sumps

Appendix 9 Conceptual Site Model: Bear Island BT1

Appendix 10 Conceptual Site Model: Bear Island Sumps

Appendix 11 Conceptual Site Model: Bear Island Flare Pit

Appendix 12 Norman Wells Closure and Reclamation Work Areas Summary

1. Introduction

This report has been prepared to meet Part J, Section 4 of Norman Wells Water Licence S13L1-007 (Appendix 1), and is not intended to fulfill all of the Water Licence obligations. This report is intended to provide the Sahtu Land and Water Board (SLWB) with a status update of closure and reclamation activities at the Imperial Oil Resources (IOR) Norman Wells site (the Site), as illustrated on Figure 1. Closure and reclamation activities at the Site are managed by Imperial Environmental Services (IES); portions of the Site under IES management are illustrated on Figure 2. Operating areas across the Site are managed by the IOR onsite operations team, and are not discussed in detail in this report.

1.1 Objective

The objectives of the Norman Wells Annual Closure and Reclamation (C&R) Progress Report are threefold:

- to provide the SLWB with a status update of the overall C&R program;
- to help regulatory inspectors assess alignment of C&R activities with commitments made in C&R plans previously approved by the SLWB; and
- by addressing the above two objectives, to meet the Terms and Conditions (Part J, Section 4) of the Norman Wells Water Licence S13L1-007. Some of the information required by the Water Licence is provided separately by the IOR onsite operations team.

1.2 Report Content and Format

The 2017 Annual C&R Report provides details of C&R work completed by IES in Norman Wells, in accordance with the reporting needs and specifications of the SLWB. Work completed to date is summarized in table format in this document. This annual report provides a summary of the work completed in 2017. Historical information can be found in previously submitted annual reports.

Tables 1 through 7 present 2017 groundwater and surface water chemistry data, while Tables 8 through 23 present 2017 soils chemistry data.

A list of acronyms, abbreviations and definitions is provided in Appendix 2.

An updated summary of geochemical background conditions across the Norman Wells site, including data collected in 2017, is presented in Appendix 3.

A table summarizing all identified or potential Areas of Potential Environmental Concern (APECs), as well as a series of figures illustrating these APECs, is included as Appendix 4.

Conceptual Site Models (CSMs) for seven major sub-sites across the Norman Wells field have been developed for inclusion in this report. These are presented in Appendices 5 through 11, and include:

- Battery #3 Flare Pit;
- Refinery Bank;

- B-38X Area;
- Mainland Sumps;
- Bear Island BT1;
- Bear Island Sumps; and
- Bear Island Flare Pit.

A summary of closure and reclamation works at the Site, including current status and planned future works, is presented in Appendix 12.

Consistent with the modified 2009 through 2016 report formats, this 2017 report also includes:

- larger scale figures illustrating soil sampling locations and monitoring well installations drilled from 2008 through 2017 over the entire Norman Wells lease area. Note that soil monitoring locations drilled prior to 2017 are not shown on these figures; and
- tables summarizing the soil and water laboratory analytical data from environmental site assessment (ESA) activities undertaken in 2017.

2. Occupational Health and Safety

IES has a formal occupational health management system in place for all work completed at the Site. Specifics of this management system are not discussed in this report. This section is intended to identify situations and/or materials that are periodically encountered during C&R activities, but are not normally encountered in the context of typical IES work at the Site, such as:

- asbestos;
- lead;
- PCBs; and
- mercury.

The management and removal of these materials has been described in previous reports. None of these materials were encountered during the 2017 work program.

In addition to the special materials management requirements noted above, IES applies a comprehensive set of occupational health and safety standards, protocols and procedures to every task undertaken at the Site. Of particular note are the extensive ground disturbance procedures that are undertaken prior to conducting any intrusive drilling or excavation activities associated with the C&R program. All lead project personnel are trained and certified in ground disturbance procedures and each ground penetration location is typically surveyed and cleared by two independent survey companies, to ensure that all underground infrastructure within 30 m of the work area has been identified and clearly marked. Where necessary, infrastructure is exposed to confirm locations before drilling or excavation is initiated.

3. Remediation Guidelines

3.1 General

IES has proposed that clean-up guidelines for the Norman Wells site be consistent with established Canada-wide standards as defined by the Canadian Council of Ministers of the Environment (CCME). Given the northern setting of Norman Wells and certain unique aspects of the Site (i.e. discontinuous permafrost and the presence of natural oil seeps), the CCME concept of risk-based closure is deemed to represent the most appropriate remedial standard for the Norman Wells C&R program.

For the purposes of this report and as interim remediation targets, analytical results are compared to existing contaminated site assessment and remediation guidelines, as well as background soil and water conditions. Relevant background information related to natural seeps is provided alongside the background geochemical parameters in Appendix 3. Any comparisons in this report to background conditions are in reference to the historically-established ranges in this Appendix.

The Government of the Northwest Territories (NT) has adopted the soil guidelines established by the CCME, which are based on specific land uses (agricultural, residential/parkland, commercial and industrial). Current CCME Canadian Environmental Quality Guidelines (CEQG) are considered to be the most relevant and appropriate.

3.1.1 Soil

Soil analytical results have been compared to the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health and to the CCME Canada-wide Standards for Petroleum Hydrocarbons (PHC) in Soil (PHC F1 to F4 only). Appropriate land uses under the CCME framework have been applied as follows:

- for comparison of soil analytical data from C&R work conducted on the Mainland portion of the Norman Wells lease, CCME CEQG guidelines for Industrial land use have been applied; and
- for comparison of soil analytical data for C&R activities on Bear and Goose Islands as well as some Town sites, CCME Residential/Parkland guidelines are more consistent with the expected end land use.

It is important to note that the CCME guidelines illustrated on the soil data tables in this report are used for generic assessment purposes only and do not necessarily indicate a risk to any specific environmental or human health receptor. The applied guidelines are consistent with the approved Interim Closure and Reclamation Plan (ICRP). The potable groundwater and vapour inhalation pathways have been excluded across all sites. Soil grain-size has been selected on a per site basis; however, most areas within the Site have been determined to be fine-grained.

3.1.2 Water

At present, no specific groundwater quality guidelines exist for the NT. As a conservative measure, groundwater and surface water quality assessment parameters in this report and the C&R program in general are compared to the CCME Freshwater Aquatic Life (FWAL) guidelines, as well as background water quality

conditions where available. It is important to note that exceedances of the FWAL values do not necessarily indicate a facility-related source, and may reflect natural conditions.

The FWAL water quality guidelines for a number of trace metals vary depending on the pH and total hardness of the water (see footnotes of Tables 5 and 6). For the purpose of selecting appropriate guidelines for comparison to Norman Wells shallow groundwater and surface water samples, the pH value is considered greater than 6.5, and the total hardness as calcium carbonate ($CaCO_3$) is greater than 850 mg/L (very hard water). The 95th percentile values for groundwater samples from background locations in different hydrogeological units are as follows:

- for surficial sediments on the Mainland: pH of 8.1 and hardness of 1,253 mg/L;
- for surficial sediments on the islands: pH of 8.0 and hardness of 1,600 mg/L; and
- for shallow bedrock on the Mainland and the islands: pH of 8.5 and hardness of 350 mg/L.

Details of the background wells and calculated background geochemistry for the distinct hydrogeological units listed above, as well as areas of natural seepage, are described further in Appendix 3.

3.2 Background Conditions

The CCME environmental quality guidelines have been used to screen site-specific data being collected at the Norman Wells site, unless background conditions for soil or water indicate that the guideline values are not appropriate or representative of actual Site conditions. Background information collected to date is further described in Appendix 3. Background soil or water parameter values which exceed the above-noted CCME guidelines are indicated and rationalized in Appendix 3. The reported background values or ranges are assumed to supersede the corresponding CCME guidelines unless otherwise stated.

Each year, additional water samples are collected from selected background locations and added to the database. Results are reported in the attached data tables. The statistical background values for groundwater and soil were first calculated in 2013. Revised statistical analyses updated with additional data collected from 2013 to 2017 are summarized in Appendix 3.

4. Closure and Reclamation Activities

The following sections detail the 2017 C&R Program. A brief description and summary of work completed during 2017 is provided for each sub-area on the Norman Wells site. Portions of the Site that did not have work done as part of the 2017 program have been omitted from this annual report but are included in the summary table in Appendix 12. The primary Norman Wells work areas are illustrated on Figure 2.

The summary table in Appendix 12 outlines the start date and current status of various C&R activities undertaken at each Norman Wells sub-area between 1996 and present day.

4.1 Abandoned Wells and Sumps

In accordance with the Water Licence terms and conditions (Schedule 7, item p), the following Table A lists abandoned wells and sumps, their current status, and planned mitigation. The 2017 C&R Program did not necessarily include work at all sites listed in Table A.

Table A Summary of Closed Wells and Sumps

Facility Identifier	Location	Current Status	Planned Mitigation
Cemetery Sump	Mainland West	Decommissioned and capped, screening level risk assessment complete. Surface restoration as of 2010.	Continued groundwater and vegetation monitoring, development of long term management strategy.
C-27X Well Site	Mainland West	Well cut and capped in 2015, above-ground infrastructure removed. Phase II ESA completed. Supplemental Phase II ESA completed in 2016.	Reclamation as required to meet CCME Industrial guidelines.
C-27X Sump	Mainland West	Decommissioned and capped. Supplementary Phase II ESA works conducted in 2014 and 2015. Sump dewatered and capped in 2015. Liner placed over cap and additional material added on top of liner in 2016.	Continued groundwater and vegetation monitoring, development of long term management strategy.
E-33X Well Site	Mainland Central	Well cut and capped in 2014, above-ground infrastructure removed and Phase II ESA completed. Supplemental Phase II ESAs completed in 2016-2017.	Reclamation as required to meet CCME Industrial guidelines.

Facility Identifier	Location	Current Status	Planned Mitigation
B-42X Well Site	Mainland East	Well cut and capped in 2014, above-ground infrastructure removed and Phase II ESA completed. Supplemental Phase II ESA completed in 2017.	Reclamation as required to meet CCME Industrial guidelines.
E-27X Well Site	Mainland West	Well cut and capped in 2014, above-ground infrastructure removed and Phase II ESA completed.	Reclamation as required to meet CCME Industrial guidelines.
Mainland Sumps 1 to 6	Mainland Sumps	Decommissioned and capped. Phase II ESA completed. Long term management strategy developed in 2014. Supplementary Phase II ESA completed in 2015. Depressions in Sumps 1, 3, 5 and 6 dewatered and backfilled with clean soil in 2016.	Continued groundwater, surface water and vegetation monitoring. Further monitoring for physical stability as required.
Bear Island Sumps 1–6	Bear Island	Decommissioned and capped. Supplemental Phase II ESA conducted in 2014. Additional Phase II delineation ESAs completed in 2016-2017.	Continued groundwater and vegetation monitoring, development of long term management strategy. Reclamation of select areas.
Bear Island Flare Pit	Bear Island	Remedial excavation for source removal and supplemental Phase II ESA undertaken in 2014. Supplemental Phase II ESAs completed in 2016-2017.	Reclamation as required to meet CCME Parkland guidelines.
O-29X Well Site	Goose Island	Well cut and capped in 2014, above-ground infrastructure removed and Phase II ESA completed. Supplemental Phase II ESA completed in 2017.	Reclamation as required to meet CCME Parkland guidelines.
T-08X Well Site	Goose Island	Well cut and capped in 2015, above-ground infrastructure removed and Phase II ESA completed.	Reclamation as required to meet CCME Parkland guidelines.

4.2 Active Monitoring Wells

The following Table B summarizes the active groundwater monitoring wells in each of the Norman Wells areas current to December 2017. These wells constitute part of the monitoring program for areas where C&R activities have occurred, are ongoing, or are anticipated to occur. The monitoring program has been optimized annually with the installation of new wells and removal of wells or parameters from scope that are shown, through data, to no longer be required. Decisions to reduce or increase the number of monitoring wells and analytical package in different areas are based on a combination of statistical analysis of data, appropriate spatial coverage and data needs.

Water sampling programs have been rationalized in recent years as follows:

- For the most part, wells greater than 15 metres (m) depth are not sampled, with the exception of wells drilled since 2009. These wells were generally removed from the groundwater program because the historic database has shown that natural occurrences (i.e. not facility-related) of hydrocarbons and/or saline groundwater tend to dominate in the deeper monitoring locations;

- If a measurable thickness of free-phase hydrocarbons is present, groundwater from the well is not sampled, but fluid levels are recorded. Additionally, where free-phase is encountered it is removed from the well (using a dedicated bailer) and disposed of at the F-31X wastewater treatment and injection facility;

- All wells in the network having less than three consecutive years of chemistry data are sampled for full routine potability parameters (with the exception of fluoride), benzene, toluene, ethylbenzene and xylene (BTEX) compounds, petroleum hydrocarbon fractions F1 and F2, phenols and dissolved metals. This comprehensive schedule is intended to provide several years of analytical data from which trends may be observed at these relatively new monitoring locations; and

- Monitoring wells in the network having more than three consecutive years of chemistry data are sampled for a reduced analytical schedule. Monitoring at these wells is intended to maintain an adequate spatial coverage for the overall program in relation to potential receptors, for parameters of interest based on statistical trends in historical data, and expected chemicals of potential concern (COPC) based on the current and historical operations nearby.

Phase II ESAs in 2017 included the advancement of 43 boreholes for soil sampling and the installation of 10 shallow groundwater monitoring wells. Assessments focused on areas where data gaps had been identified during previous investigations, and on delineation for future remediation planning.

It should be noted that due to the significant ice scouring effects on the Mackenzie River shoreline during spring ice breakup, monitoring wells installed within 100 m of the river may be subject to damage or destruction each year. The exact number of wells monitored, therefore, may change from year to year.

Table B Summary of Active Monitoring Wells (2017)

Monitoring Area [1]	Actively Monitored Wells		
	Overburden	Bedrock	Total [1]
Former Refinery	0	12	12
Mainland West	16	3	19
Mainland Central	33	4	37
Mainland East (excl. Refinery)	34	1	35
Mainland Sumps	16	7	23
Bear Island	53	0	53
Goose Island	4	0	4
Totals	**156**	**27**	**183**

Notes:
[1] Totals do not include remedial extraction wells or certain Operations monitoring wells (i.e. Goose Island O-18X network which is reported under separate cover)

In addition to the above-noted groundwater monitoring program, individual areas are being monitored for physical stability (visual inspection for backfill settlement) and/or re-vegetation success following surface reclamation activities. This monitoring was conducted at the following areas in 2017:

- ARB remedial excavation area; and
- Bosworth Creek east bank.

These areas are discussed in more detail in Sections 4.4.2.1 and 4.4.8.2 respectively.

4.3 Mainland West

The Mainland West area includes the land area bounded by Bosworth Creek and the IOR barge dock area to the east, the J-16X well site to the west, the Mackenzie River to the south and the Site access ring road and fire break to the north (Figure 3A).

C&R works undertaken in Mainland West in 2017 included groundwater monitoring at the following areas (Figure 3B):

- Central Processing Facility (CPF);
- E-27X Well Site; and
- Background/Control Point Locations (MWBG/WBIO).

Two other sub-areas within Mainland West, the Cemetery Sump and C-27X Sump, are discussed in Sections 4.6.2 and 4.6.3, respectively.

The following subsections provide summaries for areas where C&R activities were undertaken in 2017. Related groundwater and surface water data are listed in Tables 1-7.

4.3.1 Central Processing Facility (CPF)

The Central Processing Facility (CPF) is located north of the Mackenzie River and west of Bosworth Creek, at the west end of the developed Mainland area. Based on review of aerial photographs, construction of the CPF began around 1983. The CPF was operational until 2017, when oil production works were temporarily suspended pending repairs to the Enbridge pipeline that services the facility.

Restricted access due to the presence of operational infrastructure has limited the extent of historical impact assessments. Approximately 57 spills within the CPF footprint were reported to the NEB between 1999 and 2008. Although efforts have been made to characterize and delineate identified sources/impacts within the facility, facility decommissioning will be required before full delineation can be achieved.

A network of monitoring wells has been installed in and around the current CPF footprint, and these serve to assess the potential for migration of facility-related impacts towards nearby receptors (i.e. Bosworth Creek).

4.3.1.1 Groundwater Monitoring

Fourteen groundwater monitoring wells have been installed in and around the CPF since 1997, seven of which remain part of the active groundwater monitoring network and were sampled in 2017. Results of the 2017 sampling and analytical program are summarized as follows:

- groundwater is inferred to flow east towards Bosworth Creek, although discontinuous permafrost may locally influence groundwater flow;
- one monitoring well had a field-measured pH value which fell outside of the acceptable CCME guideline range; and
- exceedances were observed at seven monitoring wells for one or more parameters including total phenols (one well), dissolved iron (six wells), arsenic (one well), cadmium (one well), selenium (three wells), and uranium (two wells).

Monitoring well locations are shown on Figure 3B.

4.3.2 E-27X Well Site

The E-27X well site is located approximately 150 m south of the CPF Backwash Pond, within the same well pad as F-25X, G-26X, H-27X and G-28X. The E-27X well site was selected to represent wells located between the Mackenzie River and the majority of the Mainland infrastructure.

In 2014, the E-27X wellhead was abandoned, and adjacent underground utilities were cut and capped. Soil samples collected from around the wellhead and underground utilities returned above-guideline concentrations of xylenes, PHC F1-F4G, arsenic, nickel, thallium and zinc. A preliminary Phase II ESA, consisting of three delineation test pits around the former wellhead, was also completed following infrastructure

abandonment activities in 2014. Guideline exceedances were identified to the northwest of the wellhead (PHC F1-F4G), between the abandoned flowline and above ground utilidor.

4.3.2.1 Groundwater Monitoring

Two groundwater monitoring wells exist within the E-27X area; however, one of these wells has historically been dry or frozen and has thus been removed from the analytical schedule. The remaining well is installed in the shallow bedrock groundwater-bearing zone. Results of the 2017 sampling program are summarized as follows:

- an insufficient number of wells exist in the area to accurately determine the direction of deeper groundwater flow; however, based on local topography and proximity to the Mackenzie River, the inferred direction of flow is south towards the river; and
- the dissolved chloride concentration exceeded the FWAL guideline.

The monitoring well location is shown on Figure 3B.

4.3.3 Background/Control Point Locations

Two monitoring wells were included in the groundwater monitoring program in order to assess background hydrochemistry in the Mainland West area. One of these locations (WBIO 08-1-2) was dry and could not be sampled in 2017. The other monitoring location (MWBG-10-1-3) was sampled to supplement the existing background geochemistry database. Dissolved metals concentrations including cadmium and copper exceeded the FWAL guidelines, as did the total phenols concentration.

Well locations are shown on Figure 3B.

4.4 Mainland Central

The Mainland Central portion of the Site includes the land area bounded by Bosworth Creek and the IOR barge dock area to the west, the former Battery #3 site to the east, the Mackenzie River to the south and the Site access ring road to the north (Figures 2 and 4A).

C&R work in 2017 included groundwater and surface water sampling, borehole drilling and soil sampling, and vegetation assessments. C&R work was conducted at the following Mainland Central areas in 2017:

- Battery #3 Flare Pit (BT3);
- Biocells (ARB/BC2);
- F-31X Well Site (F31);
- G-32X Well Site (G32);
- E-33X Well Site (E33);
- B-30X Well Site (B30);
- Well Services/Warehouse Yard (WSY);
- Bosworth Creek and C-30X/C-32X Well Sites (BOS/C30); and

- Background/Control Point Locations (MCBG).

4.4.1 Former Battery #3, and Battery #3 Flare Pit

The former Battery #3 site is located on the east side of Bosworth Creek, approximately 200 m north of the Mackenzie River. Battery #3 was operational from the 1940s until circa 1990. C&R activities on the site started in 1997 with decommissioning and dismantling, followed by detailed site characterization (geophysical surveys, soil and groundwater investigations). The Battery #3 area includes a former flare pit area, a former tank farm area and a former process area.

Previous investigations and a 2014 Remedial Action Plan identified an area of salt and hydrocarbon impacted soil underlying, and downgradient of, the former flare pit. The zone of impact extended to a depth of approximately 5 m below ground surface. In early 2016, Englobe Corporation of Quebec (Englobe) was contracted to construct a soil treatment cell and leachate collection pond at the former B-33X Well Site to the north of the proposed excavation area. The soil treatment strategy was soil washing, primarily for the purpose of reducing soil chloride concentrations.

Following cell construction, a remedial excavation was completed at the former Battery #3 Flare Pit area to excavate impacted soil and transport it to the treatment cell for on-site remediation. Approximately 5,760 m^3 of soil was excavated, with approximately 5,000 m^3 transported to Englobe's cell for treatment. The remaining soil was transported to Biocell 2 for storage until the next treatment cycle.

A CSM has been developed for the Battery #3 Flare Pit, and is presented in Appendix 5.

The 2017 C&R activities included a supplementary Phase II ESA and continued groundwater monitoring, as summarized below.

4.4.1.1 Soil Remediation

Treatment of the chloride impacted soil in the cell was not continued during the 2017 field season. As no suitable disposal location was available during the plant shutdown for impacted water produced during the washing process, it was not deemed feasible to execute in 2017. If deemed appropriate, the program will resume treating the 5,000 m^3 of soil currently on the treatment pad following resumption of plant activities on-site. Related data are listed in Table 8.

4.4.1.2 Phase II Environmental Site Assessment

Three boreholes were advanced in 2017 at the Battery #3 Flare Pit area to the north/northeast of the 2016 excavation footprint. Guideline exceedances of electrical conductivity, PHC F2, F3, F4G, naphthalene and/or phenanthrene were reported in all three of the soil borehole locations.

Borehole locations are shown on Figure 4B, while soil data are provided in Tables 9 to 12.

4.4.1.3 Groundwater Monitoring

The 2017 annual groundwater monitoring program focused on continued well network and analytical schedule refinement, field parameter measurements, and groundwater sampling for laboratory analyses. The 2017 results are summarized as follows:

- six wells within the Battery #3 area were included in the 2017 groundwater monitoring program (BT3-series wells in Table 1);
- groundwater surface elevations in the Battery #3 area indicated that groundwater flow was generally south and west towards Bosworth Creek;
- flow through open fractures is expected to be the dominant transport mechanism for groundwater migration in the bedrock. Natural hydrocarbon and saline water seepage originating from deeper bedrock would be subject to the local upward vertical hydraulic gradient, and as such may be seen in shallower intervals;
- exceedances were observed at five monitoring wells for one or more parameters including chloride (four wells), dissolved arsenic (one well), dissolved boron (two wells), dissolved iron (three wells), and pyrene (one well); and
- the reportable detection limit for nitrite (as N) was raised above the applied CCME FWAL guideline due to matrix interference in two samples.

Monitoring well locations are shown on Figure 4F.

4.4.2 Biocells, ARB and B-33X Area

The Biocell area is located on the Mainland, east of the production warehouse and north of the C-32X well site, and consists of Biocell 1 (formerly Biocell A/ARB and Biocell B/Operations Biocell/OPB), Biocell 2 (formerly referred to as "Yard D"), and the area of former production well B-33X (Figures 4A/C). Biocell operations for hydrocarbon treatment are described in Section 4.4.2.4.

Previous investigations have confirmed the presence of benzene, ethylbenzene, xylenes and PHC F1 at levels above CCME Industrial guidelines in the soils directly south of the current Biocells footprint. These hydrocarbon impacts pre-date Biocell 1 construction and operation, which commenced in 2001. A second Biocell (Biocell 2) was constructed directly east of Biocell 1 in 2014.

In 2013, a Phase II ESA was conducted and remedial excavation works were initiated at the site. In 2014, a supplemental Phase II ESA was completed alongside continuation of the remedial excavation. Further remedial excavation works were conducted in 2015 with the removal of 6,520 m^3 of impacted soil, much of which was treated in the on-site Biocells and reused as backfill at various locations. The excavation around the warehouse access road was continued during the 2016 field season.

The former production well B-33X, situated southwest of Biocell 1 and Biocell 2, has been abandoned and capped. The B-33X Well Site area is currently used as a soil treatment pad, which was constructed by Englobe Corporation (Englobe) in 2016. A process water pond, two amendment tanks, one freshwater storage tank and an equipment container were also installed adjacent the soil treatment pad. A discussion of the Englobe treatment cell is included in Section 4.4.1.

In 2017, C&R activities included groundwater and surface water monitoring, and continued remedial activities in the Biocells and the ARB excavation area. A supplementary Phase II ESA around the Englobe soil washing pad was also conducted in 2017.

4.4.2.1 Abandonment and Reclamation Biocell (ARB) Reclamation

A reclamation assessment was conducted in June 2017 to determine the current site conditions and to identify any deficiencies with respect to vegetation, topsoil and landscape parameters. Seven vegetation plots located south of Biocell 1 (Figure 4C, Photo A) were assessed and soil samples were collected from three of the plots for analysis of soil nutrient composition, as related to reclamation suitability. Data are listed in Table 13.

In August 2017, soil was imported to the site from the Biocell and was used to re-contour the site for improved runoff drainage and to minimize ponding of surface water. In September 2017, areas of the site with higher percentages of bare ground were surface roughened and reseeded.

Photo A Vegetation Regrowth at ARB Remedial Excavation



4.4.2.2 Phase II Environmental Site Assessment

Three boreholes were advanced around the Englobe soil treatment pad in 2017, all of which were completed as monitoring wells (Photo B). Locations are shown on Figure 4C, while related soils data are in Tables 9 to 12. These locations were intended to provide ongoing monitoring for potential facility-related groundwater impacts. All soils results were below the applied guidelines. All three monitoring wells had groundwater pH values which fell outside of the CCME FWAL guideline range of 6.5-9.0, and one well returned an above-guideline concentration of dissolved iron.

Photo B Installing Sentinel Well North of Soil Treatment Pad



4.4.2.3 Groundwater and Surface Water Monitoring

Twelve groundwater monitoring wells were sampled in the 2017 sampling program for the Biocells area (ARB and BC2 series wells, Table 1). Two surface water monitoring locations adjacent the soil treatment pad were also sampled in 2017. Results of the 2017 sampling program are summarized below:

- groundwater in the area is expected to flow generally south, towards Bosworth Creek and the Mackenzie River. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost;
- three monitoring wells had a field-measured pH value which fell outside of the acceptable CCME guideline range; and
- exceedances were observed at eleven monitoring wells and two surface water locations for one or more parameters including nitrite (as N) (one well), total phenols (seven wells and two surface water locations), dissolved arsenic (three wells), dissolved cadmium (two wells), dissolved copper (three wells), dissolved iron (four wells), dissolved selenium (four wells), dissolved uranium (one well), total iron (two surface water locations), and total selenium (one surface water location).

Three monitoring wells were installed as part of the 2017 Phase II ESA and were sampled after the annual groundwater monitoring program was completed. The results of this sampling are summarized below:

- an exceedance of dissolved iron was observed at one monitoring well.

Monitoring well locations are shown on Figure 4F.

4.4.2.4 Biocell Operations

In 2001, Imperial constructed two synthetically-lined, engineered Biocells for batch treatment of hydrocarbon-affected soils. Soils were transported to the Biocells from various locations across the field, after they had been appropriately characterized and deemed suitable for potential bioremediation.

In 2012, the two original Biocells were decommissioned and replaced with a single larger capacity engineered Biocell (Biocell A, now Biocell 1). In 2014, an identical cell (Biocell 2) was constructed directly to the east of Biocell 1 and commissioned for use in 2015 (Figure 4C).

The 2017 scope of work for Biocells 1 and 2 included the following activities:

- daily subcontractor management;
- collection of representative soil samples from source material prior to Biocell acceptance and treatment;
- supervision of impacted soil placement within the Biocells;
- treatment of hydrocarbon impacted material not meeting industrial land use guidelines, in accordance with the Biocell Operations Guidance Manual;
- monitoring runoff water in sumps, management of third party collection of water samples, and disposal, as appropriate;
- surveying windrows within each Biocell to determine soil volumes;
- determining required soil amendments (nutrients) to enhance soil bioremediation;
- collection and analysis of representative soil samples from all soil undergoing treatment within the Biocells;
- removal of material meeting selected remedial guidelines from the Biocells to a stockpile location for future use; and
- conducting routine maintenance on the Biocells, as required.

The level of available nutrients for enhancing bacterial activity was monitored through analysis of soil samples. The aim is to achieve a Carbon: Nitrogen: Phosphorous ratio of 100:2.5:1. Generally if nutrient levels fell to a point that they were potentially inhibiting bacterial growth, urea and/or mono-ammonium phosphate (MAP) fertilizer was incorporated in the windrows using the twister bucket. Soil which had salinity parameters (electrical conductivity; EC) close to the acceptance guidelines was amended with fertilizer in phases, or not at all, to prevent creating a soil salinity issue. Additional MAP fertilizer was not deemed necessary to facilitate bioremediation in 2017, based on soil chemistry and removal efficiency to date.

An enhanced bioremediation trial initiated in 2014 on Windrows 22, 23, 24A/B and 25A/B continued throughout the 2015 and 2016 field seasons. The trial was designed to test use of surfactants and chemical oxidants to enhance treatment of petroleum hydrocarbon and polycyclic aromatic hydrocarbon impacted soils. Activities related to the enhanced bioremediation trial (i.e. treated soil monitoring) are on-going.

An estimated 2,827 m^3 of impacted material was contained within Biocell 1, and no soil was added during the 2017 field season. Approximately 371 m^3 of soil was processed in Biocell 2 to meet applied CCME Industrial

use guidelines, and was subsequently transferred for use as fill. The treated soil originated from the ARB excavation(s), and was used as backfill for the same area.

In 2017, fluid levels in the Biocells' sumps were monitoring weekly, at a minimum, or after significant rainfall events. Accumulated fluids were transported to the F-31X wastewater treatment and injection facility for disposal. An estimated total of 420 m^3 of fluids were removed from the combined Biocells sumps in 2017.

Biocell 1 contained an estimated 2,827 m^3 of impacted windrowed soil in varying stages of treatment, as of September 2017. Further treatment of these windrows will be undertaken in 2018 to meet Industrial guidelines. Impacted soils remaining in Biocell 1 were sourced from multiple remedial excavation sites including Q-06X, O-18X, I-20X, Q-14X, BIFP, WSY Bin 1, and E-33-1X.

Biocell 2 contained approximately 462 m^3 of impacted soil requiring further treatment and 750 m^3 of soil that is in temporary storage but not considered treatable. Soil remaining in Biocell 2 was sourced from Q-43X, O-43X, BIFP, and Battery #3.

Analytical results relating to Biocell operations are presented in Tables 14, 15 and 16.

4.4.3 F-31X Well Site

The F-31X site is situated northeast of the Land Terminal #3 (LT3) Satellite Building, between the Mackenzie River to the south and Bosworth Creek to the north. Four monitoring wells have historically been installed in the F-31X area to monitor groundwater conditions following a 1997 flowline release (Figure 4F, bottom left).

4.4.3.1 Groundwater Monitoring

Two monitoring wells were included as part of the 2017 monitoring program. One of these two wells was dry in 2017 and could not be sampled, while the second contained limited water and a full sample suite could not be obtained. Results of the 2017 sampling program are summarized below:

- field-measured parameters were not obtained from either well due to limited sample volume; and
- no guideline exceedances were observed in 2017.

Monitoring well locations are shown on Figure 4F.

4.4.4 G-32X Well Site

The G-32X well site is situated just east of the F-31X well site (Figure 4F bottom left), between the Mackenzie River docking peninsula to the south and Bosworth Creek to the north. Two monitoring wells were installed in the area to investigate a large pit which is visible on historic aerial photographs.

4.4.4.1 Groundwater Monitoring

One monitoring well was sampled as part of the 2017 monitoring program. Results of the 2017 sampling program are summarized below:

- the reported concentrations of total phenols, dissolved cadmium and dissolved copper exceeded the applied CCME FWAL guidelines.

The monitoring well location is shown on Figure 4F.

4.4.5 E-33X Well Site

The E-33X production well was spudded on July 20, 1942 and is situated to the north of the barge loading dock.

A Phase II ESA targeting various APECs identified across the Norman Wells site was conducted in 2009, and included a preliminary investigation of the E-33X well site. Three soil boreholes were advanced and sampled during this investigation. All analyzed samples/parameters returned results below the applicable guidelines. No field observations of hydrocarbon presence were noted.

In 2013, an electromagnetic survey at the E-33X well site was completed in order to identify potential areas of elevated terrain conductivity associated with the well and facilities. The survey identified a small area of elevated terrain conductivity to the north of the wellhead, but further investigation was not possible due to site constraints. A limited Phase II ESA including three delineation test pits was conducted in 2014, following the cut and cap abandonment of the former wellhead and two associated flow lines. Petroleum hydrocarbon concentrations were reported above the applied guidelines in soil sampled from within the wellhead excavation and the test pit to the southwest of the abandoned flow lines. A supplementary Phase II ESA including six boreholes to provide further delineation on identified impacts was completed in 2016.

In 2017, further supplementary Phase II ESA works were completed, as discussed below.

4.4.5.1 Phase II Environmental Site Assessment

2017 Phase II Supplementary ESA works included the advancement of six boreholes. These boreholes were intended to provide further delineation to the south and west of previously identified soil impacts. Guideline exceedances of pH, sodium adsorption ratio (SAR), PHC F1, F2, F3 and F4G, and/or arsenic were reported.

Borehole locations are shown on Figure 4D, and soils data are provided in Tables 9 to 12.

4.4.6 B-30X Well Site

Geophysical surveys (EM 38, 31 and 61) were completed over the B-30X well pad area in June 2012. The surveys identified several zones of terrain conductivity elevated above the interpreted background levels for this area. Elevated EM 38 terrain conductivity values were denoted west and north of the wellhead. The well was cut and capped in July 2012 and a Phase II ESA was completed. A supplementary Phase II ESA was conducted in 2013 to further identify and assess potential areas of impact to soil and groundwater. Petroleum hydrocarbon impacts are present in soils and groundwater around the former B-30X well site.

The B-30X area was selected for a CO_2 soil monitoring program in 2015. This program continued in 2016, and included the deployment of forced diffusion chambers and CO_2 traps in June and September.

2017 C&R activities included a supplementary Phase II ESA and groundwater monitoring.

4.4.6.1 Phase II Environmental Site Assessment

Six boreholes were advanced in the B-30X well site area in 2017, two of which (B30-17-4 and B30-17-5) were completed as monitoring wells. These boreholes were intended to provide additional delineation around impacts related to the abandoned B-30X well head and associated infrastructure. Guideline exceedances of PHC F3, F4G, and arsenic were reported.

Borehole locations are shown on Figure 4E, and soils data are provided in Tables 9 to 12.

4.4.6.2 Groundwater Monitoring

A total of seven B30 series monitoring wells are associated with the B-30X well site area, six of which were included during the annual 2017 groundwater monitoring program. The 2017 groundwater monitoring results are summarized as follows:

- groundwater surface elevations indicated that the hydraulic gradient was generally south and west towards Bosworth Creek. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost; and
- exceedances were observed at six monitoring wells for one or more parameters including total phenols (four wells), benzene (two wells), toluene (two wells), dissolved aluminum (one well), dissolved arsenic (two wells), dissolved cadmium (two wells), dissolved copper (two wells), dissolved iron (three wells), dissolved selenium (four wells), and dissolved uranium (four wells).

The two monitoring wells which were installed during the 2017 Phase II ESA works were monitored after the annual groundwater monitoring program was completed. The results of this sampling are summarized as follows:

- one of the two newly-installed monitoring wells contained insufficient water to sample in 2017; and
- no guideline exceedances were reported for the second groundwater monitoring well.

Monitoring well locations are shown on Figure 4F, and data are provided in Tables 1 to 7.

4.4.7 Well Services/Warehouse Yard (WSY)

Two monitoring wells were installed in the Well Services and Warehouse Yard in 1997. Petroleum hydrocarbon impacts in the vicinity of the former B-30X well head have also been identified up-gradient from this location in the WSY area. The two monitoring wells are peripheral to the yard and serve as sentinel monitoring points.

4.4.7.1 Groundwater Monitoring

- two WSY monitoring wells were sampled as part of the 2017 monitoring program;
- exceedances were observed at both monitoring wells for one or more parameters including total phenols (one well) dissolved arsenic (one well), dissolved iron (two wells), and dissolved selenium (one well).

Monitoring well locations are shown on Figure 4F, interspersed with B30-series wells described above.

4.4.8 C-30X/C-32X, Bosworth Creek and Bosworth Delta Area

Bosworth Creek effectively bisects the Mainland area from north to south, as illustrated on Figure 4A. The focus of Bosworth Creek C&R activities to date has been associated with the removal of a weir formerly located underneath the lower Bosworth Creek bridge. After the weir removal in 2005 and the subsequent drop in creek water levels, the focus shifted to creek bed and bank restoration activities and characterization of surface water quality, as well as fish habitat assessment.

In 2009, a surface water quality monitoring program was initiated in Bosworth Creek. In 2010, the fish habitat assessment was initiated in conjunction with the surface water sampling program. In 2011, surface water quality, fish habitat, and benthic invertebrates monitoring activities were continued. In 2012, only surface water quality monitoring was conducted. In 2013, the monitoring program was reduced to only include select locations.

Surface restoration activities on the east Bosworth Creek bank have been in progress since 2006, and have included soil characterization, debris and impacted soil removal, asbestos pipe wrap removal, and erosion control. In 2016 and 2017, visual assessments of previous slope stabilization and revegetation works were completed.

The C-30X well site is located approximately 100 m southwest of the Production Warehouse and 150 m north of Bosworth Creek (Figure 4F). Two historical flow line failures were reported in a 30 m stretch of line transporting crude oil and produced water from the C-30X well site to Land Terminal 11 (LT11) at the former Battery #3 area. The line failures occurred near the C-32X well site. The flow line release area south of the C-32X well was identified as an area of interest, and one groundwater monitoring well was installed in 2010. Groundwater and surface water monitoring downgradient of the release site continued in 2017.

A summary of the 2017 C&R activities is included below.

4.4.8.1 Groundwater and Surface Water Monitoring

The majority of groundwater monitoring wells installed historically on the Bosworth Delta and in the Bosworth Creek valley have been damaged or destroyed by seasonal ice break-up within a few years of installation, and many have been subsequently abandoned. A summary of the 2017 groundwater and surface water analytical results is provided below:

- one groundwater monitoring well (C30-10-1-5), four drive-points (BOS-DP-13 series) and one surface water monitoring location were sampled during the 2017 program (Figure 4F);
- the four drive points contained limited water and were not sampled for field-measured parameters;
- exceedances were observed at four monitoring locations for one or more parameters including chloride (one well and one drive point), total phenols (two wells), dissolved arsenic (one well and two drive points), dissolved iron (one well and two drive points), dissolved selenium (one well), anthracene (two drive points), benzo(a)anthracene (three drive points), benzo(a)pyrene (one drive point), fluoranthene (three drive points), naphthalene (one drive point) phenanthrene (two drive points), and pyrene (three drive points); and
- the reportable detection limit for total phenols was raised above the applied CCME FWAL guideline due to matrix interference in one sample.

Monitoring locations are shown on Figure 4F, and data are provided in Tables 1 to 7.

4.4.8.2 Bosworth Creek Enhancement

An erosional area was identified approximately 500 m upstream from the Mackenzie River. The area had been previously disturbed during historical flowline crossing construction, and by subsequent remedial activities on the east bank of Bosworth Creek. Site restoration efforts were initiated in 2009, including transplanting native trees and shrubs to expedite the growth of riparian vegetation and enhance the fish habitat in Bosworth Creek.

Revegetation activities were undertaken in 2009, 2012, and 2014-2016. Slope stabilization activities were conducted in 2014-2015, but have had limited success due to various factors including soil slumping.

Visual assessments of previous slope stabilization and re-vegetation works were completed in September 2016, during which several erosion control measures were identified as requiring maintenance to prevent further erosion and soil loss. A subsequent inspection in 2017 identified signs of soil instability, including slumping, erosion, and surface cracking. Silt fencing was identified as requiring maintenance in order to prevent future undercutting and erosion/soil loss. An assessment of revegetation success indicated encroachment of natural species, although the success rate of willow staking has proved to be poor at this location (Photo C).

Photo C Bosworth Creek East Bank Revegetation



4.4.9 Background/Control Point Locations (Mainland Central Background)

There are currently three monitoring wells installed across the Mainland Central area for the purpose of assessing background groundwater quality, one of which was dry in 2017 and could not be sampled. Both remaining locations (MCBG-10-1-3 and MCBG-12-1-2) were sampled in 2017 to supplement the background geochemistry database.

In 2017, exceedances were observed at two monitoring wells for one or more parameters including total phenols (two wells), dissolved cadmium (two wells), dissolved copper (two wells), dissolved iron (one well), dissolved uranium (one well), anthracene (one well), benzo(a)anthracene (one well), fluoranthene (one well), and pyrene (one well).

Well locations are shown on Figure 4F.

4.5 Mainland East

The Mainland East portion of the Site includes the land area bounded by the Town of Norman Wells on the east, the former Battery #3 site to the west, the Mackenzie River to the south, and the Site access ring road to the north (Figure 5A). The following areas within Mainland East were targeted for C&R works during 2017:

- Former Refinery Area (REF/NWR);
- Former Reduced Crude Flare Pit (RCFP);
- B-35X Well Site;
- B-38X Area, including the Former Fire Training Area (FTA), Land Terminal #7 area (LT7), and the area east of the B-38X Well Site;
- Mainland Tank Farm (MTF/TF);
- B-42X Well Site;
- C-36X Well Site;
- C-38X Well Site;
- Former Fuel Tanks and Former Campsite Areas (FT/CAB); and
- Background/Control Point Locations (MEBG).

The following subsections provide summaries for areas where C&R activities were undertaken in 2017. Related groundwater and surface water data are listed in Tables 1-7.

4.5.1 Former Refinery Area

The Norman Wells Refinery was located on the north bank of the Mackenzie River on the east side of the Norman Wells lease area (Figures 5A/B). It began operation in 1921, processing crude oil from the Norman Wells oilfield until May of 1996 when IOR announced that the refining facility would close. The Phase I and Phase II C&R Plans for the facility were submitted by IOR in 1998 and 1999, respectively, and were approved by the SLWB in 2001. Initial C&R work on the Refinery site began in 1996 with decommissioning and

dismantling activities, followed by environmental assessment, characterization and development of a remediation and reclamation plan. In 2002, soil remediation activities were initiated.

A groundwater containment system was commissioned and became operational in 2003, and a complementary in situ multiphase extraction (MPE) remediation system (described in Appendix 6) has been seasonally operational since 2004.

Both remediation systems were temporarily shut down beginning in February 2017 following the plant-wide shutdown due to the closure of the Enbridge pipeline. To ensure that temporary suspension of the remediation system would not have a deleterious effect on downgradient receptors, a sentinel network including eleven additional monitoring wells was installed between the former Refinery site and the Mackenzie River. In addition to the new monitoring wells, monitoring frequency at a number of key existing wells was increased from annually to monthly for the duration of the remediation system shutdown, beginning in March 2017.

A CSM has been developed for the Former Refinery Area, and is presented in Appendix 6.

4.5.1.1 2017 Status Update

The 2017 C&R program for the former Refinery site included the following activities:

- drilling and installation of a series of sentinel monitoring wells, situated between the leading edge of the plume of impacted groundwater and the Mackenzie River;
- monthly groundwater sampling at a selected subset of the monitoring wells at the Former Refinery Area beginning in March 2017, to monitor for potential downgradient migration of impacted groundwater following temporary remediation system shutdown;
- annual groundwater and surface water as per the standard annual monitoring program; and
- characterization of current groundwater conditions at the in situ remediation area on the Refinery Bank.

Related groundwater and surface water data are listed in Tables 1-7, while soils data for this area are provided in Tables 17 to 19.

Liquid hydrocarbons consisting of both refined light-end product and naturally-occurring crude oil seepage are present on the Refinery Bank. A total of twelve monitoring and remediation wells in this area contained measurable free-phase hydrocarbons during one or more of the 2017 field monitoring events.

4.5.1.2 Sentinel Monitoring Network Installation

In June 2017, eleven shallow monitoring wells (RB-MW17 series) were installed in the lower terrace and beach area to characterize groundwater conditions downgradient of the remediation system following temporary shutdown in February 2017. These wells were added to the network of wells which are being monitored on a monthly basis until the remediation systems are restarted.

4.5.1.3 Groundwater Monitoring

The monitoring well network and analytical schedule were further refined in 2017 as per Appendix A of the Water Licence. The annual groundwater monitoring program is primarily focused on groundwater sampling

for laboratory analyses and field parameter measurements. The 2017 groundwater sampling results are summarized as follows:

- currently, 12 monitoring wells are included in the annual groundwater program in the Former Refinery area (NWR series wells in Table 1), excluding the remediation system extraction and observation wells discussed above;
- four wells out of the 12 scheduled for regular annual monitoring were not sampled because three contained free-phase hydrocarbons, and one contained insufficient water to produce a sample;
- none of the eight shallow monitoring wells (RB-13 series, Table 1) installed during 2013 on the mud flats down-gradient of the MPE remediation area have exhibited any measurable LNAPL to date;
- groundwater flow is inferred to be generally southward towards the Mackenzie River. Three groundwater pumping wells for remediation purposes locally alter hydraulic gradients and flow direction immediately north of the fuel loading dock while the groundwater remediation system is active;
- nine monitoring wells had a field-measured pH value which fell outside of the acceptable CCME guideline range;
- exceedances were observed at seven monitoring wells for one or more parameters including chloride (six wells), nitrite (as N) (four wells), benzene (13 wells), toluene (14 wells), ethylbenzene (four wells), dissolved arsenic (four wells), dissolved iron (25 wells), dissolved selenium (two wells), anthracene (one well), fluoranthene (one well), naphthalene (one well), and pyrene (one well);
- the Refinery Bank area is well documented as an area of natural crude oil and saline water seepage. As such, the observed chloride in groundwater may be primarily from natural upward seepage of deeper saline groundwater;
- the reportable detection limit for nitrite (as N) was raised above the applied CCME FWAL guideline for two samples due to matrix interference; and
- the potential source(s) of polycyclic aromatic hydrocarbon (PAH) concentrations (i.e. natural hydrocarbon seepage and/or historical spills) are currently being evaluated.

Monitoring well locations are shown on Figures 5B and 5E. Additional details are provided in Appendix 6.

4.5.2 Former Reduced Crude Flare Pit (RCFP)

The former Reduced Crude Flare Pit is situated 100 m north of the Mainland Tank Farm. Four monitoring wells were installed around the RCFP in 1998, 1999, and 2003. A remedial excavation to remove salt and hydrocarbon impacted soils was completed in 2003. In 2004, the RCFP excavation was backfilled, re-contoured, and seeded with a seed mix developed for Norman Wells.

The 2017 C&R program for the RCFP site included the annual groundwater monitoring program.

4.5.2.1 Groundwater and Surface Water Monitoring

Two monitoring wells were included in the 2017 groundwater monitoring program (RCF series wells, Table 1). The results are summarized below.

- frozen soils (discontinuous permafrost) may locally influence groundwater flow, as current groundwater surface elevations are not indicative of a prevailing groundwater flow direction. Overall groundwater flow in the area is inferred to be south towards the Mackenzie River; and
- exceedances were observed at both monitoring wells during the 2017 groundwater sampling event for one or more parameters including dissolved cadmium (one well) and iron (one well).

Monitoring well locations are shown on Figure 5D.

4.5.3 B-35X Well Site

The B-35X well site is located south of the Flint Shop and former camp site, and directly east of Yard D. The B-35X well was spudded on July 4, 1982, and was completed as an injection well (Figure 5D, top left).

In 2012, electromagnetic geophysical surveys were completed at the B-35X well site in order to assess potential environmental impacts prior to infrastructure abandonment and wellhead cut and cap.

An excavation was completed around the B-35X wellhead during the cut and cap activities (July 2012). Six boreholes were drilled around the footprint of this excavation in August 2012, three of which were completed as groundwater monitoring wells.

4.5.3.1 Groundwater Monitoring

Three monitoring wells were installed around the cut-and-capped B-35X well in 2012, all of which were included in the 2017 groundwater sampling and analytical program for this area (B35X series wells, Table 1). The results are summarized below.

- frozen soils (discontinuous permafrost) may locally influence groundwater flow, as current groundwater surface elevations are not indicative of a prevailing groundwater flow direction. Overall groundwater flow in the area is inferred to be south towards the Mackenzie River; and
- exceedances were observed at three monitoring wells for one or more parameters including dissolved cadmium (two wells), dissolved iron (two wells), and dissolved uranium (one well).

Monitoring well locations are shown on Figure 5D.

4.5.4 B-38X/FTA Area

The B-38X well site is located approximately 200 m north of the former Refinery. The B-38X area includes the B-38X well site, the C-40X well site, the B-40X well site, the former Fire Training Area (FTA), a former buried pit west of the B-38X well, and the LT7 satellite building (Figures 5A and 5D).

Historical air photos and files indicate that this area was also the site of several large storage tanks (pre-1975). The B-38X well was one of the first wells drilled in Norman Wells; it produced from 1942 to 1957, when it was converted to a naphtha injection well. The B-38X well is currently an oil-producing well and is no longer used for injection purposes.

Initial assessment work on the B-38X site began in 1997 with environmental assessment and characterization, followed by development of a remediation and reclamation plan. In 2004, an in situ soil and groundwater treatment system (Dual Phase Extraction or DPE) was commissioned to the east of the B-38X well. In 2007, an

estimated 2,000 m^3 of hydrocarbon impacted soil was excavated from the B-38X buried pit area located 150 m west of the B-38X Well Site area. The impacted soil was transported to an on-site Biocell for treatment. The treated soil was subsequently tracked and re-used as industrial fill material on Site.

A CSM has been developed for the B-38X Area, and is presented in Appendix 7.

4.5.4.1 2017 Status Update

The 2017 C&R program for the B-38X site included groundwater monitoring and sampling. The results of this program are summarized below.

4.5.4.2 Groundwater Monitoring

Eleven monitoring wells were included in the 2017 groundwater sampling and analytical program for this area (B38 and FTA series wells, Table 1). The results are summarized below.

B-38X Well Site

- seven monitoring wells are associated with the B-38X well site area, two of which were dry and one of which contained free-phase hydrocarbons in 2017 and could not be sampled;
- groundwater surface elevations indicated that groundwater flow was generally southward towards the Mackenzie River. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost. While active, the remediation system in the area is expected to decrease the potential for lateral or vertical migration of impacted groundwater during the summer months; and
- exceedances were observed at four monitoring wells for one or more parameters including total phenols (one well), benzene (one well), dissolved arsenic (four wells), and dissolved iron (four wells).

Monitoring well locations are shown on Figure 5D.

Fire Training Area (FTA)

The current monitoring network in the FTA area includes four wells. One monitoring well could not be sampled as it contained free-phase hydrocarbons in 2017. Results of the sampling program are summarized below:

- exceedances were observed at three monitoring wells for one or more parameters including chloride (one well), benzene (three wells), toluene (three wells), ethylbenzene (one well), dissolved arsenic (one well), dissolved iron (one well), and dissolved selenium (one well).

Monitoring well locations are shown on Figure 5D.

4.5.5 Mainland Tank Farm (MTF/TF)

The Mainland Tank Farm is located northeast of the former Refinery site and west of the Town of Norman Wells (Figures 5A and 5D). The tank farm currently consists of 21 above-ground storage tanks (ASTs) of various sizes and contents within gravelled berms, and a ditch system to direct surface runoff to a holding pond south of the Mainland Tank Farm. Various environmental characterization activities have been

undertaken at the Mainland Tank Farm since 1997. A site inspection of the Mainland Tank Farm conducted in 2008 found it to be in good condition, with containment measures in place to mitigate environmental concerns.

4.5.5.1 Groundwater Monitoring

Nine monitoring wells within the Tank Farm area were included in the groundwater monitoring program. Results of the 2017 sampling program are summarized below:

- groundwater surface elevations indicated that groundwater flow was generally southward towards the Mackenzie River. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost;
- one monitoring well had a field-measured pH value which fell outside of the acceptable CCME guideline range; and
- exceedances were observed at nine monitoring wells for one or more parameters including chloride (three wells), nitrate (as N) (one well), total phenols (five wells), benzene (four wells), toluene (three wells), ethylbenzene (two wells), dissolved arsenic (six wells), dissolved cadmium (two wells), dissolved iron (seven wells), dissolved molybdenum (one well), dissolved lead (two wells), dissolved selenium (five wells), dissolved thallium (one well), and dissolved uranium (two wells).

Monitoring well locations are shown on Figure 5D.

4.5.6 B-42X Well Site

The B-42X well site is located on the south side of the Mainland Tank Farm near the Former Mainland Water Flood Pond (Figures 5A and 5C). The B-42X well was spudded on November 15, 1944. Based on National Energy Board (NEB) Well Records reviewed in 2008, B-42X was most recently used for injection purposes.

An initial site assessment was conducted in 2006, including six test pits around the wellhead. These test pits identified elevated hydrocarbon concentrations potentially associated with the utilidor which borders the well site to the south, or a former barrel storage yard which was situated across the site access road to the east. In 2010, three additional boreholes were drilled around the lease to further delineate the extent of the hydrocarbon impacts.

In 2013, electromagnetic geophysical surveys were completed around the B-42x wellhead and lease. These surveys identified three elevated conductivity features around the lease, all of which appeared to be associated with site infrastructure.

The wellhead and associated above- and below-ground infrastructure was abandoned in 2015. The well was cut and capped, and three test pits were completed around the associated excavation footprint. Elevated hydrocarbon concentrations were reported adjacent the wellhead, south of the wellhead (adjacent the site access road), and east of the wellhead.

A supplementary Phase II ESA was completed at the B-42X well site in September 2017, which included the installation of three groundwater monitoring wells. These wells were subsequently sampled in October 2017. Both programs are discussed below.

4.5.6.1 Phase II Environmental Site Assessment

Seven boreholes were advanced around the B-42X well site in 2017, three of which were completed as shallow groundwater monitoring wells. Soil samples collected from boreholes to the west, southwest and southeast of the former wellhead returned guideline exceedances for petroleum hydrocarbons, arsenic, chromium, molybdenum, selenium and/or thallium.

Borehole locations are shown on Figure 5C.

4.5.6.2 Groundwater Monitoring

The three monitoring wells installed in September 2017 were sampled in October 2017. All three of the wells returned above-guideline concentrations of dissolved iron.

4.5.7 C-36X Well Site

The C-36X well site is located approximately 250 m west of the B-38X well site (Figure 5D). A review of historical aerial photographs and interviews with Imperial personnel indicated that the C-36X area was possibly used as a dump site, in addition to records of a historical well blowout. Four monitoring wells have been installed south of the C-36X well pad since 2009.

4.5.7.1 Groundwater and Surface Water Monitoring

Four monitoring wells and one surface water sampling location were included as part of the 2017 monitoring program. Results of the program are summarized below:

- groundwater surface elevations indicated that groundwater flow was generally southeast towards the Mackenzie River. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost;
- one monitoring well had a field-measured pH value which fell outside of the acceptable CCME guideline range; and
- exceedances were observed at all four monitoring wells and the surface water location for one or more parameters, including total phenols (two wells and one surface water location), benzene (one well), toluene (one well), dissolved arsenic (two wells), dissolved cadmium (one well), dissolved iron (four wells and one surface water location), dissolved selenium (one well), dissolved uranium (one well), and total arsenic, total cadmium and total iron (one surface water location).

Monitoring locations are shown on Figure 5D.

4.5.8 C-38X Well Site

The C-38X well site is situated about 200 m southwest of the B-38X well site. In 1998, a single borehole was advanced within the well pad, and elevated hydrocarbon concentrations were identified at approximately 2-3 metres below ground surface (mbgs).

In 2005, a produced water release occurred at Line 405, west of the C-38X well pad. The area was excavated to 2 mbgs and residual soils met Industrial land use guidelines. In 2008, one borehole was advanced to the west

of the C-38X well site to monitor soil quality in proximity to the remediated area. This borehole was completed as a monitoring well.

4.5.8.1 Groundwater Monitoring

One monitoring well in the C-38X Well Site area was included in the groundwater monitoring program, Results of the 2017 sampling program are summarized below:

- groundwater surface elevations indicated that groundwater flow was generally southward towards the Mackenzie River. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost;
- the field-measured pH value was below the FWAL guideline range; and
- exceedances were observed at the monitoring well for total phenols, dissolved aluminum, dissolved arsenic, dissolved iron, and dissolved selenium.

The monitoring well location is shown on Figure 5D.

4.5.9 Former Fuel Tanks and Former Camp Area (FT/CAB)

A former construction camp site (CAB) exists east of the Frontier Warehouse/Flint Shop (FT; Figure 5D, top left). This area is currently used as a laydown area and for equipment/vehicle parking. Three groundwater monitoring wells were installed adjacent to the CAB site area in 2009.

Two above-ground fuel storage tanks, an underground flow line, and a fuelling station were formerly situated west of the Frontier Warehouse/Flint Shop. These fuel tanks have since been decommissioned and removed, and two monitoring wells were installed in 2010.

4.5.9.1 Groundwater Monitoring

One monitoring well in the CAB site and one monitoring well in the FT site were included and sampled in the 2017 groundwater monitoring program. Results of the sampling program are summarized below:

- exceedances were observed at both monitoring wells for one or more parameters including dissolved iron (one well) and dissolved selenium (one well).

Monitoring well locations are shown on Figure 5D.

4.5.10 Background/Control Point Locations (MEBG)

Several locations have been selected across the Mainland East area to provide data representative of background conditions for soil and shallow groundwater. These locations are abbreviated as MEBG (Mainland East Background). Other interpreted background locations for the area are listed in Appendix 3.

Three background wells in Mainland East were sampled in 2017 (MEBG-10-1-3, MEBG-12-2-3, and MEBG-15-4-3). Exceedances were observed at all three monitoring wells for one or more parameters including total phenols (two wells), dissolved cadmium (one well), dissolved copper (one well), dissolved iron (two wells), anthracene (one well), benzo(a)anthracene (one well), fluoranthene (two wells), naphthalene (one well), phenanthrene (one well), and pyrene (two wells).

Monitoring well locations are shown on Figure 5D.

4.6 Sumps

There are three former sump areas on the Mainland that were assessed as part of the 2017 C&R program.

Environmental assessment activities to date at the various sump sites have included soil sampling by drilling and test pitting, installation and sampling of groundwater monitoring wells, surface water sampling at ponded areas on the capped sumps, and draining, backfilling and regrading of collapsed cap areas.

Mainland area sumps included in the C&R program are as follows:

- Mainland Sumps (Figure 6A/B); an area which collectively includes the Mainland Drilling Sump (MDS), Well Services Sump (WSS), and six other drilling waste sumps (Sumps 1-6);
- Cemetery Sump (Figures 3A/B); and
- C-27X Sump (Figures 3A/B).

Related groundwater and surface water data are listed in Tables 1-7.

4.6.1 Mainland Sumps

The Mainland Sumps area is located on the northern side of the Imperial Site ring road. The sumps were historically used for disposal of drilling or well services waste. These have been assessed as three sub-areas: the Mainland Drilling Sump, the Well Services Sump and the Closed Mainland Sumps (Figure 6A).

In 2008, the Mainland Drilling Sump was dewatered and the remaining sump solid material was encapsulated within liners. The sump was backfilled, capped and re-contoured. Also in 2008, the Well Services Sump was excavated and waste material was disposed of off-site. The excavation was then backfilled, and re-contoured.

In 2013, Sump 1 was drained of water and backfilled with treated soil sourced from Biocell 1. In 2014, dewatering and sump capping works continued, with material being placed in depression areas at Sumps 2, 3, 4, and 5. In 2015, further dewatering, backfilling, capping and contouring was completed at Sumps 2, 4, and 5, as well as supplemental soil sampling and groundwater and surface water sampling. Further dewatering was completed at Sumps 1, 3 and 5 in 2016, and Sump 5 was contoured to emulate pre-disturbance conditions to ensure positive drainage away from the sump area.

A CSM has been developed for the Mainland Sumps area, and is presented in Appendix 8.

2017 C&R works included groundwater and surface water monitoring.

4.6.1.1 Groundwater and Surface Water Monitoring

Mainland Drilling Sump Area

The 2017 groundwater monitoring program at the former MDS included five wells. A summary of the 2017 findings includes:

- one groundwater well (MLS-14-9-3) was inaccessible due to standing water around the well standpipe. A surface water sample (MLS-14-9-SW) was collected at the location of the inaccessible well.
- shallow groundwater flow is interpreted to be relatively stagnant;
- exceedances were observed at the four monitoring wells and surface water location for one or more parameters including chloride (four wells), total phenols (one well and three surface water locations), dissolved boron (two wells), dissolved cadmium (one well), dissolved copper (one well), dissolved iron (one well and one surface water location), dissolved uranium (one well) and total iron (one surface water location); and
- The reportable detection limit for dissolved iron was raised above the applied CCME FWAL guideline for one sample due to matrix interference.

Monitoring locations are shown on Figure 6B.

Well Services Sump Area

The 2017 groundwater monitoring program at the former WSS included eight wells. A summary of the 2017 findings includes:

- shallow groundwater flow is interpreted to be relatively stagnant in the vicinity of the Mainland Sumps;
- field-measured pH values from all monitoring wells were within the FWAL guideline range (CCME 2015) except at one location (MLS 09-9-2);
- exceedances were observed at all eight monitoring wells for one or more parameters including chloride (seven wells), total phenols (two wells), dissolved arsenic (one well), dissolved boron (two wells), dissolved cadmium (one well), dissolved iron (four wells), and dissolved selenium (one well); and
- The reportable detection limit for nitrite (as N) was raised above the applied CCME FWAL guideline for four samples due to matrix interference;.

Monitoring locations are shown on Figure 6B.

Sumps 1 Through 6

Fourteen monitoring wells and three surface water monitoring locations were included as part of the 2017 analytical schedule for Mainland Sumps 1 through 6. One well (MLS 09-7-2) could not be located. Water sampling results are summarized as follows:

- in 2017, three wells (MLS-14-3-3, MLS-14-4-3, and MLS-14-8-3) were inaccessible due to standing water around the risers. Surface water samples were collected in lieu of groundwater samples at the locations of the inaccessible wells;
- shallow groundwater flow is interpreted to be relatively stagnant in the vicinity of the Mainland Sumps. Due to variable frost-jacking observed at most monitoring wells in 2016, calculated groundwater surface elevations cannot be reliably compared between wells to determine a lateral hydraulic gradient and/or flow direction;

- exceedances were observed at ten monitoring wells and four surface water locations for one or more parameters including chloride (seven wells), total phenols (two wells and three surface water locations), toluene (one well), dissolved aluminum (one well), dissolved arsenic (one well), dissolved cadmium (two wells), dissolved chromium (one surface water location), dissolved copper (two wells), dissolved iron (three wells and one surface water location), dissolved uranium (one well), dissolved zinc (one well), total aluminum (one surface water location), total iron (three surface water locations), and total zinc (one surface water location); and
- the reportable detection limit for nitrite (as N) was raised above the applied CCME FWAL guideline for three samples due to matrix interference.

Monitoring locations are shown on Figure 6B.

4.6.2 Cemetery Sump

The Cemetery Sump is located to the west of the CPF and approximately 100 m northwest of the Town of Norman Wells cemetery (Figure 3A). Site investigations including geophysical surveys and soil and groundwater sampling programs were conducted in this area between 1998 and 2010, with results indicating the presence of soil EC, chloride and petroleum hydrocarbon concentrations above CCME industrial land use guidelines and/or expected background conditions to an average depth of 3.0 to 4.0 mbgs.

A supplementary Phase II ESA was completed in 2009, including 13 shallow boreholes, four shallow monitoring wells and one deep bedrock monitoring well. Lateral delineation of identified soil impacts was achieved to the north, south, west and east of the Sump. A screening level risk assessment (SLRA) for the Sump was undertaken in 2010 to determine optimal future management options. The sump was re-contoured, capped and seeded in 2010.

In 2013, a supplementary geophysical assessment of the Cemetery Sump area was completed. This information guided a subsequent Phase II ESA, which included five additional borehole locations, four of which were completed as monitoring wells and one of which was completed as a thermistor to assess local permafrost conditions.

A review of historical aerial photographs indicated that two ASTs of unknown volume and contents were situated at the western edge of the Cemetery Sump area during 1987. A Phase II ESA targeting this former tank storage area was completed in 2016, but no guideline exceedances of note were identified.

In 2017, C&R activities in the Cemetery Sump area included groundwater monitoring, which is summarized below.

4.6.2.1 Groundwater Monitoring

The 2017 groundwater monitoring program at the closed Cemetery Sump included four wells in and around the sump (CEM series). These wells were all dry or contained insufficient water to provide samples in 2017.

Monitoring well locations are shown on Figure 3B.

4.6.3 C-27X Sump

The C-27X sump, previously known as the CPF Sump, is located north of the C-27X injection well and west of Bosworth Creek (Figure 3A). This sump is visible on aerial photographs from 1979 to 1983, having an approximate footprint of 50 m by 50 m. Geophysical surveys conducted in 2005 indicated that a conductive anomaly is present in the southern portion of the survey area, and that any inorganic impact potentially associated with the sump is likely to exceed depths of 1 mbgs. In 2008 and 2009, investigations (geophysical surveys, soil and groundwater sampling) around the sump identified above background terrain conductivity values throughout the central portion of the survey area. During 2015, the collapsed portion of the sump was dewatered and partially filled.

In 2016, the sump was capped and a supplementary Phase II was completed, including installation of down-gradient monitoring wells and further delineation of existing impacts.

In 2017, C&R works in the C-27X Sump area included groundwater monitoring.

4.6.3.1 Groundwater Monitoring

The 2017 groundwater sampling program results are summarized as follows:

- of the five groundwater monitoring locations (C27 series wells in Table 1) included in the 2017 program, two wells were dry and could not be sampled;
- based on topography, groundwater flow is expected to be eastward toward the Bosworth Creek valley. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost; and
- guideline exceedances were observed at three monitoring wells for one or more parameters including total phenols (two wells), dissolved iron (one well), cadmium (two wells), copper (one well), and uranium (two wells).

Monitoring well locations are shown on Figure 3B.

4.7 Bear Island

Bear Island and Frenchy's Island (Figure 7A) are two of three natural islands included in the IOR Norman Wells Site. Bear Island is located adjacent to the south bank of the Mackenzie River and is accessible by boat or barge in summer, ice road in winter or helicopter for the remainder of the year.

Geophysical surveys, soil and/or groundwater sampling have been conducted at the Bear Island target areas noted below to date. The primary Bear Island work areas are shown on Figures 2 and 7A.

- Bear Island 1X Drill Pad (BI1/BIDP);
- Bear Island former tank area now referred to as BT1 (BIBT1);
- Bear Island West Sumps (Sumps 1-5);
- Former Tanks south of R-36X Well Site;
- Bear Island Flare Pit (BIFP);

- Former Bear Island Battery and N-42X Well Site (BIN42/BIB);
- Former Flow Line Release near N-44X, N-45X, and O-46X;
- Bear Island East Sump (Sump 6); and
- Background Locations/Control Points (BIBG).

C&R work in 2017 for Bear Island included further Phase II ESA investigations and groundwater and surface water sampling, as summarized in the following sections. Related groundwater and surface water data are listed in Tables 1-7, while soils data are provided in Tables 20 to 23.

4.7.1 Bear Island 1X Drill Pad

During file and historical air photo reviews conducted in 2008-2009, the Bear Island #1 well site was identified as an area of historic environmental disturbance. In 2010, the site was inspected to determine the current ground conditions. The inspection indicated that the well had not been properly abandoned, and the well casing had been exposed through erosion of the Mackenzie River bank. Opportunistic soil grab sampling was completed at the time of the inspection and confirmed the presence of hydrocarbons above the applied regulatory guidelines. In 2011, the well lease access road and pad area were reconstructed to facilitate proper well abandonment and cut and cap. In 2012, geophysical surveys and a Phase II ESA were completed to assess the extent of the identified impacts. The ESA included the advancement of 11 soils boreholes, three of which were completed as groundwater monitoring wells.

2017 C&R activities at the Bear Island 1X Drill Pad included groundwater monitoring.

4.7.1.1 Groundwater Monitoring

Three monitoring wells were installed near the former Bear Island #1 well site in 2012. Two of these wells were included in the 2017 monitoring program, but both wells were dry or frozen and could not be sampled.

Monitoring well locations are shown in Figure 7E.

4.7.2 Bear Island BT1

Previous investigations in the BIBT1 area identified approximately 5,000 m^3 of hydrocarbon impacted soil and localized groundwater impacts. Remedial excavation activities were initiated in 2014 and are being completed in stages. In 2014, approximately 1,115 m^3 of impacted soil was excavated and stockpiled. In 2015, an additional 3,110 m^3 of impacted soil was excavated and transported to the temporary holding cell at BIT5. Confirmatory soil samples from the excavation base and all sidewalls except in the northeast and east corner of the site indicate PHC, PAH, EC and/or SAR concentrations exceeding the applied Residential/Parkland guidelines. A high water table and adjacent active road bed limited excavation extents and depth in 2014 and 2015.

In 2016, a Phase II ESA was completed at BIBT1, including the advancement of thirteen boreholes, three of which were completed as groundwater monitoring wells.

A CSM has been developed for the Bear Island BT1 site, and is presented in Appendix 9.

C&R work in 2017 around BIBT1 included a supplemental Phase II ESA investigation and groundwater monitoring, as summarized below.

4.7.2.1 Phase II Environmental Site Assessment

The 2017 Phase II ESA was intended to further characterize soil conditions and improve impact delineation at BIBT1. The ESA included the advancement of three boreholes. One of the three boreholes returned guideline exceedances for petroleum hydrocarbons.

Borehole locations are shown on Figure 7B.

4.7.2.2 Groundwater Monitoring

Eleven groundwater wells were included in the 2017 groundwater monitoring program for the BIBT1 area. One of the wells was destroyed by ice during the spring breakup, and could not be sampled. The remaining monitoring locations were sampled in 2017 and results are summarized below.

- groundwater is inferred to flow predominantly towards the Mackenzie River. Groundwater flow occurs seasonally within the active layer overlying permafrost; and
- exceedances were noted at all ten of the wells for one or more parameters including chloride (one well), phenols (six wells), benzene (two wells), toluene (two wells), ethylbenzene (one well), arsenic (two wells), cadmium (five wells), copper (one well), iron (nine wells), selenium (one well), uranium (two well), and zinc (three wells).

Monitoring well locations are shown in Figure 7E.

4.7.3 Bear Island West Sumps (Sumps 1-5)

The Bear Island West Sumps area includes a series of historical capped drilling waste sumps (#1 through #5), located on the north western side of Bear Island (Figure 7A). Between 1997 and 2014, numerous environmental sampling programs have been completed in and around the Sumps, including Phase I site assessments, a screening level risk assessment (SRLA), geophysical surveys, soil sampling, monitoring well installations, and groundwater and surface water sampling.

In 2010, seven boreholes were advanced and five groundwater monitoring wells were installed to provide additional characterization and impact delineation. The soil analytical results confirmed the presence of EC, SAR, benzene, PHC F1, F2, and F3 concentrations exceeding guidelines within the capped sumps. In addition, concentrations of several metals parameters which are known constituents of drilling mud (barium, lead, zinc) also exceeded the applied guidelines. Multiple groundwater parameter concentrations exceeded the CCME FWAL guidelines, including pH, phenols, benzene, toluene and ethylbenzene.

In 2013 and 2014, three boreholes and four test pits were advanced, with monitoring wells being completed at all seven locations. All locations had soil concentrations that exceeded the applied guideline for either EC or PHC-F2. The dominant soil type at the Sumps was classified as fine-grained.

A Phase II ESA conducted in 2015 included soil sampling at fourteen boreholes and reported guideline exceedances of EC and petroleum hydrocarbons. In 2016, a supplementary Phase II ESA was completed,

including fourteen boreholes, six of which were completed as monitoring wells and one of which was completed as a thermistor, and the collection of thirteen sump solids samples. Exceedances of salinity parameters, petroleum hydrocarbons, and total barium were reported in soils around the Sumps area.

A CSM has been developed for the Bear Island West Sumps (#1 to 5) and East Sump (#6), and is presented in Appendix 10.

C&R work in 2017 around the Bear Island West Sumps included groundwater and surface water sampling, as summarized below.

4.7.3.1 Groundwater and Surface Water Monitoring

The current monitoring network for the Bear Island West Sumps includes twelve wells, two drive points, and six surface water sampling locations. Of these, three wells were dry and one well could not be located in 2017. Subsequently, these wells could not be sampled. Results of the sampling program are summarized below.

- groundwater is inferred to flow predominantly towards the Mackenzie River, with localized flow towards the sumps and unnamed surface water body to the south. Groundwater flow occurs seasonally within the active layer overlying permafrost; and
- exceedances were observed at eight monitoring wells, one drive point and six surface water locations for one or more parameters including chloride (five wells, one drive point and five surface water locations), total phenols (seven wells and one surface water location), benzene (two wells), toluene (two wells), ethylbenzene (two wells), dissolved arsenic (three wells), dissolved cadmium (four wells), dissolved copper (one well) dissolved iron (eight wells), dissolved selenium (three wells), dissolved uranium (two wells), and total aluminum, total arsenic, total cadmium, total chromium, total copper, total iron, total lead, total selenium, and total zinc (one surface water location).

Monitoring well and surface water sampling locations are shown in Figure 7E.

4.7.4 Former Tanks South of R-36X Well Site

The former tank farm site was identified as an Area of Potential Environmental Concern (APEC) during a review of historical aerial photographs as part of a Phase I update in 2008-2009. Two ASTs were evident in a historical aerial photograph from circa 1945. In 2015, two preliminary test pits were advanced near the site of the former ASTs. One of the two test pits returned concentrations of petroleum hydrocarbon parameters which exceeded the applied soils guidelines.

In 2016, a preliminary Phase II ESA was completed around the former AST locations, including the advancement of nine boreholes, five of which were completed as groundwater monitoring wells. Seven boreholes returned soil conductivity results which exceeded the applied soil guideline. Four of the boreholes returned concentrations of petroleum hydrocarbons which exceeded the applied soils guidelines.

4.7.4.1 Groundwater Monitoring

Five monitoring wells were installed at the historical tank site. These wells could not be safely accessed during 2017, and were subsequently not monitored. Monitoring well locations are shown in Figure 7E.

4.7.5 Bear Island Flare Pit (BIFP)

The BIFP is situated downslope from the former Bear Island battery site, near the current N-Pad location (Figures 7A/C). The flare pit was historically connected to the battery site by a flare line. As the flare pit had not been used since at least 1993, the site was supporting a heavy vegetation cover comprising primarily willows, alders, grasses and shrubs. A pipeline corridor consisting of eight buried lines running north-south intersects the site. A creek runs along the eastern and northern extents of the site. The overall topography slopes gradually down from the flare pit towards the Mackenzie River, approximately 120 m to the north; the distance to the river varies with seasonal water levels. The site is located along the north-central portion of Bear Island, and may be subject to ice scouring and/or flooding during the Mackenzie River spring break-up.

In 2011, geophysical investigations including terrain conductivity, magnetic, and electrical resistivity surveys were completed across the BIFP site to help guide subsequent intrusive works. A single test pit was excavated to provide preliminary soil characterization.

In 2012, six boreholes were advanced, three of which were completed as groundwater monitoring wells. Soils guideline exceedances of petroleum hydrocarbons and sodium adsorption ratio were reported.

In 2014, a remedial action plan (RAP) was developed to address contaminant source removal. Approximately 527 m^3 of impacted material was excavated and removed to an approved landfill, approximately 327 m^3 of impacted material was excavated and stored in a temporary containment cell at BIT5, and approximately 320 m^3 of impacted material was excavated and moved to Mainland Biocell 1 for on-site treatment. Residual hydrocarbon and PAH impacts were left at the southeast and southwest perimeter of the excavated area. Six test pits were completed south of the excavation boundary, confirming residual impacts to the southeast. A liner was placed over areas of residual impact prior to backfilling the excavated area with clean fill.

In March 2016, a supplementary Phase II ESA was completed around the former Flare Pit area, including four test pits, one of which returned petroleum hydrocarbon concentrations exceeding the applied soil guidelines. In September-October 2016, an additional Phase II ESA was completed, including nineteen boreholes (three of which were completed manually using a hand auger along the northeast boundary of the site at the edge of the adjacent creek), with three boreholes completed as groundwater monitoring wells. Reported exceedances included SAR, petroleum hydrocarbon parameters, arsenic, and PAHs.

A CSM has been developed for the Bear Island Flare Pit, and is presented in Appendix 11.

C&R works in 2017 around the BIFP included a supplementary Phase II ESA investigation, groundwater and surface water sampling, as summarized below.

4.7.5.1 Phase II Environmental Site Assessment

A supplementary Phase II ESA was completed at the Bear Island Flare Pit in 2017. This program included the advancement of nine boreholes, with one completed as a groundwater monitoring well (Figure 7C). One borehole returned an above-guideline soil conductivity result, while the rest of the submitted soils samples were below the applied guidelines for all parameters.

4.7.5.2 Groundwater and Surface Water Monitoring

Three monitoring wells and three surface water locations were included in the 2017 analytical program for the east-central area of Bear Island, down-gradient (north) of the former Bear Island Flare Pit. One of the monitoring wells was not sampled in 2017. Results from the sampling program are summarized below.

- groundwater is inferred to flow predominantly towards the Mackenzie River, with localized flow towards the unnamed creek to the east and north; and
- exceedances were observed at two monitoring wells and three surface water monitoring locations for one or more parameters, including phenols (two wells and two surface water locations), dissolved molybdenum (one well), dissolved uranium (one well), total aluminum (one surface water location), total arsenic (one surface water location), total cadmium (one surface water location), and total iron (three surface water locations).

Additional groundwater and surface water sampling was completed as part of the Phase II ESA during September-October 2017, including one newly-installed monitoring well and four surface water monitoring locations, two of which were also new for 2017. The results of this monitoring program included:

- the field-measured pH value for the monitoring well fell outside of the acceptability range per the CCME FWAL guidelines; and
- exceedances were observed at 1 monitoring wells and 4 surface water monitoring locations for one or more parameters, including dissolved iron (1 well and 1 surface water location), total aluminum (2 surface water locations), total arsenic (1 surface water location), total cadmium (2 surface water locations), total copper (1 surface water location), total iron (4 surface water locations), and total zinc (1 surface water location).

The groundwater and surface water monitoring locations are shown in Figure 7E.

4.7.6 Former Bear Island Battery and N-42X Well Site

The area of interest is located south of the N-42X well head and was the historic location of a tank farm associated with the former Bear Island Battery. This location was identified during a Phase I ESA and subsequent Phase II investigations in 1998 and 2008 as having concentrations of salts and hydrocarbons exceeding the applied guidelines in proximity to the former Battery.

In 2009, this area was investigated with the advancement of one shallow borehole and one groundwater monitoring well. Additional sampling was precluded by the presence of drilling camp infrastructure on the site. Soil analytical data confirmed EC values above the applied CCME guideline.

In 2010, five boreholes were advanced around the N-42X well site to further characterize and delineate soils impacts, two of which were completed as groundwater monitoring wells. Salinity and/or hydrocarbon exceedances were observed at all five locations.

In 2017, C&R works included ongoing groundwater and surface water monitoring, and are summarized in the following section.

4.7.6.1 Groundwater and Surface Water Monitoring

Three groundwater wells are currently monitored around the former battery and current N-42X well site. In 2017, only two of these wells contained sufficient water to sample. A surface water sample was collected from the unnamed creek adjacent to the N-42X well site. Results of the program are summarized below.

- groundwater is inferred to flow predominantly towards the Mackenzie River, with localized flow towards the unnamed creek. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost;
- the field-measured pH value for one monitoring well fell outside of the acceptability range per the CCME FWAL guidelines; and
- exceedances were observed at two monitoring wells and one surface water monitoring location for one or more parameters, including chloride (one well), phenols (one well and one surface water location), dissolved arsenic (one well), dissolved iron (two wells), total aluminum (one surface water location), and total iron (1 surface water location).

Monitoring well locations are shown in Figure 7E.

4.7.7 Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites

Four soil boreholes were advanced by hand auger and two drive-point monitoring wells were installed in a low-lying wetland area to the east of the N-44X well site in 2009 (referred to as Bear Island Spill Site 2: BISS2). This area was selected for investigation based on results of the Phase I ESA completed in 2008, which identified the area as being downgradient of a former spill site related to a flow line break near BIT#4. No soils or groundwater guideline exceedances were noted during the investigation.

Three soil boreholes were advanced by hand auger and two drive-point monitoring wells were installed within a localized depression north of the O-46X well site in 2009 (referred to as Bear Island Spill Site 3: BISS3). This location was selected for investigation based on the results of the 2008 Phase I ESA, which identified the area as being down-gradient of a former spill site related to a flow line break near BIT #4, as well as adjacent to the O-46X well site, which was also identified as a previous spill site. Free-phase hydrocarbons have also been historically observed in the peat layer in a wetland north of the O-46X well site. One of the hand auger locations returned above-guideline results for petroleum hydrocarbons. The geochemical data collected indicated that the flowline carried hydrocarbons (crude oil) but no saline produced water.

In addition, two soil boreholes were also advanced by hand auger adjacent the O-46X well site and one groundwater monitoring drive point was installed. Elevated EC readings exceeding the applied soils guideline were reported in both of the hand auger locations.

2017 C&R activities in these areas included groundwater monitoring.

4.7.7.1 Groundwater Monitoring

All five drive-points were sampled during the 2017 monitoring program, and the results are summarized below.

- groundwater is inferred to flow predominantly westward towards an unnamed lake. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost; and
- exceedances were observed at all five drive points for one or more parameters, including dissolved iron (four drive points), phenols (five drive points), arsenic (two drive points), and cadmium (two drive points).

Drive-point well locations are shown in Figure 7E.

4.7.8 Bear Island East Sump (Sump 6)

Bear Island Sump 6 (East Sump) is located on the east end of the developed portion of Bear Island, and is adjacent to the M-50X well pad (Figures 7A/D). There is no current infrastructure on the island further east of this Sump. The Sump is surrounded by conifer forest to the east and south, and by thick willows to the north, where the topography slopes down towards a wetland located approximately 50 m to the north. There is another wetland situated approximately 50 m to the south. A channel of the Mackenzie River that runs between Bear Island and Frenchy's Island is located approximately 250 m north of the Sump.

In 2016, a supplementary Phase II ESA was completed at Sump 6, which included the advancement of nine boreholes, one of which was completed as a groundwater monitoring well. Guideline exceedances for soil EC were reported at eight of the nine borehole locations, and petroleum hydrocarbon exceedances were reported at two locations.

A CSM has been developed for the Bear Island Sumps (including the Bear Island East Sump), and is presented in Appendix 10.

C&R work in 2017 at Bear Island East Sump included a supplementary Phase II ESA investigation and groundwater and surface water sampling, as summarized below.

4.7.8.1 Phase II Environmental Site Assessment

The 2017 Phase II ESA activities included the advancement of five boreholes to improve impact delineation around and within the Sump. Guideline exceedances were reported for soil EC, SAR, petroleum hydrocarbons, and barium.

4.7.8.2 Groundwater and Surface Water Monitoring

Six groundwater wells and one surface water location were included in the 2017 monitoring program. One of these wells was dry and could not be sampled in 2017. Results are summarized below.

- groundwater is inferred to flow predominantly northeast towards the Mackenzie River, with localized flow towards an unnamed lake north of the sump. Groundwater flow in this vicinity occurs seasonally within the active layer overlying permafrost; and
- exceedances were observed at five monitoring wells and one surface water location for one or more parameters including chloride (two wells), total phenols (four wells and one surface water location), dissolved arsenic (one well), dissolved cadmium (three wells), dissolved iron (five wells and one surface

water location), dissolved selenium (two wells), and total aluminum and total iron (one surface water location).

Monitoring well locations are shown in Figure 7E.

4.7.9 Bear Island Background/Control Points (BIBG)

Three monitoring wells are included in the analytical schedule in order to assess background hydrochemistry in the Bear Island area. One of these wells was damaged (blocked below ground surface) in 2017 and could not be sampled. Results of the monitoring program are presented below.

- the field-measured pH value reported at one monitoring location fell outside of the acceptability range per the CCME FWAL guidelines; and
- exceedances were observed at two monitoring wells for one or more parameters including total phenols (one well), dissolved cadmium (two wells), dissolved copper (one well) and dissolved selenium (one well).

Well locations are shown on Figure 7E.

4.8 Goose Island

Goose Island (Figure 8A) is the third natural island included in the Norman Wells site. Goose Island is seasonally inundated with river ice and water. Vehicle access is typically limited to a few months each year.

The 2017 C&R program for Goose Island included the following activities:

- supplemental Phase II ESA at the O-29X Well Site; and
- annual groundwater and surface water monitoring program.

Results of these programs are summarized below. Additional groundwater monitoring activities were undertaken at the O-18X site, and are reported under separate cover.

4.8.1 Phase II Environmental Site Assessment

One soil borehole was advanced at the O-29X well site in 2017 (Figure 8B). This location was intended to provide delineation of impacts related to the former wellhead and associated infrastructure, which was abandoned and cut/capped in 2014. This borehole identified petroleum hydrocarbons, molybdenum, aluminum and selenium concentrations exceeding the applied soils guidelines at depths up to 1.5 mbgs.

Two additional boreholes were planned for 2017 but could not be completed due to adverse ground conditions at the time of the investigation. Shale fill comprises the bulk of the O-29X pad and the drilling rig was unable to provide sufficient returns for sample logging/collection.

4.8.2 Groundwater and Surface Water Monitoring

Across Goose Island, three monitoring wells and one surface water sample location were planned for inclusion in the 2017 groundwater and surface water program. One monitoring well and the surface water location could not be accessed safely during the 2017 field program and were not sampled. The monitoring results for the remaining two wells are summarized below.

- groundwater flow is generally inferred to follow local topography, with localized shallow flow towards unnamed lakes or the Mackenzie River; and
- exceedances were observed at two monitoring wells for one or more parameters including dissolved iron (one well), phenols (two wells), and cadmium (one well).

Monitoring well locations are shown in Figure 8C.

4.8.3 Goose Island Background/Control Points (GIBG)

One monitoring well is included in the analytical schedule in order to assess background hydrochemistry in the Goose Island area. The location was sampled in 2017 to supplement the background geochemistry database. Dissolved metals concentrations including iron and cadmium exceeded the FWAL guidelines. The well location is shown on Figure 8C (GIBG 10-2-3).

5. Quality Assurance / Quality Control (QA/QC)

The following is a description of the QA/QC program as included in the 2017 groundwater and soil monitoring programs. The intention of the C&R report is to summarize various environmental programs, without providing all related details, data tables and equations referenced in this description, which are reported under separate cover. Based on the review of QA/QC information, the overall data quality is considered acceptable for the purposes of the 2017 monitoring programs.

5.1 Groundwater Sampling QAQC

5.1.1 Laboratory QAQC

Upon arrival of the Sample Receipt Confirmation from Maxxam, Advisian staff review the confirmation form to verify that all the shipped samples had been received and that the requested parameters had been logged for analysis. For quality assurance purposes, Maxxam regularly uses calibration checks, surrogate matrix spikes, blanks, and laboratory duplicates during analyses. Laboratory QA/QC results indicate that quality assurance guidelines were met as outlined in the laboratory reports. Any deviations or exceptions to this have been summarized, along with potential impacts that such deviations may have had upon the reported data and its interpretation. The laboratory dataset is entered into the WorleyParsons internal database for data management purposes following receipt and review of any Certificates of Analysis.

5.1.2 Field QAQC - Field Duplicate Samples

In 2017, a total of 25 coded field duplicate samples for dissolved hydrocarbons, phenols, dissolved metals and trace elements, total metals and trace elements, and/or polycyclic aromatic hydrocarbons were submitted to the laboratory, representing approximately 14% of the actively monitored wells (183 total). The purpose of field duplicates is to determine repeatability and accuracy of analytical results.

For low-level concentrations (<0.1 mg/L), duplicate data within an order of magnitude is considered adequate. Higher analytical concentrations are typically assessed in terms of relative percent difference (RPD). The RPD between an original field sample and its blind field duplicate is calculated. Analytical data within an RPD of 50% (inorganic parameters) or 80% (organic parameters) are generally considered to be of good quality.

5.1.3 Field QA/QC - Trip Blank Samples

Coded trip blank samples consisting of mega-pure distilled water (i.e. hydrocarbon-free) were requested from Maxxam and analyzed for BTEX, PHC F1 and F2. The purpose of a trip blank is to identify whether the inadvertent introduction of hydrocarbons has occurred during sample handling, transport, or in the laboratory. A total of 28 coded trip blanks were submitted to the laboratory in 2017.

Trip blank analytical results for dissolved hydrocarbons including BTEX and PHC F1 and F2 were below method detection limits.

5.1.4 Field QA/QC - Field Blank Samples

Field blank samples are created by filling clean sample bottles with pure distilled water (i.e. hydrocarbon-free) in the same locations and following the same field sampling procedures as used during collection of groundwater and surface water samples. A total of 12 coded field blanks were submitted to the laboratory for BTEX, PHC F1 and F2 in 2017. Field blank analytical results for dissolved hydrocarbons including BTEX and PHC F1 and F2 were below method detection limits.

5.2 Soil Sampling QAQC

5.2.1 Field QAQC - Field Duplicate Samples

Nine coded field duplicate samples were submitted to the laboratory for analysis of inorganic and salinity parameters, petroleum hydrocarbon parameters, metals and trace elements and/or polycyclic aromatic hydrocarbons. The purpose of a field duplicate is to determine repeatability and accuracy of analytical results. Soils analytical data within an RPD of 100% are generally considered to be of good quality.

6. 2018 Closure and Reclamation Program

Imperial is in the preliminary stages of planning the 2018 C&R program for Norman Wells, based on the information gathered from the 2017 and previous programs. It is anticipated that the following activities will be part of the 2018 program:

- the groundwater and surface water monitoring program conducted in 2017 will be further optimized and executed in 2018;
- due to the temporary shutdown of oilfield production during early 2017, pending repairs to the Enbridge Line 21 pipeline, operations of the Refinery Bank and B38X remediation systems have been temporarily suspended. Consequently, groundwater monitoring and sampling events are being completed at an increased frequency in the Refinery Bank area to monitor hydrocarbon plume behaviour during the dormant period;
- operation of the two soil treatment cells (Biocells 1 and 2) will continue until treated soil meets applied CCME Industrial land use guidelines. Treated soils will be re-used on the Site as industrial fill. As space becomes available in the cells, hydrocarbon impacted soils will be imported from various locations within the Norman Wells site, prioritized appropriately to optimize treatability and mitigate environmental risk;
- vegetation cover and physical stability monitoring will continue at the Well Services and Mainland Sumps areas, the Reduced Crude Flare Pit, the Tank 401 and Tank 53 areas, the Cemetery Sump area and the East Bank of Bosworth Creek;
- Bosworth Creek restoration and monitoring activities will include monitoring the slope stabilization and revegetation progress, filling the transverse cracks and conducting maintenance of slope stabilization infrastructure, including augmenting stakes on the coir logs, and re-installing the silt fence;
- ongoing assessment for backfill soil settlement will be completed at the Mainland Sumps;
- the backfilled and capped C-27X Sump will be assessed for settlement, and re-contoured as necessary;
- wellhead cut and cap activities will be conducted at abandoned wells deemed by IOR to be no longer required for Site operations;
- Phase II investigations will be conducted at any well sites selected by IOR for abandonment, locations of reported spills from operational facilities, and at historic areas of impact where data gaps have been identified;
- key applied technology and guideline development (vegetation and invertebrate eco-toxicity) projects will continue; and
- shallow permafrost conditions will be monitored through a network of thermistors installed in key areas in 2013 and 2016. The thermistors will assist in determining the potential for lateral groundwater migration above permafrost on a year-round basis in the vicinity of key areas of concern.

Appendix 12 provides a list of historical and on-going C&R program activities.

7. Closure

We trust that this report satisfies your current requirements and provides suitable documentation for your records. If you have any questions or require further details, please contact the undersigned at any time.

Report Prepared by:

Lorian Glatiotis, B.Sc., P.Geo. (AB)
Hydrogeologist

Senior Review by:

PROFESSIONAL GEOLOGIST ALBERTA
MICHAEL J. BROWN
5/30/2018

PERMIT TO PRACTICE
WORLEYPARSONS CANADA SERVICES LTD.
Signature
Date May 30, 2018
PERMIT NUMBER: P 029
NWT/NU Association of Professional Engineers and Geoscientists

Michael Brown, M.Sc., P.Geo.
Principal Hydrogeologist

Advisian, Americas

Tables



Advisian
WorleyParsons Group

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
Central Processing Facility (CPF)																			
CPF 09-3-5	**Active**	598973.239	7242185.601	62.59	63.39	4.50	1.30 - 4.50	1.30 - 4.50	17-Aug-2017	1.89	1.09	N/M	N/A	N/A	1.89	1.09	61.50	5.5e-007	Silt/clay/siltstone bedrock
CPF 09-6-19	**Active**	598973.721	7242191.602	62.61	63.41	18.80	15.80 - 18.80	15.50 - 18.95	17-Aug-2017	9.93	9.13	N/M	N/A	N/A	9.93	9.13	53.48	N/M	Silty sandstone
CPF 97-2-7	**Active**	598809.870	7242314.371	62.72	63.35	6.70	0.80 - 3.80	4.70 - 6.70	17-Aug-2017	2.22	1.59	N/M	N/A	N/A	2.22	1.59	61.13	N/M	Siltstone
CPF 97-7-5	**Active**	599100.347	7241852.827	58.64	59.49	4.90	N/A	1.20 - 4.90	17-Aug-2017	1.25	0.41	N/M	N/A	N/A	1.25	0.41	58.24	1.1e-008	Silt/siltstone
									12-Sep-2017	1.39	0.55	N/M	N/A	N/A	1.39	0.55	58.10		
CPF 98-3-5	**Active**	N/M	N/M	62.94	63.74	5.20	2.20 - 5.20	1.80 - 5.20	17-Aug-2017	2.46	1.66	N/M	N/A	N/A	2.46	1.66	61.28	8.6e-007	Clay/silt/siltstone
CPF 98-6-3	**Active**	598951.622	7241860.042	61.12	61.76	2.90	N/A	0.80 - 3.00	17-Aug-2017	2.13	1.49	N/M	N/A	N/A	2.13	1.49	59.63	1e-007	Fill/peat/silt
CPF 98-8-3	**Active**	598705.553	7241839.552	58.79	59.54	2.70	1.40 - 2.90	0.80 - 2.90	17-Aug-2017	1.66	0.91	N/M	N/A	N/A	1.66	0.91	57.88	1.7e-006	Clay silt
									12-Sep-2017	1.31	0.56	N/M	N/A	N/A	1.31	0.56	58.23		
E-27X Well Site																			
E27 09-2-16	**Active**	598724.257	7241687.822	58.16	59.01	16.30	15.30 - 16.30	12.75 - 16.70	20-Aug-2017	11.39	10.54	N/M	N/A	N/A	11.39	10.54	47.62	>1.0E-05	Silty sandstone
Background/Control Point Locations - Mainland West																			
MWBG-10-1-3	**Active**	598506.761	7242002.859	57.16	57.94	2.50	1.00 - 2.50	0.80 - 2.70	17-Aug-2017	1.44	0.66	N/M	N/A	N/A	1.44	0.66	56.50	2.60E-07	Clay
WBIO 08-1-2	**Active**	597742.780	7241919.114	59.57	60.40	2.40	N/A	0.60 - 2.40	18-Aug-2017	> 3.48	> 2.65	N/M	N/A	N/A	> 3.48	> 2.65	< 56.92	1.41e-006	Sandy clay/silty sand/silty clay till
Former Battery #3 and Battery #3 Flare Pit																			
BT3 02-32-6	**Active**	599747.164	7241624.252	56.39	57.09	5.90	2.90 - 5.90	2.70 - 6.00	13-Aug-2017	5.69	4.99	N/M	N/A	N/A	5.69	4.99	51.40	4.4e-007	Silt
BT3 02-34-4	**Active**	599856.103	7241542.276	58.95	59.65	4.45	1.45 - 4.30	1.00 - 6.10	13-Aug-2017	2.97	2.27	N/M	N/A	N/A	2.97	2.27	56.68	8.7e-007	Sand and shale
BT3 97-11-11	**Active**	599721.600	7241502.300	57.13	58.19	11.21	N/A	8.31 - 10.91	13-Aug-2017	10.08	9.02	N/M	N/A	N/A	10.08	9.02	48.11	9.3e-010	Siltstone
BT3 99-20-13	**Active**	599714.629	7241605.876	55.82	56.42	12.50	9.40 - 12.40	9.30 - 13.10	13-Aug-2017	10.45	9.85	N/M	N/A	N/A	10.45	9.85	45.97	>1.0E-05	Siltstone
BT3 99-21-12	**Active**	599712.571	7241641.774	56.61	57.18	11.95	8.90 - 11.95	8.50 - 12.20	13-Aug-2017	10.95	10.38	N/M	N/A	N/A	10.95	10.38	46.23	2.30E-06	Siltstone
BT3 99-23-13	**Active**	599683.523	7241696.591	57.07	57.63	13.40	7.50 - 13.40	6.40 - 13.40	13-Aug-2017	10.77	10.21	N/M	N/A	N/A	10.77	10.21	46.86	1.30E-06	Shale
Biocells, ARB and B-33X Area																			
ARB-10-2-3	**Active**	599730.914	7241983.610	N/M	N/M	3.00	1.50 - 3.00	1.20 - 2.40	12-Aug-2017	1.84	N/A	N/M	N/A	N/A	1.84	N/A	N/A	8.42e-007	Silty Clay and Sand
ARB-12-4-2	**Active**	599781.082	7241921.930	64.92	65.62	2.45	0.75 - 2.25	0.40 - 2.45	11-Aug-2017	2.05	1.35	N/M	N/A	N/A	2.05	1.35	63.57	2.4e-006	Gravel fill/Sand/Peat
ARB-12-3-3	**Active**	599801.144	7242007.048	65.33	66.02	2.70	1.20 - 2.70	0.80 - 2.70	12-Aug-2017	2.62	1.93	N/M	N/A	N/A	2.62	1.93	63.40	N/M	Gravel fill/Sand/Peat
									12-Sep-2017	2.45	1.76	N/M	N/A	N/A	2.45	1.76	63.57		
ARB-12-1-4	**Active**	599719.248	7241937.631	64.66	65.40	3.40	1.90 - 3.40	1.50 - 3.40	11-Aug-2017	2.48	1.74	N/M	N/A	N/A	2.48	1.74	62.92	1e-006	Sandy Gravel/Sand/Top Soil
ARB-13-1-4.5	**Active**	599684.676	7241949.919	63.13	64.15	N/A	2.70 - 4.20	2.33 - 4.50	12-Aug-2017	1.86	0.83	N/M	N/A	N/A	1.86	0.83	62.29	8.10e-08	
ARB-13-3-4.5	**Active**	599590.175	7241935.302	62.82	63.85	N/A	2.70 - 4.20	2.40 - 4.50	12-Aug-2017	1.83	0.80	N/M	N/A	N/A	1.83	0.80	62.02	N/M	
ARB-13-5-4.5	**Active**	599643.671	7241876.137	63.12	64.07	N/A	2.85 - 4.35	2.55 - 4.50	12-Aug-2017	4.98	4.03	N/M	N/A	N/A	4.98	4.03	59.09	N/M	
ARB-16-1-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	11-Aug-2017	2.75	N/A	N/M	N/A	N/A	2.75	N/A	N/A	N/M	
ARB-17-1-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	1.35	N/A	N/M	N/A	N/A	1.35	N/A	N/A	N/M	

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
ARB-17-2-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	1.15	N/A	N/M	N/A	N/A	1.15	N/A	N/A	N/M	
ARB-17-3-5	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	1.53	N/A	N/M	N/A	N/A	1.53	N/A	N/A	N/M	
BC2-15-1-3	**Active**	599893.080	7242021.090	64.91	65.74	N/A	N/A	N/A	12-Aug-2017	2.25	1.42	N/M	N/A	N/A	2.25	1.42	63.49	N/M	
BC2-15-2-4	**Active**	599908.110	7241971.250	64.91	65.61	N/A	N/A	N/A	12-Aug-2017	1.88	1.18	N/M	N/A	N/A	1.88	1.18	63.73	1.30E-07	
BC2-15-3-4	**Active**	599893.890	7241906.730	64.56	65.32	N/A	N/A	N/A	11-Aug-2017	1.55	0.79	N/M	N/A	N/A	1.55	0.79	63.77	N/M	
BC2-15-4-3	**Active**	599844.080	7241872.110	64.73	65.56	N/A	N/A	N/A	11-Aug-2017	1.87	1.04	N/M	N/A	N/A	1.87	1.04	63.69	N/M	
F-31X Well Site																			
F31 97-3-5	**Active**	N/M	N/M	52.92	53.77	4.60	1.50 - 4.60	1.10 - 4.60	17-Aug-2017	> 5.70	> 4.86	N/M	N/A	N/A	> 5.70	> 4.86	< 48.07	3.559e-007	Silt
F31 98-1-4	**Active**	N/M	N/M	52.87	53.69	4.00	1.00 - 4.00	0.80 - 4.00	17-Aug-2017	4.76	3.94	N/M	N/A	N/A	4.76	3.94	48.93	1.9e-006	Silt
G-32X Well Site																			
G32-10-1-3	**Active**	599316.728	7241454.864	49.66	50.42	2.88	1.31 - 2.88	1.21 - 2.88	17-Aug-2017	2.86	2.10	N/M	N/A	N/A	2.86	2.10	47.56	N/M	Clayey Silt
B-30X Well Site																			
B30-13-1-5.4	**Active**	599472.007	7241920.271	61.91	62.92	N/A	2.10 - 5.10	1.80 - 5.40	13-Aug-2017	2.77	1.76	N/M	N/A	N/A	2.77	1.76	60.15	2.90E-08	
B30-13-2-4.5	**Active**	599613.230	7242077.063	63.31	64.23	N/A	2.40 - 3.90	2.10 - 4.50	13-Aug-2017	2.89	1.96	N/M	N/A	N/A	2.89	1.96	61.34	N/M	
B30-13-3-4.5	**Active**	599464.259	7242109.385	63.52	64.42	N/A	2.70 - 4.20	2.40 - 4.50	13-Aug-2017	2.95	2.05	N/M	N/A	N/A	2.95	2.05	61.47	N/M	
B30-13-4-3.9	**Active**	599282.599	7242116.513	62.97	63.90	N/A	2.25 - 3.75	1.95 - 3.90	18-Aug-2017	1.59	0.66	N/M	N/A	N/A	1.59	0.66	62.31	N/M	
B30-17-1-5	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	2.99	N/A	N/M	N/A	N/A	2.99	N/A	N/A	N/M	
B30X-12-2-4	**Active**	599472.180	7242075.933	62.95	63.74	3.80	0.70 - 3.70	0.50 - 3.80	13-Aug-2017	2.73	1.94	N/M	N/A	N/A	2.73	1.94	61.01	N/M	Sand/Clay
B30X-12-1-4	**Active**	599460.422	7242066.046	63.62	64.41	4.50	1.00 - 4.00	0.70 - 4.00	13-Aug-2017	2.89	2.10	N/M	N/A	N/A	2.89	2.10	61.52	N/M	Silty Sand/Clay
Well Services/Warehouse Yard																			
WSY 97-1-5	**Active**	599274.168	7242034.279	62.61	63.40	4.70	1.70 - 4.70	1.10 - 4.70	18-Aug-2017	2.69	1.90	N/M	N/A	N/A	2.69	1.90	60.71	1.7e-007	Silt
									12-Sep-2017	2.86	2.07	N/M	N/A	N/A	2.86	2.07	60.54	N/M	
WSY 97-2-4	**Active**	599504.921	7242039.182	62.23	63.20	4.50	1.60 - 4.40	1.10 - 4.40	13-Aug-2017	2.06	1.09	N/M	N/A	N/A	2.06	1.09	61.14	2.3e-007	Silt
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area																			
BOS-DP-13-1-1.4	**Active**	599584.495	7241734.263	46.27	47.47	2.00	0.50 - 2.00	0.50 - 2.00	18-Aug-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	1.40E-05	
BOS-DP-13-2-1.35	**Active**	N/M	N/M	N/M	N/M	N/A	1.00 - 1.60	1.00 - 1.60	18-Aug-2017	1.24	N/A	N/M	N/A	N/A	1.24	N/A	N/A	N/M	
BOS-DP-13-3-2	**Active**	N/M	N/M	N/M	N/M	N/A	0.50 - 2.00	0.50 - 2.00	18-Aug-2017	1.66	N/A	N/M	N/A	N/A	1.66	N/A	N/A	N/M	
BOS-DP-13-4-3	**Active**	N/M	N/M	N/M	N/M	N/A	0.50 - 2.00	0.50 - 2.00	18-Aug-2017	1.67	N/A	N/M	N/A	N/A	1.67	N/A	N/A	N/M	
C30-10-1-5	**Active**	N/M	N/M	61.10	61.88	4.50	1.50 - 4.50	1.20 - 4.50	12-Aug-2017	4.05	3.26	N/M	N/A	N/A	4.05	3.26	57.83	3.629e-007	Clayey Silt
Background/Control Point Locations - Mainland Central																			
MCBG-10-1-3	**Active**	599865.600	7242083.517	63.73	64.46	2.50	1.00 - 2.50	0.80 - 2.50	12-Aug-2017	1.56	0.83	N/M	N/A	N/A	1.56	0.83	62.90	9.86e-008	Clayey Silt / Peat and Organics / Silty Clay
MCBG-12-1-2	**Active**	599408.677	7242266.555	63.24	64.03	3.00	0.70 - 2.20	0.50 - 3.00	20-Aug-2017	1.45	0.66	N/M	N/A	N/A	1.45	0.66	62.58	N/M	Sand/Silty Clay
MCBG-16-5-4	**Active**	599515.920	7241489.390	53.59	54.65	N/A	N/A	N/A	18-Aug-2017	N/M	N/A	N/M	N/A	N/A	N/M	N/A	N/A	N/M	

Advisian
WorleyParsons Group

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
Former Refinery Area																			
NWR 01-29-7	**Active**	600447.160	7241260.610	48.90	49.62	7.30	4.40 - 7.40	4.10 - 7.40	14-Mar-2017	8.874	8.131	8.845	0.029	0.023	8.851	8.131	40.765	N/M	Silt/sand/mud/shale
									11-Apr-2017	9.070	8.230	8.920	0.150	0.120	8.950	8.230	40.666		
									15-Jun-2017	6.800	5.960	6.650	0.150	0.120	6.680	5.960	42.936		
									15-Jul-2017	7.130	6.386	7.100	0.030	0.024	7.106	6.386	42.510		
									19-Aug-2017	7.480	6.752	7.470	0.010	0.008	7.472	6.752	42.144		
									15-Sep-2017	7.245	6.493	7.205	0.040	0.032	7.213	6.493	42.403		
									14-Oct-2017	7.223	6.494	7.212	0.011	0.009	7.214	6.494	42.402		
									21-Nov-2017	7.566	6.844	7.563	0.003	0.002	7.564	6.844	42.052		
									19-Dec-2017	7.855	7.123	7.840	0.015	0.012	7.843	7.123	41.773		
NWR 02-12-7	**Active**	600535.584	7241293.190	56.11	56.81	7.00	4.00 - 7.00	3.80 - 7.60	13-Aug-2017	7.41	6.71	N/M	N/A	N/A	7.41	6.71	49.40	6.7e-007	Sand/gravel
NWR 02-15-9	**Active**	600372.680	7241425.370	58.07	58.77	9.00	6.00 - 9.00	5.40 - 9.00	13-Aug-2017	> 8.89	> 8.19	N/M	N/A	N/A	> 8.89	> 8.19	< 49.88	N/M	
NWR 03-42-19	**Active**	600460.223	7241274.029	52.82	53.47	19.70	10.60 - 19.70	8.70 - 19.70	14-Mar-2017	12.190	11.394	12.007	0.183	0.146	12.044	11.394	41.426	>1.0E-05	Silty clay
									11-Apr-2017	12.380	11.570	12.180	0.200	0.160	12.220	11.570	41.250		
									15-Jun-2017	10.180	9.466	10.100	0.080	0.064	10.116	9.466	43.354		
									15-Jul-2017	10.550	9.828	10.460	0.090	0.072	10.478	9.828	42.992		
									13-Aug-2017	10.867	10.144	10.776	0.091	0.073	10.794	10.144	42.676		
									15-Sep-2017	10.635	9.921	10.555	0.080	0.064	10.571	9.921	42.899		
									14-Oct-2017	10.602	9.880	10.512	0.090	0.072	10.530	9.880	42.940		
									21-Nov-2017	10.816	10.149	10.795	0.021	0.017	10.799	10.149	42.671		
NWR 03-43-20	**Active**	600438.440	7241281.053	53.09	53.74	19.80	10.60 - 19.80	9.20 - 19.80	13-Aug-2017	10.959	10.300	10.948	0.011	0.009	10.950	10.300	42.790	>1.0E-05	
NWR 09-1-20	**Active**	600524.659	7241263.256	54.70	55.28	20.00	17.50 - 20.00	16.50 - 20.00	13-Aug-2017	11.98	11.40	N/M	N/A	N/A	11.98	11.40	43.30	N/M	Shale/sandy siltstone/sandstone
NWR 09-2-26	**Active**	600481.793	7241286.321	55.47	56.31	26.30	23.20 - 26.20	23.00 - 26.30	13-Aug-2017	10.83	9.99	N/M	N/A	N/A	10.83	9.99	45.48	7.02e-008	Clay/silty sandstone
NWR 09-3-20	**Active**	600466.358	7241316.999	56.78	57.60	19.90	16.90 - 19.90	15.10 - 20.20	13-Aug-2017	14.13	13.31	N/M	N/A	N/A	14.13	13.31	43.47	6.7e-009	Sandstone
NWR 09-4-17	**Active**	600534.023	7241288.643	55.83	56.60	17.00	15.50 - 17.00	15.24 - 17.30	13-Aug-2017	13.06	12.29	N/M	N/A	N/A	13.06	12.29	43.54	4.9e-010	Siltstone
NWR 09-4-5	**Active**	600430.188	7241255.748	45.89	46.16	4.50	1.50 - 4.50	1.10 - 4.50	14-Mar-2017	4.59	4.32	N/M	N/A	N/A	4.59	4.32	41.57	>1.0E-05	Siltstone bedrock
									11-Apr-2017	4.62	4.35	N/M	N/A	N/A	4.62	4.35	41.54		
									16-Jun-2017	2.22	1.95	N/M	N/A	N/A	2.22	1.95	43.94		
									15-Jul-2017	2.70	2.43	N/M	N/A	N/A	2.70	2.43	43.46		
									15-Aug-2017	3.05	2.78	N/M	N/A	N/A	3.05	2.78	43.11		
									19-Aug-2017	3.06	2.79	N/M	N/A	N/A	3.06	2.79	43.10		
									14-Sep-2017	2.87	2.60	N/M	N/A	N/A	2.87	2.60	43.29		
									14-Oct-2017	2.82	2.55	N/M	N/A	N/A	2.82	2.55	43.34		
									21-Nov-2017	3.20	2.93	N/M	N/A	N/A	3.20	2.93	42.96		
									19-Dec-2017	3.46	3.19	N/M	N/A	N/A	3.46	3.19	42.70		
NWR 09-5-19	**Active**	600573.424	7241254.632	55.88	56.65	20.30	17.30 - 20.30	17.00 - 20.50	13-Aug-2017	13.51	12.74	N/M	N/A	N/A	13.51	12.74	43.14	4.1e-008	Sandstone/claystone
NWR 98-13-21	**Active**	600429.505	7241331.446	56.81	57.30	21.30	18.30 - 21.30	16.50 - 22.90	13-Aug-2017	14.62	14.13	N/M	N/A	N/A	14.62	14.13	42.68	3.9e-006	Siltstone
NWR 98-23-21	**Active**	600492.173	7241254.988	50.91	51.26	21.40	18.40 - 21.40	13.80 - 21.40	13-Aug-2017	8.105	7.725	8.067	0.038	0.030	8.075	7.725	43.183	1.3e-007	Siltstone
RB-OBS-42	**Active**	600441.510	7241241.752	46.84	47.03	3.00	1.50 - 3.00	1.10 - 3.00	14-Mar-2017	> 3.19	> 3.00	N/M	N/A	N/A	> 3.19	> 3.00	< 43.84	N/M	Sandy Silt
									11-Apr-2017	> 3.19	> 3.00	N/M	N/A	N/A	> 3.19	> 3.00	< 43.84		

Advisian
WorleyParsons Group

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
RB-OBS-46	**Active**	600481.874	7241233.855	47.81	47.93	4.30	2.80 - 4.30	2.40 - 4.30	14-Mar-2017	4.25	4.13	N/M	N/A	N/A	4.25	4.13	43.68	N/M	Sandy Clay/Silty Sand
									11-Apr-2017	4.29	4.17	N/M	N/A	N/A	4.29	4.17	43.64		
									15-Jun-2017	2.46	2.34	N/M	N/A	N/A	2.46	2.34	45.47		
									15-Jul-2017	3.30	3.18	N/M	N/A	N/A	3.30	3.18	44.63		
									19-Aug-2017	3.77	3.65	N/M	N/A	N/A	3.77	3.65	44.16		
									15-Sep-2017	3.64	3.52	N/M	N/A	N/A	3.64	3.52	44.29		
									14-Oct-2017	3.71	3.59	N/M	N/A	N/A	3.71	3.59	44.22		
									21-Nov-2017	3.98	3.86	N/M	N/A	N/A	3.98	3.86	43.95		
									19-Dec-2017	4.06	3.94	N/M	N/A	N/A	4.06	3.94	43.87		
RB-OBS-47	**Active**	600472.249	7241230.800	47.27	47.41	6.00	1.00 - 4.00	0.70 - 4.00	14-Mar-2017	3.92	3.78	N/M	N/A	N/A	3.92	3.78	43.49	N/M	Silty Clay with Sand/Clay/Sand
									11-Apr-2017	4.00	3.86	N/M	N/A	N/A	4.00	3.86	43.41		
									15-Jun-2017	1.09	0.95	N/M	N/A	N/A	1.09	0.95	46.32		
									15-Jul-2017	2.70	2.56	N/M	N/A	N/A	2.70	2.56	44.71		
									19-Aug-2017	3.26	3.12	N/M	N/A	N/A	3.26	3.12	44.15		
									15-Sep-2017	2.76	2.62	N/M	N/A	N/A	2.76	2.62	44.65		
									14-Oct-2017	3.28	3.14	N/M	N/A	N/A	3.28	3.14	44.13		
									21-Nov-2017	3.57	3.43	N/M	N/A	N/A	3.57	3.43	43.84		
									19-Dec-2017	3.69	3.55	N/M	N/A	N/A	3.69	3.55	43.72		
RB-13-1-2.4	**Active**	600502.375	7241194.566	43.39	43.26	N/A	0.90 - 2.40	N/A	14-Sep-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	N/M	
RB-13-2-2.4	**Active**	600418.140	7241196.570	42.64	42.36	N/A	0.90 - 2.40	N/A	14-Sep-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	N/M	
RB-13-4-3	**Active**	600337.480	7241257.990	42.43	42.28	N/A	1.50 - 3.00	N/A	14-Sep-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	N/M	
RB-MW17-01	**Active**	600512.866	7241204.771	44.46	44.46	N/A	1.20 - 2.70	1.00 - 3.00	16-Jun-2017	0.76	0.76	N/M	N/A	N/A	0.76	0.76	43.70	N/M	
									15-Jul-2017	1.10	1.10	N/M	N/A	N/A	1.10	1.10	43.36		
									19-Aug-2017	1.43	1.43	N/M	N/A	N/A	1.43	1.43	43.03		
									14-Sep-2017	1.35	1.35	N/M	N/A	N/A	1.35	1.35	43.11		
									14-Oct-2017	1.28	1.28	N/M	N/A	N/A	1.28	1.28	43.18		
									21-Nov-2017	1.80	1.80	N/M	N/A	N/A	1.80	1.80	42.66		
									19-Dec-2017	2.08	2.08	N/M	N/A	N/A	2.08	2.08	42.38		
RB-MW17-02	**Active**	600503.853	7241205.386	44.27	44.27	N/A	2.25 - 3.75	2.00 - 3.75	16-Jun-2017	0.59	0.59	N/M	N/A	N/A	0.59	0.59	43.68	N/M	
									15-Jul-2017	0.89	0.89	N/M	N/A	N/A	0.89	0.89	43.38		
									19-Aug-2017	1.25	1.25	N/M	N/A	N/A	1.25	1.25	43.02		
									14-Sep-2017	1.14	1.14	N/M	N/A	N/A	1.14	1.14	43.13		
									14-Oct-2017	1.18	1.18	N/M	N/A	N/A	1.18	1.18	43.09		
									21-Nov-2017	1.55	1.55	N/M	N/A	N/A	1.55	1.55	42.72		
									19-Dec-2017	1.83	1.83	N/M	N/A	N/A	1.83	1.83	42.44		
RB-MW17-03	**Active**	600493.699	7241206.460	44.43	44.43	N/A	3.00 - 4.50	2.75 - 4.50	16-Jun-2017	0.64	0.64	N/M	N/A	N/A	0.64	0.64	43.79	N/M	
									16-Jul-2017	1.13	1.13	N/M	N/A	N/A	1.13	1.13	43.30		
									19-Aug-2017	1.41	1.41	N/M	N/A	N/A	1.41	1.41	43.02		
									14-Sep-2017	1.27	1.27	N/M	N/A	N/A	1.27	1.27	43.16		
									14-Oct-2017	1.23	1.23	N/M	N/A	N/A	1.23	1.23	43.20		
									21-Nov-2017	1.68	1.68	N/M	N/A	N/A	1.68	1.68	42.75		
									19-Dec-2017	1.96	1.96	N/M	N/A	N/A	1.96	1.96	42.47		

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
RB-MW17-04	**Active**	600484.130	7241207.960	44.78	44.78	N/A	3.00 - 4.50	2.75 - 4.50	15-Jun-2017	0.97	0.97	N/M	N/A	N/A	0.97	0.97	43.81	N/M	
									15-Jul-2017	1.41	1.41	N/M	N/A	N/A	1.41	1.41	43.37		
									19-Aug-2017	0.80	0.80	N/M	N/A	N/A	0.80	0.80	43.98		
									14-Sep-2017	1.60	1.60	N/M	N/A	N/A	1.60	1.60	43.18		
									14-Oct-2017	1.55	1.55	N/M	N/A	N/A	1.55	1.55	43.23		
									21-Nov-2017	2.01	2.01	N/M	N/A	N/A	2.01	2.01	42.77		
									19-Dec-2017	2.30	2.30	N/M	N/A	N/A	2.30	2.30	42.48		
RB-MW17-05	**Active**	600476.409	7241207.174	44.76	44.76	N/A	3.00 - 4.50	2.75 - 5.50	15-Jun-2017	4.29	4.29	N/M	N/A	N/A	4.29	4.29	40.47	N/M	
									15-Jul-2017	1.07	1.07	N/M	N/A	N/A	1.07	1.07	43.69		
									19-Aug-2017	0.99	0.99	N/M	N/A	N/A	0.99	0.99	43.77		
									14-Sep-2017	1.31	1.31	N/M	N/A	N/A	1.31	1.31	43.45		
									14-Oct-2017	1.530	1.520	1.517	0.013	0.010	1.520	1.520	43.241		
									21-Nov-2017	2.390	2.374	2.370	0.020	0.016	2.374	2.374	42.387		
									19-Dec-2017	2.882	2.368	2.240	0.642	0.514	2.368	2.368	42.393		
RB-MW17-06	**Active**	600467.027	7241210.404	45.06	45.06	N/A	2.50 - 4.00	2.25 - 4.50	16-Jun-2017	2.21	2.21	N/M	N/A	N/A	2.21	2.21	42.85	N/M	
									15-Jul-2017	1.43	1.43	N/M	N/A	N/A	1.43	1.43	43.63		
									19-Aug-2017	1.45	1.45	N/M	N/A	N/A	1.45	1.45	43.61		
									14-Sep-2017	1.40	1.40	N/M	N/A	N/A	1.40	1.40	43.66		
									14-Oct-2017	1.70	1.70	N/M	N/A	N/A	1.70	1.70	43.36		
									21-Nov-2017	1.93	1.93	N/M	N/A	N/A	1.93	1.93	43.13		
									19-Dec-2017	2.49	2.49	N/M	N/A	N/A	2.49	2.49	42.57		
RB-MW17-07	**Active**	600456.477	7241213.800	45.18	45.18	N/A	4.00 - 5.50	3.75 - 5.50	16-Jun-2017	1.25	1.25	N/M	N/A	N/A	1.25	1.25	43.93	N/M	
									15-Jul-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A		
									19-Aug-2017	0.77	0.77	N/M	N/A	N/A	0.77	0.77	44.41		
									14-Sep-2017	1.89	1.89	N/M	N/A	N/A	1.89	1.89	43.29		
									14-Oct-2017	1.99	1.99	N/M	N/A	N/A	1.99	1.99	43.19		
									21-Nov-2017	2.24	2.24	N/M	N/A	N/A	2.24	2.24	42.94		
									19-Dec-2017	2.50	2.50	N/M	N/A	N/A	2.50	2.50	42.68		
RB-MW17-08	**Active**	600445.392	7241218.210	45.40	45.40	N/A	4.30 - 5.80	4.00 - 5.80	16-Jun-2017	1.45	1.45	N/M	N/A	N/A	1.45	1.45	43.95	N/M	
									15-Jul-2017	1.89	1.89	N/M	N/A	N/A	1.89	1.89	43.51		
									19-Aug-2017	2.27	2.27	N/M	N/A	N/A	2.27	2.27	43.13		
									14-Sep-2017	2.09	2.09	N/M	N/A	N/A	2.09	2.09	43.31		
									14-Oct-2017	2.05	2.05	N/M	N/A	N/A	2.05	2.05	43.35		
									21-Nov-2017	2.43	2.43	N/M	N/A	N/A	2.43	2.43	42.97		
									19-Dec-2017	2.72	2.72	N/M	N/A	N/A	2.72	2.72	42.68		
RB-MW17-09	**Active**	600437.667	7241227.749	45.93	45.93	N/A	4.30 - 5.80	4.10 - 6.00	16-Jun-2017	1.98	1.98	N/M	N/A	N/A	1.98	1.98	43.95	N/M	
									15-Jul-2017	2.42	2.42	N/M	N/A	N/A	2.42	2.42	43.51		
									19-Aug-2017	2.80	2.80	N/M	N/A	N/A	2.80	2.80	43.13		
									14-Sep-2017	2.62	2.62	N/M	N/A	N/A	2.62	2.62	43.31		
									14-Oct-2017	2.57	2.57	N/M	N/A	N/A	2.57	2.57	43.36		
									21-Nov-2017	2.95	2.95	N/M	N/A	N/A	2.95	2.95	42.98		
									19-Dec-2017	3.22	3.22	N/M	N/A	N/A	3.22	3.22	42.71		

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
RB-MW17-10	**Active**	600424.957	7241232.973	44.41	44.41	N/A	2.50 - 4.00	2.25 - 4.50	15-Jun-2017	0.490	0.466	0.460	0.030	0.024	0.466	0.466	43.946	N/M	
									15-Jul-2017	0.960	0.888	0.870	0.090	0.072	0.888	0.888	43.524		
									19-Aug-2017	1.292	1.286	1.285	0.007	0.006	1.286	1.286	43.126		
									15-Sep-2017	1.08	1.08	N/M	N/A	N/A	1.08	1.08	43.33		
									14-Oct-2017	1.080	1.056	1.050	0.030	0.024	1.056	1.056	43.356		
									21-Nov-2017	1.43	1.43	N/M	N/A	N/A	1.43	1.43	42.98		
									19-Dec-2017	1.705	1.677	1.670	0.035	0.028	1.677	1.677	42.735		
RB-MW17-11	**Active**	600413.608	7241239.480	44.41	44.41	N/A	2.50 - 4.00	2.25 - 4.30	15-Jun-2017	0.490	0.458	0.450	0.040	0.032	0.458	0.458	43.951	N/M	
									15-Jul-2017	0.940	0.908	0.900	0.040	0.032	0.908	0.908	43.501		
									19-Aug-2017	1.305	1.281	1.275	0.030	0.024	1.281	1.281	43.128		
									15-Sep-2017	1.080	1.072	1.070	0.010	0.008	1.072	1.072	43.337		
									14-Oct-2017	1.090	1.066	1.060	0.030	0.024	1.066	1.066	43.343		
									21-Nov-2017	1.426	1.424	1.424	0.002	0.002	1.424	1.424	42.985		
									19-Dec-2017	1.735	1.711	1.705	0.030	0.024	1.711	1.711	42.698		
RB-OBS28	**Active**	600490.000	7241263.400	51.38	52.22	15.90	6.70 - 15.90	4.00 - 15.90	14-Mar-2017	9.640	8.750	9.578	0.062	0.050	9.590	8.750	42.630	N/M	Shale/sandstone/siltstone
									11-Apr-2017	9.810	8.858	9.670	0.140	0.112	9.698	8.858	42.522		
									15-Jun-2017	8.590	7.686	8.510	0.080	0.064	8.526	7.686	43.694		
									15-Jul-2017	8.830	7.934	8.760	0.070	0.056	8.774	7.934	43.446		
									19-Aug-2017	9.032	8.154	8.984	0.048	0.038	8.994	8.154	43.226		
									15-Sep-2017	5.805	4.929	5.760	0.045	0.036	5.769	4.929	46.451		
									14-Oct-2017	8.835	7.964	8.796	0.039	0.031	8.804	7.964	43.416		
									21-Nov-2017	9.016	8.169	9.007	0.009	0.007	9.009	8.169	43.211		
RB-OBS35	**Active**	600492.080	7241257.300	51.05	51.82	16.20	2.40 - 16.20	1.50 - 16.20	14-Mar-2017	9.703	8.913	9.683	0.020	0.016	9.687	8.913	42.137	N/M	Sandy silt/siltstone/sandstone
									11-Apr-2017	9.900	9.086	9.850	0.050	0.040	9.860	9.086	41.964		
									15-Jun-2017	7.870	7.048	7.810	0.060	0.048	7.822	7.048	44.002		
									15-Jul-2017	8.250	7.396	8.150	0.100	0.080	8.170	7.396	43.654		
									19-Aug-2017	8.595	7.781	8.545	0.050	0.040	8.555	7.781	43.269		
									15-Sep-2017	8.300	7.498	8.265	0.035	0.028	8.272	7.498	43.552		
									14-Oct-2017	8.252	7.451	8.218	0.034	0.027	8.225	7.451	43.599		
									21-Nov-2017	8.485	7.699	8.470	0.015	0.012	8.473	7.699	43.351		
RB-OBS36	**Active**	600506.020	7241253.800	51.07	51.69	16.00	3.80 - 16.00	2.40 - 16.00	14-Mar-2017	9.646	9.028	9.644	0.002	0.002	9.644	9.028	42.042	N/M	Sandy silt/siltstone/sandstone
									11-Apr-2017	10.010	9.250	9.830	0.180	0.144	9.866	9.250	41.820		
									15-Jun-2017	7.780	7.140	7.750	0.030	0.024	7.756	7.140	43.930		
									15-Jul-2017	8.120	7.488	8.100	0.020	0.016	8.104	7.488	43.582		
									19-Aug-2017	8.515	7.891	8.505	0.010	0.008	8.507	7.891	43.179		
									15-Sep-2017	8.277	7.657	8.272	0.005	0.004	8.273	7.657	43.413		
									14-Oct-2017	8.257	7.639	8.255	0.002	0.002	8.255	7.639	43.431		
									21-Nov-2017	8.523	7.905	8.520	0.003	0.002	8.521	7.905	43.165		
RB-RW-13	**Active**	600504.617	7241231.131	47.54	48.26	8.94	2.50 - 8.60	2.50 - 8.60	14-Mar-2017	5.34	4.62	N/M	N/A	N/A	5.34	4.62	42.92	N/M	Sand/gravel/siltstone
									11-Apr-2017	5.32	4.60	N/M	N/A	N/A	5.32	4.60	42.94		
									15-Jun-2017	1.86	1.14	N/M	N/A	N/A	1.86	1.14	46.40		
									16-Jul-2017	2.52	1.80	N/M	N/A	N/A	2.52	1.80	45.74		
									19-Aug-2017	3.76	3.04	N/M	N/A	N/A	3.76	3.04	44.50		
									15-Sep-2017	3.74	3.02	N/M	N/A	N/A	3.74	3.02	44.52		
									14-Oct-2017	3.63	2.91	N/M	N/A	N/A	3.63	2.91	44.63		
									21-Nov-2017	4.01	3.29	N/M	N/A	N/A	4.01	3.29	44.25		
									20-Dec-2017	4.16	3.44	N/M	N/A	N/A	4.16	3.44	44.10		

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
RB-RW-3	**Active**	600487.364	7241230.744	47.01	47.66	8.55	1.10 - 8.60	0.80 - 8.55	15-Jun-2017	2.850	2.157	2.790	0.060	0.048	2.802	2.157	44.853	N/M	Sand/gravel/siltstone
									15-Jul-2017	3.530	2.837	3.470	0.060	0.048	3.482	2.837	44.173		
									19-Aug-2017	3.902	3.250	3.893	0.009	0.007	3.895	3.250	43.760		
									15-Sep-2017	3.670	3.017	3.660	0.010	0.008	3.662	3.017	43.993		
									21-Nov-2017	4.155	3.502	4.145	0.010	0.008	4.147	3.502	43.508		
RB-RW-5	**Active**	600513.349	7241232.437	48.23	48.89	9.52	1.80 - 9.30	1.20 - 9.52	14-Mar-2017	6.84	6.18	N/M	N/A	N/A	6.84	6.18	42.05	N/M	Sand/gravel/siltstone
									11-Apr-2017	6.71	6.05	N/M	N/A	N/A	6.71	6.05	42.18		
									16-Jun-2017	3.64	2.98	N/M	N/A	N/A	3.64	2.98	45.25		
									15-Jul-2017	4.33	3.67	N/M	N/A	N/A	4.33	3.67	44.56		
									19-Aug-2017	5.02	4.36	N/M	N/A	N/A	5.02	4.36	43.87		
									15-Sep-2017	4.84	4.18	N/M	N/A	N/A	4.84	4.18	44.05		
									14-Oct-2017	5.05	4.39	N/M	N/A	N/A	5.05	4.39	43.84		
									21-Nov-2017	5.47	4.81	N/M	N/A	N/A	5.47	4.81	43.42		
									20-Dec-2017	5.74	5.08	N/M	N/A	N/A	5.74	5.08	43.15		
RB-RW-8	**Active**	600434.648	7241246.702	45.87	46.39	8.09	2.60 - 7.80	2.60 - 7.80	14-Mar-2017	3.63	3.11	N/M	N/A	N/A	3.63	3.11	42.76	N/M	Silty clay / siltstone
									15-Jun-2017	1.110	0.574	1.090	0.020	0.016	1.094	0.574	45.296		
									16-Jul-2017	1.76	1.24	N/M	N/A	N/A	1.76	1.24	44.63		
									19-Aug-2017	2.09	1.57	N/M	N/A	N/A	2.09	1.57	44.30		
									14-Sep-2017	1.92	1.40	N/M	N/A	N/A	1.92	1.40	44.47		
									14-Oct-2017	1.90	1.38	N/M	N/A	N/A	1.90	1.38	44.49		
									21-Nov-2017	2.22	1.70	N/M	N/A	N/A	2.22	1.70	44.17		
									20-Dec-2017	2.49	1.97	N/M	N/A	N/A	2.49	1.97	43.90		
RB-RW-9	**Active**	600456.161	7241234.880	47.64	48.35	8.77	2.30 - 8.40	2.30 - 8.40	14-Mar-2017	5.42	4.71	N/M	N/A	N/A	5.42	4.71	42.93	N/M	Silt/sand/gravel/siltstone
									11-Apr-2017	5.40	4.69	N/M	N/A	N/A	5.40	4.69	42.95		
									15-Jun-2017	1.78	1.07	N/M	N/A	N/A	1.78	1.07	46.57		
									16-Jul-2017	2.84	2.13	N/M	N/A	N/A	2.84	2.13	45.51		
									19-Aug-2017	3.36	2.65	N/M	N/A	N/A	3.36	2.65	44.99		
									14-Sep-2017	3.19	2.48	N/M	N/A	N/A	3.19	2.48	45.16		
									14-Oct-2017	3.39	2.68	N/M	N/A	N/A	3.39	2.68	44.96		
									22-Nov-2017	3.72	3.01	N/M	N/A	N/A	3.72	3.01	44.63		
									20-Dec-2017	4.03	3.32	N/M	N/A	N/A	4.03	3.32	44.32		
Former Reduced Crude Flare Pit																			
RCF 03-1-5	**Active**	600644.136	7241821.599	63.79	64.49	4.60	N/A	1.00 - 4.60	21-Aug-2017	2.20	1.50	N/M	N/A	N/A	2.20	1.50	62.29	2.2e-006	Silt and peat
RCF 98-3-4	**Active**	600653.339	7241795.122	64.18	65.03	4.30	1.30 - 4.30	1.00 - 4.30	21-Aug-2017	2.88	2.03	N/M	N/A	N/A	2.88	2.03	62.15	2.6e-006	Silt/sand/peat
B-35X Well Site																			
B35X-12-1-3	**Active**	600022.512	7241854.845	64.40	65.11	2.50	1.00 - 2.50	0.60 - 2.50	12-Aug-2017	2.11	1.40	N/M	N/A	N/A	2.11	1.40	63.00	7.5e-007	Fill/Sand/Peat
B35X-12-3-3	**Active**	599998.897	7241853.504	64.56	65.31	3.70	1.50 - 3.00	1.10 - 3.00	12-Aug-2017	1.77	1.02	N/M	N/A	N/A	1.77	1.02	63.54	1.00E-06	Fill/Sand/Peat
B35X-12-2-3	**Active**	600004.184	7241868.259	64.22	64.95	2.70	1.20 - 2.70	0.80 - 2.70	12-Aug-2017	1.53	0.80	N/M	N/A	N/A	1.53	0.80	63.42	8.6e-007	Fill/Peat/Sand
B-38X/FTA Area																			
B38 02-17-3	**Active**	600352.000	7241465.800	58.81	59.51	3.00	1.00 - 3.00	0.60 - 3.00	13-Aug-2017	> 3.18	> 2.48	N/M	N/A	N/A	> 3.18	> 2.48	< 56.33	5.9e-008	
B38 03-38-5	**Active**	600505.002	7241460.656	58.37	58.97	4.60	1.40 - 4.60	1.40 - 4.60	13-Aug-2017	1.34	0.74	N/M	N/A	N/A	1.34	0.74	57.63	4.1e-006	Silty and sandy clay
B38 08-2-4	**Active**	600296.350	7241580.328	63.59	64.31	3.60	2.10 - 3.60	1.80 - 3.60	13-Aug-2017	> 4.41	> 3.69	N/M	N/A	N/A	> 4.41	> 3.69	< 59.90	2e-007	Clayey sandy silt

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
B38-10-2-5	**Active**	600147.215	7241631.909	63.18	63.92	4.70	1.70 - 4.70	1.50 - 4.70	18-Aug-2017	2.25	1.51	N/M	N/A	N/A	2.25	1.51	61.67	1.7e-006	Clayey Silt
B38-10-1-5	**Active**	600188.275	7241625.351	63.27	64.06	4.50	1.50 - 4.50	1.20 - 4.50	18-Aug-2017	1.88	1.09	N/M	N/A	N/A	1.88	1.09	62.18	2.1e-006	Clayey Silt
B38-16-1-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	12-Aug-2017	1.50	N/A	N/M	N/A	N/A	1.50	N/A	N/A	N/M	
B38-16-2-4	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	12-Aug-2017	4.497	N/A	1.467	3.030	2.424	2.073	N/A	N/A	N/M	
FTA 98-4-5	**Active**	600478.469	7241655.771	63.30	63.84	4.60	1.46 - 4.46	1.00 - 4.60	13-Aug-2017	2.56	2.02	N/M	N/A	N/A	2.56	2.02	61.28	>1.1E-06	Silt and sand
FTA 99-2-4	**Active**	600439.638	7241661.403	63.86	64.52	4.40	1.40 - 4.40	1.00 - 4.40	13-Aug-2017	3.108	2.446	3.105	0.003	0.002	3.106	2.446	61.414	7.1e-007	Silt and sand
FTA 99-3-4	**Active**	600501.251	7241674.947	64.15	64.79	4.10	1.10 - 4.10	0.90 - 4.10	17-Aug-2017	2.96	2.32	N/M	N/A	N/A	2.96	2.32	61.83	1.8e-006	Peat, silt and sand
FTA 99-6-12	**Active**	N/M	N/M	63.08	63.63	12.40	9.35 - 12.40	8.90 - 12.40	13-Aug-2017	2.69	2.14	N/M	N/A	N/A	2.69	2.14	60.94	3.7e-007	Siltstone
Mainland Tank Farm																			
MTF 97-1-5	**Active**	600924.768	7241588.497	63.49	64.39	4.70	1.70 - 4.70	1.10 - 4.70	17-Aug-2017 14-Sep-2017	4.30 4.13	3.39 3.22	N/M N/M	N/A N/A	N/A N/A	4.30 4.13	3.39 3.22	60.09 60.26	>1.0E-05	Silt
MTF 98-4-5	**Active**	600600.070	7241469.950	59.14	59.84	5.10	2.10 - 5.10	1.40 - 5.10	17-Aug-2017	1.70	1.00	N/M	N/A	N/A	1.70	1.00	58.14	1.1e-006	Sandy silt
MTF 98-5-4	**Active**	600579.020	7241492.700	59.35	60.10	2.80	1.30 - 2.80	1.90 - 4.00	17-Aug-2017	0.53	-0.22	N/M	N/A	N/A	0.53	-0.22	59.57	3.1e-006	Silt, sandy silt
TF 02-10-5	**Active**	600538.459	7241497.380	59.19	59.89	4.40	1.40 - 4.40	1.10 - 4.50	17-Aug-2017	1.65	0.95	N/M	N/A	N/A	1.65	0.95	58.24	N/M	Sandy silt
TF 02-7-3	**Active**	600524.949	7241585.869	62.36	62.96	3.30	1.20 - 3.30	1.00 - 3.50	17-Aug-2017	2.42	1.82	N/M	N/A	N/A	2.42	1.82	60.54	N/M	Sand and silt
TF 02-8-3	**Active**	600581.995	7241579.162	61.81	62.51	3.10	1.10 - 3.10	0.90 - 3.10	17-Aug-2017	1.55	0.85	N/M	N/A	N/A	1.55	0.85	60.96	2.4e-007	Silty clay
TF 02-9-3	**Active**	600511.359	7241522.270	60.47	61.27	2.90	0.90 - 2.90	0.80 - 4.00	17-Aug-2017	1.12	0.32	N/M	N/A	N/A	1.12	0.32	60.15	1.6e-005	Silt and gravel
TF 03-11-4	**Active**	600532.221	7241471.152	57.89	58.59	4.30	1.30 - 4.30	1.20 - 4.50	17-Aug-2017	0.66	-0.04	N/M	N/A	N/A	0.66	-0.04	57.93	3.9e-006	Silty clay
TF 03-12-3	**Active**	600562.552	7241435.321	57.08	58.63	2.80	1.00 - 2.80	0.90 - 2.90	17-Aug-2017 13-Sep-2017	1.72 1.73	0.17 0.18	N/M N/M	N/A N/A	N/A N/A	1.72 1.73	0.17 0.18	56.91 56.90	>1.0E-05	Silty clay and shale fill
B-42X Well Site																			
B42-17-1-5	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	1.88	N/A	N/M	N/A	N/A	1.88	N/A	N/A	N/M	
B42-17-2-4	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	1.57	N/A	N/M	N/A	N/A	1.57	N/A	N/A	N/M	
B42-17-3-4	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	14-Oct-2017	1.82	N/A	N/M	N/A	N/A	1.82	N/A	N/A	N/M	
C-36X Well Site																			
C36 09-1-4	**Active**	600054.186	7241617.130	61.01	61.87	4.00	1.00 - 4.00	1.00 - 4.00	12-Aug-2017	2.16	1.30	N/M	N/A	N/A	2.16	1.30	59.71	2.4e-006	Silty sand/silty clay
C36-10-2-3	**Active**	600087.537	7241637.626	62.65	63.45	3.00	1.50 - 3.00	1.20 - 3.00	12-Aug-2017	2.95	2.15	N/M	N/A	N/A	2.95	2.15	60.50	N/M	Clayey Silt
C36-10-1-3	**Active**	600050.878	7241582.428	59.94	60.72	3.00	1.50 - 3.00	1.20 - 3.00	12-Aug-2017	1.34	0.56	N/M	N/A	N/A	1.34	0.56	59.38	N/M	Clayey Silt
C36-10-3-3	**Active**	600048.351	7241644.648	61.55	62.32	3.00	1.50 - 3.00	1.20 - 3.00	12-Aug-2017	2.38	1.62	N/M	N/A	N/A	2.38	1.62	59.94	1.156e-006	Clayey Silt
C-38X Well Site																			
C38 08-1-4	**Active**	600072.804	7241542.767	60.48	61.23	3.80	1.80 - 3.80	1.50 - 3.80	12-Aug-2017 12-Sep-2017	1.97 1.74	1.22 0.99	N/M N/M	N/A N/A	N/A N/A	1.97 1.74	1.22 0.99	59.26 59.49	5.9e-006	Sandy silt/peat/silty clay
Former Fuel Tanks and Former Campsite Area																			
CAB 09-3-3	**Active**	600112.261	7241900.244	64.86	65.65	3.25	N/A	1.15 - 2.65	12-Aug-2017	1.92	1.13	N/M	N/A	N/A	1.92	1.13	63.73	1.2e-005	Sandy silt/silty clay
FT-10-1-3	**Active**	599970.305	7241995.871	65.45	66.17	2.50	1.00 - 2.50	0.80 - 2.70	12-Aug-2017	2.33	1.61	N/M	N/A	N/A	2.33	1.61	63.84	1.684e-006	Silty Gravel / Clayey Silt / Sandy Silt

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
Background/Control Point Locations - Mainland East																			
MEBG-10-1-3	**Active**	600011.383	7241831.078	63.73	64.47	3.00	1.50 - 3.00	1.00 - 3.00	12-Aug-2017	1.02	0.27	N/M	N/A	N/A	1.02	0.27	63.45	9.012e-007	Silty Sand / Clayey Silt
									12-Sep-2017	0.92	0.17	N/M	N/A	N/A	0.92	0.17	63.55		
MEBG-12-2-3	**Active**	600435.204	7242154.560	64.58	65.40	4.50	1.20 - 2.70	0.80 - 3.00	20-Aug-2017	1.24	0.42	N/M	N/A	N/A	1.24	0.42	64.16	3.70E-07	Silty Clay
MEBG-15-4-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	12-Aug-2017	1.67	N/A	N/M	N/A	N/A	1.67	N/A	N/A	N/M	
Mainland Sumps - Mainland Drilling Sump Area																			
MLS 08-1-4	**Unknown**	600199.412	7242322.109	64.87	65.63	3.70	2.20 - 3.70	1.80 - 3.70	16-Aug-2017	2.37	1.61	N/M	N/A	N/A	2.37	1.61	63.26	1.1e-006	Siltstone
MLS 08-2-5	**Unknown**	600254.501	7242353.778	65.32	66.12	5.20	3.80 - 5.20	3.50 - 5.20	16-Aug-2017	2.08	1.28	N/M	N/A	N/A	2.08	1.28	64.04	1.7e-005	Siltstone
MLS 08-3-4	**Unknown**	600276.342	7242296.774	64.86	65.53	3.60	2.10 - 3.60	1.80 - 3.60	16-Aug-2017	2.37	1.70	N/M	N/A	N/A	2.37	1.70	63.16	8.81e-007	Siltstone
MLS-13-1-3	**Active**	600245.483	7242212.730	64.56	65.51	2.80	1.30 - 2.80	1.00 - 3.10	16-Aug-2017	1.67	0.72	N/M	N/A	N/A	1.67	0.72	63.84	5.40E-08	Silty clay/clay sand/silty clay till/siltstone
Mainland Sumps - Well Services Sump Area																			
MLS 02-7-7	**Active**	600455.509	7242256.673	64.92	65.62	7.10	N/A	3.00 - 7.60	16-Aug-2017	1.55	0.85	N/M	N/A	N/A	1.55	0.85	64.07	1.3e-006	Shale
MLS 02-8-8	**Active**	600424.575	7242268.176	64.62	65.27	8.00	N/A	3.20 - 8.30	16-Aug-2017	1.98	1.33	N/M	N/A	N/A	1.98	1.33	63.29	4.4e-007	Shale
MLS 02-9-8	**Active**	600388.797	7242286.342	65.07	65.87	8.30	N/A	5.00 - 9.10	16-Aug-2017	2.52	1.72	N/M	N/A	N/A	2.52	1.72	63.35	7.5e-009	Rafted shale
MLS 02-10-8	**Active**	600393.142	7242316.570	65.23	65.93	9.10	N/A	5.00 - 9.10	16-Aug-2017	2.25	1.55	N/M	N/A	N/A	2.25	1.55	63.68	5.5e-008	Shale
MLS 09-9-2	**Active**	600375.294	7242332.809	65.10	65.92	2.50	N/A	0.80 - 2.30	16-Aug-2017	1.97	1.15	N/M	N/A	N/A	1.97	1.15	63.95	3.4e-006	Sandy silt/silty clay
MLS-10-2-3	**Active**	600459.515	7242329.339	65.50	66.27	2.55	1.05 - 2.55	0.85 - 2.55	16-Aug-2017	2.32	1.55	N/M	N/A	N/A	2.32	1.55	63.95	9.892e-007	Weathered Siltstone / Siltstone
MLS-13-3-3	**Active**	600388.870	7242248.362	64.17	65.19	2.40	0.90 - 2.40	0.60 - 2.55	16-Aug-2017	1.30	0.28	N/M	N/A	N/A	1.30	0.28	63.89	1.70E-07	
MLS-13-4-3	**Active**	600500.275	7242199.012	64.28	65.25	2.70	1.20 - 2.70	0.90 - 3.00	16-Aug-2017	1.28	0.31	N/M	N/A	N/A	1.28	0.31	63.97	6.90E-07	
Mainland Sumps - Sumps 1 Through 6																			
MLS 02-5-8	**Active**	600532.941	7242368.381	65.70	66.40	8.00	6.00 - 8.00	5.00 - 10.00	16-Aug-2017	2.30	1.60	N/M	N/A	N/A	2.30	1.60	64.10	2.1e-006	Shale
MLS 09-1-3	**Active**	600486.140	7242673.987	65.21	66.09	2.45	0.95 - 2.45	0.70 - 3.00	16-Aug-2017	2.35	1.47	N/M	N/A	N/A	2.35	1.47	63.74	2.7e-006	Silty clay/silt
MLS 09-2-3	**Active**	600424.914	7242686.285	65.08	65.92	2.70	1.20 - 2.70	1.00 - 2.90	16-Aug-2017	2.12	1.28	N/M	N/A	N/A	2.12	1.28	63.80	5.28e-007	Silty clay
MLS 09-5-3	**Active**	600441.544	7242471.837	65.92	66.76	2.60	1.10 - 2.60	0.90 - 2.95	16-Aug-2017	2.44	1.60	N/M	N/A	N/A	2.44	1.60	64.32	7.1e-006	Silty clay and sand/silty clay
MLS 09-7-2	**Active**	600615.793	7242607.168	64.96	65.94	2.00	1.00 - 2.00	0.80 - 2.25	16-Aug-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	9.9e-008	Silty clay/siltstone
MLS 09-15-3	**Active**	600357.970	7242582.492	66.30	67.21	2.50	1.00 - 2.50	0.80 - 2.80	16-Aug-2017	3.06	2.15	N/M	N/A	N/A	3.06	2.15	64.15	4.8e-007	Fill/silty clay
MLS-10-1-7	**Active**	600271.991	7242501.601	65.17	65.98	7.02	4.02 - 7.02	3.70 - 7.02	16-Aug-2017	1.80	0.99	N/M	N/A	N/A	1.80	0.99	64.18	1.4e-006	Siltstone
MLS-13-2-3	**Active**	600662.728	7242321.656	65.12	66.03	2.7	1.20-2.70	0.90-3.00	16-Aug-2017	2.71	1.81	N/M	N/A	N/A	2.71	1.81	63.32	N/M	Clay Till/Siltstone
MLS-13-9-3	**Active**	600149.08	7242407.98	65.14	N/M	2.4	0.90-2.40	0.60-3.00	16-Aug-2017	1.23	N/A	N/M	N/A	N/A	1.23	N/A	N/A	N/M	Clay Till
MLS-14-2-3	**Active**	600705.25	7242466.84	65.86	66.91	2.5	1.00 - 2.50	1.00 - 2.50	16-Aug-2017	2.01	N/A	N/M	N/A	N/A	2.01	N/A	N/A	N/M	Silt/Silty Clay
MLS-14-5-4	**Active**	600627.18	7242652.65	64.75	65.63	3.8	2.30 - 3.80	2.30 - 3.80	16-Aug-2017	1.44	N/A	N/M	N/A	N/A	1.44	N/A	N/A	N/M	Sand/Clayey Silt

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
Cemetery Sump																			
CEM 08-2-5	**Active**	598350.249	7241810.575	59.37	60.05	5.20	2.20 - 5.20	1.80 - 5.20	17-Aug-2017	> 6.16	> 5.48	N/M	N/A	N/A	> 6.16	> 5.48	< 53.89	1e-006	Sandy clay
CEM 08-4-5	**Active**	598383.529	7241797.726	59.08	59.24	5.30	2.30 - 5.30	1.90 - 5.30	17-Aug-2017	> 5.25	> 5.09	N/M	N/A	N/A	> 5.25	> 5.09	< 53.99	1.8e-006	Clayey sand/silty clay/bedrock
CEM 09-1-4	**Active**	598360.264	7241773.840	58.00	58.66	4.50	0.70 - 4.50	0.40 - 4.50	17-Aug-2017	> 5.06	> 4.40	N/M	N/A	N/A	> 5.06	> 4.40	< 53.60	1.18e-006	Silt and clay/silty clay/sandy silt
CEM 09-3-2	**Active**	598354.454	7241860.868	59.25	60.00	2.20	0.70 - 2.20	0.50 - 2.50	17-Aug-2017	2.86	2.11	N/M	N/A	N/A	2.86	2.11	57.14	4.476e-007	Silt/loam/clayey silt
C-27X Sump																			
C27 08-1-4	**Active**	599071.801	7242094.054	61.81	62.59	4.00	1.00 - 4.00	0.70 - 4.00	13-Aug-2017	1.87	1.09	N/M	N/A	N/A	1.87	1.09	60.72	7.2e-006	Silty clay
C27-16-1-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	15-Aug-2017	> 3.67	N/A	N/M	N/A	N/A	> 3.67	N/A	N/A	N/M	
C27-16-2-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	15-Aug-2017	1.88	N/A	N/M	N/A	N/A	1.88	N/A	N/A	N/M	
C27-16-3-4	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	13-Aug-2017	> 5.05	N/A	N/M	N/A	N/A	> 5.05	N/A	N/A	N/M	
C27-16-4-3	**Active**	N/M	N/M	N/M	N/M	N/A	N/A	N/A	13-Aug-2017	2.08	N/A	N/M	N/A	N/A	2.08	N/A	N/A	N/M	
Bear Island 1X Drill Pad																			
BI1-12-2-7	**Active**	597001.878	7238139.938	47.30	48.04	7.40	4.40 - 7.40	4.00 - 7.40	15-Aug-2017	> 2.13	> 1.39	N/M	N/A	N/A	> 2.13	> 1.39	< 45.91	N/M	Sand/Silty Sand
BI1-12-3-7	**Active**	597079.612	7238192.317	46.62	47.37	7.50	4.50 - 7.50	4.10 - 7.50	15-Aug-2017	> 4.38	> 3.63	N/M	N/A	N/A	> 4.38	> 3.63	< 42.99	N/M	Sandy Silt/Sand
Bear Island BT1																			
BI BT1 09-1-4	**Active**	597991.224	7238618.913	50.60	51.37	4.40	1.40 - 4.40	1.25 - 4.40	10-Aug-2017	3.05	2.28	N/M	N/A	N/A	3.05	2.28	48.32	3.7e-007	Silt/sandy silt/silty sand
BIBT1-15-1-3.5	**Active**	598047.130	7238625.480	50.66	51.39	3.50	2.00 - 3.50	1.70 - 3.80	10-Aug-2017	2.87	2.14	N/M	N/A	N/A	2.87	2.14	48.52	N/M	Sandy silt/silty clay
BIBT1-15-2-4	**Active**	598018.090	7238608.390	50.81	51.68	3.70	2.20 - 3.70	2.00 - 3.70	10-Aug-2017	3.22	2.35	N/M	N/A	N/A	3.22	2.35	48.46	N/M	Sandy silt
BIBT1-15-4-4	**Active**	597946.160	7238656.600	45.45	45.54	3.80	2.30 - 3.80	2.00 - 3.80	10-Aug-2017	3.51	3.42	N/M	N/A	N/A	3.51	3.42	42.03	N/M	Silty sand
BIBT1-15-5-3	**Active**	597962.690	7238680.830	43.24	43.25	3.30	1.80 - 3.30	1.50 - 3.30	10-Aug-2017	1.21	1.20	N/M	N/A	N/A	1.21	1.20	42.04	N/M	Sand
BIBT1-15-7-4	**Active**	598005.100	7238694.500	44.68	44.76	3.70	2.20 - 3.70	2.00 - 3.70	10-Aug-2017	2.54	2.46	N/M	N/A	N/A	2.54	2.46	42.22	N/M	Sand
BIBT1-15-8-4	**Destroyed**	598052.860	7238696.400	46.76	47.15	4.10	2.60 - 4.10	2.40 - 4.10	10-Aug-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	N/M	Silt/silty sand
BIBT1-16-1-3	**Active**	N/M	N/M	N/M	N/M	3.00	1.50 - 3.00	1.40 - 3.10	11-Aug-2017	1.21	N/A	N/M	N/A	N/A	1.21	N/A	N/A	N/M	Silty sand
BIBT1-16-2-3	**Active**	N/M	N/M	N/M	N/M	3.00	1.40 - 2.90	1.20 - 3.00	11-Aug-2017	0.83	N/A	N/M	N/A	N/A	0.83	N/A	N/A	N/M	Sand and silt/silty sand
BIBT1-16-3-3	**Active**	N/M	N/M	N/M	N/M	3.00	1.40 - 2.90	1.20 - 3.00	11-Aug-2017	0.64	N/A	N/M	N/A	N/A	0.64	N/A	N/A	N/M	Sand/silty sand/silt/sandy silt
BI-14-13-3	**Active**	597987.56	7238728.65	42.45	43.88	3.14	1.62 - 3.14	1.62 - 3.14	10-Aug-2017	0.65	N/A	N/M	N/A	N/A	0.65	N/A	N/A	1.60E-06	Silty sand/clay/sand
Bear Island West Sumps (Sumps 1-5)																			
BI 08-6-4	**Active**	598121.740	7238557.818	50.69	51.54	3.80	2.30 - 3.80	1.00 - 3.80	11-Aug-2017	2.66	1.81	N/M	N/A	N/A	2.66	1.81	48.88	6.2e-008	Clayey silt/silty clay
BI 08-7-2	**Active**	598048.262	7238531.775	50.83	51.33	1.80	0.30 - 1.80	0.80 - 1.80	11-Aug-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A	4.7e-006	Clayey silt
BI 08-8-4	**Active**	598147.295	7238420.140	49.73	50.48	3.80	2.30 - 3.80	1.70 - 3.80	11-Aug-2017	1.40	0.65	N/M	N/A	N/A	1.40	0.65	49.08	8.8e-008	Debris/sand
BI DP 08-5	**Active**	598194.188	7238539.586	50.62	51.35	1.23	0.90 - 1.20	0.90 - 1.20	11-Aug-2017	1.67	0.94	N/M	N/A	N/A	1.67	0.94	49.68	N/M	
BI-13-18-3	**Active**	598235.587	7238709.120	50.06	50.96	N/A	0.90 - 2.40	0.60 - 2.70	14-Aug-2017	> 1.83	> 0.93	N/M	N/A	N/A	> 1.83	> 0.93	< 49.13	N/M	
BI-13-5-2	**Active**	598357.004	7238369.507	50.56	51.48	N/A	0.90 - 2.40	0.60 - 2.70	14-Aug-2017	> 1.87	> 0.95	N/M	N/A	N/A	> 1.87	> 0.95	< 49.61	3.70E-07	
BI-13-6-2	**Active**	N/M	N/M	N/M	N/M	N/A	0.90 - 2.40	0.60 - 2.70	14-Aug-2017	> 1.90	N/A	N/M	N/A	N/A	> 1.90	N/A	N/A	N/M	

Advisian
WorleyParsons Group

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
BIS 97-1-3	**Active**	598365.067	7238610.352	51.00	51.93	2.60	N/A	0.60 - 2.60	22-Nov-2017	1.82	0.89	N/M	N/A	N/A	1.82	0.89	50.11	6.5e-005	Silty peat/silt
BIS-10-3-DP	**Active**	598020.469	7238339.298	50.05	50.94	0.63	0.33 - 0.63	0.30 - 0.60	11-Aug-2017	1.30	0.41	N/M	N/A	N/A	1.30	0.41	49.64	N/M	Peat with Clay
BIS-16-1-3	**Active**	598046.470	7238576.910	50.58	51.69	3.2	1.70 - 3.20	1.00 - 3.20	10-Aug-2017	2.63	1.52	N/M	N/A	N/A	2.63	1.52	49.06	N/M	Clay
BIS-16-7-5	**Active**	598179.470	7238344.100	49.43	50.41	4.6	3.10 - 4.60	2.75 - 4.60	11-Aug-2017	1.56	0.58	N/M	N/A	N/A	1.56	0.58	48.85	N/M	Clayey Sand/Sand
BIS-16-8-3	**Active**	598008.520	7238296.390	49.31	50.32	2.6	1.00 - 2.50	0.85 - 2.60	11-Aug-2017	1.40	0.39	N/M	N/A	N/A	1.40	0.39	48.92	N/M	Silty Clay
BIS-16-10-4	**Active**	598449.880	7238463.760	50.64	51.40	3.75	2.25 - 3.75	2.00 - 3.75	11-Aug-2017	2.56	1.80	N/M	N/A	N/A	2.56	1.80	48.84	N/M	Sandy Clay
BIS-16-11-4	**Active**	598348.040	7238446.540	51.17	52.09	3.9	2.40 - 3.90	2.03 - 3.90	11-Aug-2017	2.64	1.72	N/M	N/A	N/A	2.64	1.72	49.45	N/M	Sandy Clay/Clayey Sand
BIS-16-12-5	**Active**	598182.480	7238336.220	49.31	50.29	4.6	3.10 - 4.60	2.00 - 4.60	11-Aug-2017	1.48	0.50	N/M	N/A	N/A	1.48	0.50	48.81	N/M	Clayey Sand/Sand
Bear Island Flare Pit																			
BIFP-16-1-3	**Active**	599218.780	7238901.900	46.17	46.57	3	1.50 - 3.00	1.20 - 3.20	10-Aug-2017	1.94	N/A	N/M	N/A	N/A	1.94	N/A	N/A	N/M	Clayey Silt/Sand and Silt/Sand
BIFP-16-2-3	**Active**	599218.290	7238892.080	46.64	46.79	3	1.50 - 3.00	1.20 - 3.20	10-Aug-2017	2.05	N/A	N/M	N/A	N/A	2.05	N/A	N/A	N/M	Clayey Silt/Sand and Silt/Sand
BIFP-16-3-3	**Active**	N/M	N/M	N/M	N/M	3	1.50 - 3.00	1.40 - 3.10	10-Aug-2017	1.92	N/A	N/M	N/A	N/A	1.92	N/A	N/A	N/M	Sandy Silt/Sand
Former Bear Island Battery and N-42X Well Site																			
BIB 98-2-5	**Active**	599104.786	7238803.564	50.39	50.99	4.00	2.50 - 4.00	2.00 - 5.20	10-Aug-2017	2.90	2.30	N/M	N/A	N/A	2.90	2.30	48.09	4.40E-07	Clay silt
BIN42-10-1-5	**Active**	599122.102	7238734.015	51.23	51.98	4.50	1.50 - 4.50	1.20 - 4.50	10-Aug-2017	2.71	1.96	N/M	N/A	N/A	2.71	1.96	49.27	1.6e-006	Clayey Silt
BIN42-10-2-4	**Active**	599203.662	7238718.517	50.93	51.71	3.50	2.00 - 3.50	1.80 - 3.50	10-Aug-2017	> 4.31	> 3.53	N/M	N/A	N/A	> 4.31	> 3.53	< 47.40	N/M	Sandy Silt
Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites																			
BI O46-09-DP-1	**Active**	599571.975	7238382.952	48.85	49.35	1.50	0.80 - 1.10	0.80 - 1.10	14-Aug-2017	1.06	0.56	N/M	N/A	N/A	1.06	0.56	48.29	N/M	Silty clay
BISS2-09-DP-1	**Active**	599589.685	7238756.721	44.66	45.13	1.20	0.80 - 1.10	0.80 - 1.10	14-Aug-2017	0.29	-0.18	N/M	N/A	N/A	0.29	-0.18	44.84	N/M	Silty clay/silty clay with sand inclusions
									12-Sep-2017	0.92	0.45	N/M	N/A	N/A	0.92	0.45	44.21		
BISS2-09-DP-2	**Active**	599558.246	7238743.607	44.87	45.25	1.20	0.80 - 1.10	0.80 - 1.10	14-Aug-2017	1.09	0.71	N/M	N/A	N/A	1.09	0.71	44.16	N/M	Silty sand
									12-Sep-2017	0.06	-0.32	N/M	N/A	N/A	0.06	-0.32	45.19		
BISS3-09-DP-1	**Active**	599537.730	7238454.320	48.80	49.21	1.25	0.90 - 1.20	0.86 - 1.16	14-Aug-2017	1.13	0.72	N/M	N/A	N/A	1.13	0.72	48.08	N/M	Silty clay
BISS3-09-DP-2	**Active**	599531.465	7238479.334	48.75	49.09	1.25	0.90 - 1.20	0.88 - 1.18	14-Aug-2017	1.33	0.99	N/M	N/A	N/A	1.33	0.99	47.76	N/M	
Bear Island East Sump (Sump 6)																			
BI 08-2-3	**Active**	599951.81	7238379.41	51.02	51.72	3.10	1.60 - 3.10	1.20 - 3.10	15-Aug-2017	3.16	2.46	N/M	N/A	N/A	3.16	2.46	48.56	3.4e-006	Silty sand/silty clay
BI-13-1-4	**Active**	599964.584	7238301.752	49.70	49.70	N/A	1.30 - 4.30	1.00 - 4.60	15-Aug-2017	1.30	1.30	N/M	N/A	N/A	1.30	1.30	48.40	2.60E-06	
									22-Nov-2017	1.89	1.89	N/M	N/A	N/A	1.89	1.89	47.81		
BI-13-2-4.5	**Active**	599855.312	7238313.048	49.48	50.48	N/A	1.50 - 4.50	1.20 - 4.80	15-Aug-2017	1.68	0.68	N/M	N/A	N/A	1.68	0.68	48.80	8.50E-07	
BI-13-3-4.5	**Active**	599813.864	7238463.124	50.62	51.57	N/A	1.50 - 4.50	1.20 - 4.80	15-Aug-2017	1.81	0.86	N/M	N/A	N/A	1.81	0.86	49.76	1.40E-06	
									22-Nov-2017	N/M	N/M	N/M	N/A	N/A	N/A	N/A	N/A		
BI-13-4-1.5	**Active**	599895.061	7238604.703	45.62	46.62	N/A	1.00 - 2.50	0.70 - 2.80	15-Aug-2017	> 1.44	> 0.44	N/M	N/A	N/A	> 1.44	> 0.44	< 45.18	1.40E-06	
BIWS-16-1-4	**Active**	N/M	N/M	N/M	N/M	4	2.50 - 4.00	2.20 - 4.10	15-Aug-2017	1.11	N/A	N/M	N/A	N/A	1.11	N/A	N/A	N/M	Sandy Silt/Sand/Sand and Silt/Clayey Silt

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 407011-00622-300

Monitoring Station	Status	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Observed Depth to Groundwater (mbtoc)	Observed Depth to Groundwater (mbgs)	Depth to Product (mbtoc)	Observed Product Thickness (m)	Corrected Product Thickness (m)	Corrected Depth to Groundwater (mbtoc)	Corrected Depth to Groundwater (mbgs)	Corrected Groundwater Surface Elevation (masl)	Hydraulic Conductivity (m/s)	Lithology
Background/Control Points - Bear Island																			
BIBG-10-1-4	**Active**	597436.110	7238366.063	50.11	50.89	4.10	1.10 - 4.10	0.78 - 4.10	11-Aug-2017	3.57	2.79	N/M	N/A	N/A	3.57	2.79	47.32	1.90E-06	Silty Clay / Sand
BIBG-12-1-7	**Active**	597275.824	7238297.135	49.40	50.20	7.50	4.20 - 7.20	3.80 - 7.50	15-Aug-2017	> 1.31	> 0.51	N/M	N/A	N/A	> 1.31	> 0.51	< 48.89	N/M	Silty Sand/Sandy Silt
BIBG-12-2-4	**Active**	600179.524	7238170.812	50.65	51.38	6.00	1.00 - 4.00	0.70 - 4.20	15-Aug-2017	2.18	1.45	N/M	N/A	N/A	2.18	1.45	49.20	4.6e-007	Sand/Silty Clay/Sandy Silt
Goose Island																			
GIP9 09-1-4	**Active**	595607.659	7240330.310	47.88	48.33	4.10	1.10 - 1.40	0.90 - 4.10	20-Aug-2017	4.40	3.95	N/M	N/A	N/A	4.40	3.95	43.93	N/M	Silty clay/clayey silt/sandy silt
GIQ8-10-2-4	**Active**	595306.125	7240333.425	47.50	47.72	3.95	0.95 - 3.95	0.75 - 3.70	20-Aug-2017	2.43	2.21	N/M	N/A	N/A	2.43	2.21	45.29	3.3e-006	Sandy Silt
									12-Sep-2017	2.25	2.03	N/M	N/A	N/A	2.25	2.03	45.47		
Background/Control Points - Goose Island																			
GIBG-10-2-3	**Active**	596138.596	7239661.038	43.66	44.20	3.00	1.43 - 3.00	1.30 - 3.00	20-Aug-2017	1.84	1.30	N/M	N/A	N/A	1.84	1.30	42.36	1.7e-005	Sand
									12-Sep-2017	1.65	1.11	N/M	N/A	N/A	1.65	1.11	42.55		

NOTES: 1. Data may be entered to the nearest mm, but are reported above to the nearest cm.
Apparent rounding errors may occasionally occur in calculated fields (e.g. Groundwater Surface Elevation).
2. All coordinates are provided in the UTM Zone 9N referenced to North American Datum of 1927 coordinate system.
3. N/M - Denotes not measured.
4. N/A - Denotes not available.
5. masl - Denotes metres above sea level.
6. mbgs - Denotes metres below ground surface.
7. mbtoc - Denotes metres below top of PVC casing.
8. Where a measurement is not available due to the source being dry, depths and elevations are displayed as greater than the measured depth of well, where available, and where not the installed depth is used.
9. Corrected Depth to Groundwater, and Corrected Groundwater Surface Elevations include corrected product thickness where free product present.
10. Calculations applied to free product are based off a Specific Gravity of 0.8.

Advisian
WorleyParsons Group

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
CCME CEQG Freshwater Aquatic Life [#1]		---	**6.5 - 9.0**	---
Central Processing Facility (CPF)				
CPF 09-3-5	15-Aug-2017	1392	7.13	12.4
	17-Aug-2017	1642	6.60	10.3
CPF 09-6-19	17-Aug-2017	1573	6.95	6.1
CPF 97-2-7	17-Aug-2017	2000	6.98	5.5
CPF 97-7-5	17-Aug-2017	1655	**6.43 [#1]**	11.1
	12-Sep-2017	1786	6.67	9.3
CPF 98-3-5	17-Aug-2017	1425	6.64	8.7
CPF 98-6-3	17-Aug-2017	1732	6.74	7.5
CPF 98-8-3	12-Sep-2017	1101	6.56	5.0
E-27X Well Site				
E27 09-2-16	20-Aug-2017	2720	7.23	6.6
Background/Control Point Locations - Mainland West				
MWBG-10-1-3	17-Aug-2017	1515	6.74	7.2
Former Battery #3 and Battery #3 Flare Pit				
BT3 02-34-4	13-Aug-2017	2620	6.72	8.2
BT3 97-11-11	13-Aug-2017	4290	7.16	6.7
BT3 99-20-13	13-Aug-2017	2120	7.02	9.0
BT3 99-21-12	13-Aug-2017	1690	7.13	18.6
BT3 99-23-13	13-Aug-2017	12590	6.68	6.3
Biocells, ARB and B-33X Area				
ARB-10-2-3	12-Aug-2017	653	7.12	9.0
ARB-12-4-2	12-Aug-2017	871	7.03	10.1
ARB-12-3-3	12-Aug-2017	1046	6.76	6.5
ARB-12-1-4	12-Aug-2017	732	7.45	6.8
ARB-13-1-4.5	12-Aug-2017	1207	6.79	7.6
ARB-13-3-4.5	12-Aug-2017	1316	7.28	11.3
ARB-13-5-4.5	12-Aug-2017	1344	6.95	7.8
ARB-16-1-3	12-Aug-2017	997	6.92	5.9
ARB-17-1-3	15-Oct-2017	650	**6.45 [#1]**	4.8

Advisian
WorleyParsons Group

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
ARB-17-2-3	15-Oct-2017	1473	**6.20** [#1]	4.7
ARB-17-3-5	15-Oct-2017	1432	**6.32** [#1]	6.2
BC2-15-1-3	12-Aug-2017	904	6.60	4.6
BC2-15-2-4	12-Aug-2017	824	6.82	6.5
BC2-15-3-4	12-Aug-2017	738	6.88	6.8
BC2-15-4-3	12-Aug-2017	1032	7.09	6.8
G-32X Well Site				
G32-10-1-3	17-Aug-2017	1701	6.54	12.1
B-30X Well Site				
B30-13-1-5.4	13-Aug-2017	1164	6.91	9.5
B30-13-2-4.5	13-Aug-2017	1265	6.62	5.4
B30-13-3-4.5	13-Aug-2017	2110	6.82	7.5
B30-13-4-3.9	18-Aug-2017	456	7.30	10.4
B30-17-1-5	15-Oct-2017	1093	7.20	3.7
B30X-12-2-4	13-Aug-2017	1674	6.81	12.0
B30X-12-3-4	13-Aug-2017	2220	7.03	9.2
Well Services/Warehouse Yard				
WSY 97-1-5	18-Aug-2017	1598	6.60	8.2
	12-Sep-2017	1873	6.69	6.3
WSY 97-2-4	13-Aug-2017	1230	6.88	6.4
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area				
BOS-DP-13-2-1.35	16-Aug-2017	1173	6.56	10.2
BOS-DP-13-4-3	16-Aug-2017	1129	6.77	13.8
C30-10-1-5	12-Aug-2017	2550	6.60	6.4
Background/Control Point Locations - Mainland Central				
MCBG-10-1-3	12-Aug-2017	1094	6.81	7.5
MCBG-12-1-2	20-Aug-2017	1586	6.68	11.6
Former Refinery Area				
NWR 02-15-9	17-Aug-2017	1701	6.54	12.1
NWR 03-42-19	12-Aug-2017	1094	6.81	7.5
NWR 03-43-20	20-Aug-2017	1586	6.68	11.6

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
NWR 09-1-20	12-Aug-2017	1075	6.82	7.1
NWR 09-2-26	13-Aug-2017	8640	7.32	13.2
NWR 09-3-20	13-Aug-2017	1590	7.12	14.4
NWR 09-4-17	13-Aug-2017	1523	7.29	14.0
NWR 09-4-5	16-Jun-2017	909	6.60	7.3
	14-Sep-2017	1184	6.89	10.8
	14-Oct-2017	1.413	**6.25** [#1]	5.3
	21-Nov-2017	1705	6.81	1.9
	19-Dec-2017	1881	6.98	-1
NWR 09-5-19	13-Aug-2017	2800	7.09	15.1
NWR 98-13-21	15-Aug-2017	1392	7.13	12.4
RB-OBS-46	15-Jun-2017	1545	6.70	5.4
	14-Sep-2017	1533	6.82	8.6
	14-Oct-2017	1.293	6.68	6.0
	20-Dec-2017	1552	6.96	-1
RB-OBS-47	19-Aug-2017	1445	6.63	4.4
	14-Sep-2017	1526	6.85	8.7
	14-Oct-2017	1.380	6.53	5.8
RB-13-1-2.4	14-Sep-2017	100	7.12	10.6
RB-13-2-2.4	14-Sep-2017	1406	6.95	15.0
RB-13-4-3	14-Sep-2017	1954	7.01	12.8
RB-MW17-01	16-Jun-2017	1666	6.63	4.2
	19-Aug-2017	1687	**6.26** [#1]	12.5
	14-Sep-2017	1654	6.76	12.5
	14-Oct-2017	1.328	**6.47** [#1]	6.8
	21-Nov-2017	1660	6.65	1.2
	20-Dec-2017	2200	6.87	-1
RB-MW17-02	16-Jun-2017	1748	6.74	6.1
	19-Aug-2017	1758	**6.37** [#1]	12.4
	14-Sep-2017	1616	6.74	11.0
	14-Oct-2017	1.435	6.60	6.2
	21-Nov-2017	1600	6.75	1.9
	20-Dec-2017	1796	6.97	-1

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
RB-MW17-03	16-Jun-2017	1637	6.72	5.7
	19-Aug-2017	1444	**6.43** [#1]	10.4
	14-Sep-2017	1173	6.79	10.2
	14-Oct-2017	1.269	6.63	3.7
	21-Nov-2017	1526	6.70	1.6
	20-Dec-2017	1711	7.00	-1
RB-MW17-04	19-Aug-2017	365	6.96	9.4
	14-Sep-2017	1214	6.93	3.6
	14-Oct-2017	1.240	6.51	3.1
	21-Nov-2017	1428	6.78	1.4
RB-MW17-05	19-Aug-2017	527	6.69	8.6
	14-Sep-2017	980	7.36	7.1
RB-MW17-06	16-Jun-2017	1106	6.91	3.7
	19-Aug-2017	1291	6.62	7.3
	14-Sep-2017	1334	7.14	7.8
	14-Oct-2017	1.461	6.70	3.8
	21-Nov-2017	1660	6.90	0.8
	20-Dec-2017	1777	7.14	-1
RB-MW17-07	16-Jun-2017	1956	6.74	6.6
	19-Aug-2017	1227	6.98	3.4
	14-Sep-2017	855	7.63	5.4
	14-Oct-2017	1.156	6.93	1.9
	21-Nov-2017	1530	6.93	1.3
	20-Dec-2017	2150	6.90	-1
RB-MW17-08	16-Jun-2017	1925	6.70	5.9
	19-Aug-2017	1907	6.73	3.5
	14-Sep-2017	1421	6.91	6.8
	14-Oct-2017	1.556	6.81	4.9
	21-Nov-2017	1789	6.62	2.5
	20-Dec-2017	2090	6.87	-1
RB-MW17-09	16-Jun-2017	1804	6.74	5.8
	19-Aug-2017	1732	6.66	9.2
	14-Sep-2017	1473	6.87	8.2
	14-Oct-2017	1.616	**6.39** [#1]	7.7
	21-Nov-2017	1674	6.70	1.9
	20-Dec-2017	1830	6.95	-1
RB-MW17-10	21-Nov-2017	1999	6.74	1.3

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
RB-RW-13	15-Mar-2017	1624	6.87	0.8
	11-Apr-2017	1398	**6.32** [#1]	10.1
	15-Jun-2017	1115	6.55	9.6
	19-Aug-2017	1347	6.72	2.3
	14-Sep-2017	1666	6.85	4.8
	14-Oct-2017	1208	6.92	4.4
	21-Nov-2017	1125	6.98	1.6
	20-Dec-2017	2020	7.24	-1
RB-RW-5	15-Mar-2017	2080	6.89	0.4
	11-Apr-2017	1993	**6.08** [#1]	8.6
	16-Jun-2017	2030	6.82	8.6
	19-Aug-2017	1238	6.94	2.8
	14-Sep-2017	2090	7.03	5.4
	14-Oct-2017	278	6.80	3.7
	21-Nov-2017	2190	6.71	5.6
	20-Dec-2017	2240	6.89	-1
RB-RW-8	15-Mar-2017	1685	7.42	1.4
	11-Apr-2017	1006	**6.41** [#1]	7.3
	19-Aug-2017	837	6.60	5.6
	14-Sep-2017	928	7.01	8.7
	14-Oct-2017	914	**6.45** [#1]	5.7
	21-Nov-2017	1057	6.78	2.3
	20-Dec-2017	1378	7.02	0
RB-RW-9	15-Mar-2017	1933	7.30	1.3
	11-Apr-2017	1594	**6.04** [#1]	7.6
	15-Jun-2017	1116	6.87	8.5
	19-Aug-2017	1690	6.77	3.2
	14-Sep-2017	1655	7.13	9.4
	14-Oct-2017	---	6.80	4.6
	22-Nov-2017	1887	6.97	4.0
	20-Dec-2017	2150	7.01	0
Former Reduced Crude Flare Pit				
RCF 03-1-5	21-Aug-2017	1483	6.71	6.9
RCF 98-3-4	21-Aug-2017	1584	6.64	7.9
B-35X Well Site				
B35X-12-1-3	12-Aug-2017	938	6.86	11.5
B35X-12-3-3	12-Aug-2017	1134	6.83	14.0
B35X-12-2-3	12-Aug-2017	1097	6.69	12.0

Advisian
WorleyParsons Group

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
B-38X/FTA Area				
B38 02-17-3	12-Aug-2017	824	6.82	6.5
B38 03-38-5	13-Aug-2017	1011	7.21	9.6
B38-10-2-5	18-Aug-2017	1051	7.07	13.4
B38-10-1-5	18-Aug-2017	1184	7.00	5.5
B38-16-1-3	12-Aug-2017	1304	6.69	13
FTA 98-4-5	16-Aug-2017	2350	7.19	9.9
FTA 99-3-4	16-Aug-2017	5195	6.84	11.7
FTA 99-6-12	16-Aug-2017	5710	7.43	11.1
Mainland Tank Farm				
MTF 97-1-5	17-Aug-2017	877	7.26	9
	14-Sep-2017	1685	7.12	3.6
MTF 98-4-5	17-Aug-2017	1765	7.12	8.2
MTF 98-5-4	17-Aug-2017	1862	6.93	13.9
TF 02-10-5	16-Aug-2017	4180	**6.36** [#1]	14.3
TF 02-7-3	17-Aug-2017	1862	6.93	13.9
TF 02-8-3	16-Aug-2017	3390	6.76	10.2
TF 03-11-4	17-Aug-2017	1550	6.90	9.9
TF 03-12-3	17-Aug-2017	1418	6.87	15.0
	13-Sep-2017	1593	6.91	8.2
B-42X Well Site				
B42-17-1-5	15-Oct-2017	953	6.77	5.4
B42-17-2-4	15-Oct-2017	630	6.82	4.0
B42-17-3-4	15-Oct-2017	667	6.88	4.6
C-36X Well Site				
C36-10-2-3	12-Aug-2017	1343	6.64	6.3
C36-10-1-3	12-Aug-2017	1202	6.59	12.4
C36-10-3-3	12-Aug-2017	1318	6.55	8.1
C-38X Well Site				
C38 08-1-4	12-Aug-2017	1027	**6.26** [#1]	9.5
	12-Sep-2017	1324	6.59	8.2

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
Former Fuel Tanks and Former Campsite Area				
CAB 09-3-3	12-Aug-2017	1013	6.74	16.0
FT-10-1-3	12-Aug-2017	634	7.03	7.8
Background/Control Point Locations - Mainland East				
MEBG-10-1-3	12-Aug-2017	1075	6.82	7.1
	12-Sep-2017	1415	7.03	6.5
MEBG-12-1-3	12-Sep-2017	1415	7.03	6.5
MEBG-12-2-3	20-Aug-2017	820	6.67	8.9
MEBG-15-4-3	12-Aug-2017	606	6.79	12.7
Mainland Sumps - Mainland Drilling Sump Area				
MLS 08-1-4	16-Aug-2017	3750	7.09	12.0
MLS 08-2-5	16-Aug-2017	2350	7.19	9.9
MLS 08-3-4	13-Aug-2017	1690	7.13	18.6
MLS-13-1-3	16-Aug-2017	2040	6.85	12.1
Mainland Sumps - Well Services Sump				
MLS 02-7-7	16-Aug-2017	2430	6.83	7.5
MLS 02-8-8	16-Aug-2017	6960	6.95	8.0
MLS 02-9-8	16-Aug-2017	5520	6.85	6.9
MLS 02-10-8	16-Aug-2017	4200	7.22	7.8
MLS 09-9-2	16-Aug-2017	4180	**6.36** [#1]	14.3
MLS-10-2-3	16-Aug-2017	2840	6.87	10.0
MLS-13-3-3	16-Aug-2017	2010	6.81	8.6
MLS-13-4-3	16-Aug-2017	1173	6.56	10.2
Mainland Sumps - Sumps 1 Through 6				
MLS 02-5-8	16-Aug-2017	6920	7.13	9.2
MLS 09-1-3	16-Aug-2017	5195	6.84	11.7
MLS 09-2-3	16-Aug-2017	3790	6.93	10.6
MLS 09-5-3	16-Aug-2017	3390	6.76	10.2
MLS 09-15-3	16-Aug-2017	5710	7.43	11.1
MLS-10-1-7	16-Aug-2017	4600	7.55	7.3
MLS-13-2-3	16-Aug-2017	1730	7.38	4.3

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
MLS-14-2-3	16-Aug-2017	1129	6.77	13.8
MLS-14-5-4	16-Aug-2017	1000	6.96	9.9
C-27X Sump				
C27 08-1-4	13-Aug-2017	107	6.69	10.2
C27-16-2-3	15-Aug-2017	1636	6.74	8.6
C27-16-4-3	13-Aug-2017	1720	6.64	9.5
Bear Island BT1				
BI BT1 09-1-4	10-Aug-2017	2820	6.63	8.9
BIBT1-15-1-3.5	10-Aug-2017	2220	7.04	9.8
BIBT1-15-2-4	10-Aug-2017	1992	7.15	9.9
BIBT1-15-4-4	11-Aug-2017	1427	6.87	16.5
BIBT1-15-5-3	11-Aug-2017	497	7.03	11.1
BIBT1-15-7-4	11-Aug-2017	816	6.84	10.0
BIBT1-16-1-3	11-Aug-2017	1690	6.81	12.1
BIBT1-16-2-3	11-Aug-2017	1510	6.68	11.2
BIBT1-16-3-3	11-Aug-2017	717	6.89	17.4
BI-14-13-3	11-Aug-2017	885	7.23	14.1
Bear Island West Sumps (Sumps 1-5)				
BI 08-6-4	11-Aug-2017	3360	6.98	13.1
BI 08-8-4	11-Aug-2017	3100	7.40	6.91
BI-13-5-2	10-Aug-2017	572	7.79	21.7
BI-13-6-2	14-Aug-2017	843	6.87	17.5
BIS 97-1-3	22-Nov-2017	1465	7.28	1.9
BIS-10-3-DP	11-Aug-2017	1473	8.08	28.3
BIS-16-1-3	10-Aug-2017	1738	6.72	13.1
BIS-16-7-5	11-Aug-2017	2570	7.16	11.8
BIS-16-8-3	11-Aug-2017	2950	6.68	7.5
BIS-16-10-4	11-Aug-2017	2440	6.95	8.5
BIS-16-11-4	11-Aug-2017	2660	6.93	10.9
BIS-16-12-5	11-Aug-2017	2380	7.18	7.9

Advisian
WorleyParsons Group

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
Bear Island Flare Pit				
BIFP-16-1-3	10-Aug-2017	958	7.64	11.5
BIFP-16-2-3	10-Aug-2017	653	7.48	11.9
BIFP-16-3-3	10-Aug-2017	561	7.34	9.3
BIFP-17-1-3	15-Oct-2017	796	**6.33** [#1]	4.9
Former Bear Island Battery and N-42X Well Site				
BIB 98-2-5	10-Aug-2017	3000	6.83	9.2
BIN42-10-1-5	10-Aug-2017	3410	**6.46** [#1]	13.2
Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites				
BISS2-09-DP-1	14-Aug-2017	706	6.91	15.5
BISS2-09-DP-2	12-Sep-2017	674	6.98	10.0
BISS3-09-DP-1	14-Aug-2017	2350	7.01	14.6
Bear Island East Sump (Sump 6)				
BI 08-2-3	15-Aug-2017	4440	6.75	9.5
BI-13-1-4	15-Aug-2017	1148	6.80	10.9
	22-Nov-2017	1585	7.45	1.0
BI-13-2-4.5	15-Aug-2017	1281	7.06	10.1
BI-13-3-4.5	15-Aug-2017	2150	6.85	13.5
Background/Control Point Locations - Bear Island				
BIBG-10-1-4	11-Aug-2017	1087	**6.42** [#1]	10.7
BIBG-12-2-4	15-Aug-2017	953	6.81	11.9
Goose Island				
GIQ8-10-2-4	20-Aug-2017	817	6.62	5.7
	12-Sep-2017	1060	6.85	4.9
Background/Control Point Locations - Goose Island				
GIBG-10-2-3	20-Aug-2017	890	7.04	7.1
	12-Sep-2017	1267	6.85	6.6

Advisian
WorleyParsons Group

Table 2A

Groundwater Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 2B

Surface Water Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
CCME CEQG Freshwater Aquatic Life [#1]		---	**6.5 - 9.0**	---
Biocells, ARB and B-33X Area				
ARB-17-SW01	12-Aug-2017	841	7.51	18.7
ARB-17-SW02	12-Aug-2017	983	7.55	17.7
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area				
BOS SW01	18-Aug-2017	691	8.33	14.1
C-36X Well Site				
C36 SW01	12-Aug-2017	1145	7.14	20.4
Mainland Sumps - Mainland Drilling Sump Area				
MLS-14-9-SW	16-Aug-2017	392	7.19	14.2
Mainland Sumps - Sumps 1 Through 6				
MLS SW05	21-Aug-2017	642	7.25	10.9
MLS-14-3-SW	16-Aug-2017	196	7.34	14.3
MLS-14-4-SW	16-Aug-2017	307	7.04	14.4
MLS-14-8-SW	21-Aug-2017	305	7.06	8.4
Bear Island West Sumps (Sumps 1-5)				
BI SW01	11-Aug-2017	1245	6.81	21.2
BI SW03	11-Aug-2017	1377	7.65	25.3
BI SW04	11-Aug-2017	1473	8.08	28.3
BI SW05	11-Aug-2017	1348	7.38	28.1
BI SW06	14-Aug-2017	4510	7.34	17.0
BI-13-11	14-Aug-2017	843	6.87	17.5
Bear Island Flare Pit				
BIFP-16-SW1	10-Aug-2017	348	7.91	23.3
BIFP-16-SW2	10-Aug-2017	322	7.91	23
BI SW09	10-Aug-2017	572	7.79	21.7
Former Bear Island Battery and N-42X Well Site				
BIN42-SW01	10-Aug-2017	289	7.66	21.9
Bear Island East Sump (Sump 6)				
BI SW-13-1	14-Aug-2017	415	7.00	16.5
BIWS-16-1-4	15-Aug-2017	3100	6.72	8.1

Advisian
WorleyParsons Group

Table 2B

Surface Water Results: Field Measured Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH units)	Temperature (deg C)
Goose Island				
GI SW05	20-Aug-2017	299	8.39	17.4

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript #1 denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 3B

Surface Water Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions: Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Cations: Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	General: Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Inorganic Nitrogen Compounds: Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols: Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	**120**	---	---	---	**0.3**	---	---	---	---	---	---	---	---	**(6.5 - 9)**	---	---	**3**	---	**0.06**	---	**4**
Biocells, ARB and B-33X Area																								
ARB-17-SW01	12-Aug-2017	350	< 0.50	15	280 [#6]	< 0.50	160	0.11	40	0.080	1.9	11	280	< 0.50	1100	570	---	730	0.56	0.13	< 0.033	< 0.010	0.13	**6.8** [#1]
ARB-17-SW02	12-Aug-2017	420	< 0.50	39	250 [#6]	< 0.50	140	0.081	44	0.25	5.1	43	350	< 0.50	1200	540	---	760	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**5.2** [#1]
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area																								
BOS SW01	18-Aug-2017	230	< 0.50	24	140	< 0.50	79	< 0.060	28	0.0060	0.99	21	190	< 0.50	660	310	---	420	0.077	0.017	< 0.033	< 0.010	0.017	< 2.0
(Duplicate)	18-Aug-2017	230	0.66	24	140	< 0.50	79	< 0.060	28	0.0063	1.1	22	190	0.55	660	310	---	410	0.14	0.031	< 0.033	< 0.010	0.031	< 2.0
C-36X Well Site																								
C36 SW01	12-Aug-2017	570	< 0.50	85	37 [#7]	< 0.50	110	**0.38** [#1]	54	0.63	0.56	67	470	< 0.50	1100	490	---	680	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**18** [#1]
Mainland Sumps - Mainland Drilling Sump Area																								
MLS-14-9-SW	16-Aug-2017	230	< 0.50	1.9	< 0.50	< 0.50	49	**0.48** [#1]	14	0.10	1.2	10	190	< 0.50	350	180	---	240	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**21** [#1]
Mainland Sumps - Sumps 1 Through 6																								
MLS SW05	21-Aug-2017	---	---	73	80	---	---	---	---	---	---	---	---	---	700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
MLS-14-3-SW	16-Aug-2017	110	< 0.50	2.9	2.6	< 0.50	29	0.11	10	0.037	0.46	2.5	90	< 0.50	190	110	---	180	0.044	0.010	< 0.033	< 0.010	< 0.014	**19** [#1]
MLS-14-4-SW	16-Aug-2017	120	< 0.50	2.2	< 0.50	< 0.50	30	0.15	11	0.065	< 0.30	2.9	100	< 0.50	200	120	---	190	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**16** [#1]
(Duplicate)	16-Aug-2017	130	< 0.50	2.2	< 0.50	< 0.50	31	0.24	11	0.067	< 0.30	2.9	100	< 0.50	210	120	---	200	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**17** [#1]
MLS-14-8-SW	21-Aug-2017	190	< 0.50	4.5	9.4	< 0.50	40	**0.45** [#1]	11	0.18	0.59	15	150	< 0.50	320	150	---	260	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**13** [#1]
Bear Island West Sumps (Sumps 1-5)																								
BI SW01	11-Aug-2017	---	---	**210** [#1,6]	1.4	---	---	---	---	---	---	---	---	---	1300	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	11-Aug-2017	---	---	**210** [#1,6]	1.1	---	---	---	---	---	---	---	---	---	1300	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW03	11-Aug-2017	---	---	**230** [#1,6]	130	---	---	---	---	---	---	---	---	---	1400	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW04	11-Aug-2017	---	---	**320** [#1,6]	18	---	---	---	---	---	---	---	---	---	1500	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW05	11-Aug-2017	---	---	**300** [#1,6]	25	---	---	---	---	---	---	---	---	---	1600	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW06	14-Aug-2017	---	---	**660** [#1,6]	910 [#6]	---	---	---	---	---	---	---	---	---	4100	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI-13-11	14-Aug-2017	480	< 0.50	58	10	< 0.50	89	0.11	60	0.45	2.9	28	390	< 0.50	910	470	---	640 [#7]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**49** [#3]

Advisian
WorleyParsons Group

Table 3B

Surface Water Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	3	---	0.06	---	4
Bear Island Flare Pit																								
BIFP-16-SW1	10-Aug-2017	210	< 0.50	4.7	16	< 0.50	54	0.098	14	0.027	1.7	5.9	170	< 0.50	360	190	---	200	0.12	0.027	< 0.033	< 0.010	0.027	**4.6** [#1]
	27-Sep-2017	180	< 0.50	4.5	12	< 0.50	47	0.18	15	< 0.0040	2.0	5.4	150	< 0.50	310	180	---	200	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BIFP-16-SW2	10-Aug-2017	210	< 0.50	4.6	19	< 0.50	54	0.088	14	0.029	1.6	5.9	170	< 0.50	370	200	---	210	0.050	0.011	< 0.033	< 0.010	< 0.014	**4.5** [#1]
	27-Sep-2017	190	< 0.50	4.4	12	< 0.50	46	0.24	15	0.018	1.9	5.3	150	< 0.50	310	170	---	190	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BIFP-17-SW1	27-Sep-2017	190	< 0.50	4.2	12	< 0.50	47	0.24	15	0.0086	2.0	5.3	150	< 0.50	310	180	---	190	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BIFP-17-SW2	27-Sep-2017	190	< 0.50	4.7	12	< 0.50	50	**0.44** [#1]	14	0.086	2.1	5.5	160	< 0.50	330	180	---	180	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
Former Bear Island Battery and N-42X Well Site																								
BIN42-SW01	10-Aug-2017	170	< 0.50	4.5	13	< 0.50	42	< 0.060	13	0.0072	1.5	5.4	140	< 0.50	310	160	---	170	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**6.7** [#1]
Bear Island East Sump (Sump 6)																								
BIS6-17-SW01	27-Sep-2017	280	< 0.50	6.4	36	< 0.50	58	0.082	35	0.054	2.6	8.3	230	< 0.50	490	290	---	310	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW-13-1	14-Aug-2017	290	< 0.50	3.9	16	< 0.50	71	**5.4** [#1]	17	2.0	1.1	5.5	240	< 0.50	490	250	---	310	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**8.3** [#1]
Goose Island																								
GI SW05	20-Aug-2017	70	< 0.50	< 1.0	42	< 0.50	27	< 0.060	7.8	< 0.0040	0.69	1.3	57	< 0.50	200	99	---	130	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	2.4
(Duplicate)	20-Aug-2017	69	< 0.50	< 1.0	42	< 0.50	27	< 0.060	7.8	0.0043	0.67	1.3	56	< 0.50	200	99	---	120	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	< 2.0

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Chloride:
Guideline based on chronic exposure

Nitrate (as N):
Guideline based on long term exposure

Nitrite (as N):
Standard is for NO_2 as N, equivalent standard for NO_2 is 0.197 mg/L.

Table 3B

Surface Water Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	(6.5 - 9)	---	---	3	---	0.06	---	4

Phenols:
Standard is for mono- and dihydric phenols.

7. Superscript [#2] - Method blank exceeds 0.2 mg/L stipulated in Reference Method. No other Quality Control measures affected.
8. Superscript [#3] - Sample analyzed past hold time. Sample analysis is recommended within 48 hours of sampling.
9. Superscript [#4] - Sample was past hold time when received.
10. Superscript [#5] - Detection limit raised based on sample volume used for analysis.
11. Superscript [#6] - Detection limits raised due to dilution to bring analyte within the calibrated range.
12. Superscript [#7] - Detection limits raised due to matrix interference.
13. Superscript [#8] - Detection limits raised due to sample matrix.

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	**120**	---	---	---	**0.3**	---	---	---	---	---	---	---	---	**(6.5 - 9)**	---	---	**3**	---	**0.06**	---	**4**
BOS-DP-13-4-3	18-Aug-2017	520	< 0.50	37 [#7]	59	< 0.50	30	0.11	12	0.13	1.3	180	430	< 0.50	1000	130	---	600	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	< 10 [#1,7]
C30-10-1-5	12-Aug-2017	---	---	**170** [#1]	18	---	320	**22** [#1]	210	0.35	5.4	84	---	---	3000	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**41** [#1]
Background/Control Point Locations - Mainland Central																								
MCBG-10-1-3	12-Aug-2017	850	< 0.50	2.4	33	< 0.50	190	0.094	50	0.13	1.3	29	700	< 0.50	1300	680	---	780	0.47	0.11	< 0.033	< 0.010	0.11	**7.6** [#1]
MCBG-12-1-2	20-Aug-2017	790	< 0.50	5.4	310 [#6]	< 0.50	280	**0.33** [#1]	68	1.0	2.4	13	650	< 0.50	1600	980	---	1300 [#5]	< 0.044	< 0.010	0.11	0.034	0.034	**7.8** [#1]
Former Refinery Area																								
NWR 02-12-7	13-Aug-2017	---	---	25	15	---	---	---	---	---	---	---	---	---	1400	---	---	---	< 0.044	< 0.010	0.046	0.014	< 0.014	---
NWR 09-1-20	13-Aug-2017	---	---	**290** [#1,6]	3.2	---	52	**1.1** [#1]	25	0.20	4.8	710 [#6]	---	---	3100	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
NWR 09-2-26	13-Aug-2017	---	---	**2600** [#1,6]	24	---	44	**2.8** [#1]	34	0.21	9.0	2800	---	---	12000	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
(Duplicate)	13-Aug-2017	---	---	**2300** [#1,6]	< 1.0	---	44	**2.7** [#1]	33	0.21	9.2	2800	---	---	11000	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
NWR 09-3-20	15-Aug-2017	---	---	110	< 1.0	---	48	**2.4** [#1]	16	0.30	3.5	400	---	---	1900	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
NWR 09-4-17	13-Aug-2017	---	---	110	18	---	42	**2.4** [#1]	16	0.29	4.1	450	---	---	2000	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
NWR 09-4-5	11-Apr-2017	590	< 0.50	55	120	< 0.50	100	< 0.060	27	1.4	5.5	150	480	< 0.50	1300	360	7.51	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	16-Jun-2017	430	< 0.50	5.1	82	< 0.50	110	**40** [#1]	25	7.5	1.3	20	360	< 0.50	790	380	---	680 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jul-2017	820	< 0.50	6.9	20	< 0.50	210	**40** [#1]	51	9.8	1.8	20	670	< 0.50	1200	720	---	1000 [#5]	< 0.22	< 0.050 [#8]	< 0.16	< 0.050 [#8]	< 0.071	---
	15-Aug-2017	---	---	15	2.2	---	180	**88** [#1]	46	7.0	2.0	35	---	---	1400	---	---	---	< 0.22	< 0.050 [#8]	< 0.16	< 0.050 [#8]	< 0.071	---
	14-Sep-2017	940	< 0.50	22	< 1.0	< 0.50	200	**68** [#1]	49	7.4	2.2	59	770	< 0.50	1400	710	---	740 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1000	< 0.50	57	0.94	< 0.50	130	**39** [#1]	33	3.6	2.7	150	850	< 0.50	1600	450	---	1000 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1000	< 1.0	72	1.6	< 1.0	140	**28** [#1]	38	3.0	3.8	200	850	< 1.0	1700	500	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
NWR 09-5-19	13-Aug-2017	---	---	**660** [#1,6]	< 1.0	---	25	**2.4** [#1]	11	0.21	4.0	870 [#6]	---	---	4900	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
NWR 98-13-21	15-Aug-2017	---	---	**140** [#1]	5.9	---	94	0.15	39	0.20	4.4	260	---	---	1800	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	**120**	---	---	---	**0.3**	---	---	---	---	---	---	---	---	**(6.5 - 9)**	---	---	**3**	---	**0.06**	---	**4**
RB-OBS-46	11-Apr-2017	920	< 0.50	16	< 2.5 [#8]	< 0.50	170	**0.63** [#1]	86	1.5	1.4	29	750	< 0.50	1400	770	7.34	---	< 0.22	< 0.050 [#8]	< 0.16	< 0.050 [#8]	< 0.050	---
	10-May-2017	1000	< 0.50	12	65 [#8]	< 0.50	160	**120** [#1]	72	1.3	1.6	19	830	< 0.50	1500	700	6.93	1000 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jun-2017	950	< 0.50	12	23	< 0.50	200	**110** [#1]	69	1.1	1.5	32	780	< 0.50	1400	770	---	920 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jul-2017	1100	< 0.50	13	4.4	< 0.50	220	**28** [#1]	95	1.1	2.2	28	860	< 0.50	1500	950	---	1100 [#5]	< 0.22	< 0.050 [#8]	< 0.16	< 0.050 [#8]	< 0.071	---
	19-Aug-2017	960	< 0.50	13	< 0.50	< 0.50	170	**120** [#1]	71	1.1	1.7	21	780	< 0.50	1300	710	---	860 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	15-Sep-2017	1100	< 0.50	12	< 0.50	< 0.50	220	**130** [#1]	69	1.3	2.5	19	910	< 0.50	1500	840	---	720 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1000	< 0.50	15	< 0.50	< 0.50	160	**110** [#1]	64	1.1	2.1	18	820	< 0.50	1400	670	---	920 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	940	< 1.0	14	< 0.50	< 1.0	180	**23** [#1]	99	1.4	2.4	25	770	< 1.0	1300	870	---	900 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-OBS-47	10-May-2017	540	< 0.50	14	510 [#6]	< 0.50	260	**11** [#1]	78	1.6	5.1	35	440	< 0.50	1700	970	7.09	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jul-2017	1200	< 0.50	9.3	32	< 0.50	300	**3.0** [#1]	64	7.5	2.2	21	950	< 0.50	1600	1000	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	15-Jul-2017	1200	< 0.50	8.8	33	< 0.50	300	**11** [#1]	64	7.6	2.1	23	960	< 0.50	1600	1000	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	670	< 0.50	6.5	57	< 0.50	200	**49** [#1]	43	4.2	3.7	20	550	< 0.50	1100	690	---	780 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	15-Sep-2017	1100	< 0.50	8.5	17	< 0.50	300	**61** [#1]	55	5.7	3.0	20	920	< 0.50	1600	980	---	840 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1200	< 0.50	9.7	3.1	< 0.50	240	**64** [#1]	46	4.6	3.0	22	970	< 0.50	1600	800	---	960 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-13-1-2.4	14-Sep-2017	1600	< 0.50	110	89	< 0.50	150	**42** [#1]	53	1.4	3.3	460	1300	< 0.50	2500	600	---	1700 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-13-2-2.4	14-Sep-2017	640	< 0.50	**170** [#1]	140	< 0.50	110	**9.4** [#1]	24	2.8	5.2	260	530	< 0.50	1700	360	---	860 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-13-4-3	14-Sep-2017	1000	< 0.50	**180** [#1]	24	< 0.50	26	**0.56** [#1]	11	0.13	7.0	440	830	< 0.50	2000	110	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-MW17-01	16-Jun-2017	1200	< 0.50	19	20	< 0.50	240	**66** [#1]	51	2.6	2.5	22	960	< 0.50	1700	810	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jul-2017	1400	< 0.50	25	4.1	< 0.50	300	**0.50** [#1]	72	2.4	4.6	65	1100	< 0.50	1900	1000	---	1300 [#5]	0.063	0.014	< 0.033	< 0.010	0.014	---
	19-Aug-2017	1200	< 0.50	18	< 1.0	< 0.50	260	**89** [#1]	51	2.6	3.0	26	950	< 0.50	1600	850	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Sep-2017	1100	< 0.50	16	< 1.0	< 0.50	270	**95** [#1]	52	2.5	2.6	21	920	< 0.50	1500	900	---	880 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1100	< 0.50	16	< 0.50	< 0.50	250	**96** [#1]	49	2.3	2.1	19	880	< 0.50	1500	820	---	740 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1100	< 1.0	18	< 1.0	< 1.0	260	**33** [#1]	55	2.3	2.2	19	890	< 1.0	1500	880	---	900 [#5]	0.27	0.062	< 0.033	< 0.010	0.062	---
RB-MW17-02	16-Jun-2017	1200	< 0.50	32	3.8	< 0.50	250	**11** [#1]	61	2.3	4.9	60	990	< 0.50	1700	870	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jul-2017	1200	< 0.50	31	3.8	< 0.50	270	**1.2** [#1]	69	2.4	5.2	61	990	< 0.50	1700	960	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	1200	< 0.50	26	5.7	< 0.50	240	**20** [#1]	56	2.1	4.1	54	990	< 0.50	1700	840	---	1200 [#5]	0.24	0.053	0.48	**0.15** [#1]	0.20	---
	14-Sep-2017	1200	< 0.50	22	3.9	< 0.50	270	**28** [#1]	61	2.2	4.4	54	950	< 0.50	1600	910	---	1000 [#5]	< 0.044	< 0.010	0.089	0.027	0.027	---
	14-Oct-2017	1000	< 0.50	17	0.77	< 0.50	230	**27** [#1]	53	2.1	4.1	47	850	< 0.50	1500	780	---	800 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1100	< 1.0	25	< 0.50	< 1.0	230	**23** [#1]	54	2.3	4.6	75	900	< 1.0	1500	790	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	(6.5 - 9)	---	---	3	---	0.06	---	4
RB-MW17-03	16-Jun-2017	1100	< 0.50	56	< 1.0	< 0.50	210	**7.9** [#1]	52	1.7	4.2	94	880	< 0.50	1700	740	---	1100 [#5]	0.080	0.018	< 0.033	< 0.010	0.018	---
	16-Jul-2017	1000	< 0.50	32	2.0	< 0.50	240	**0.92** [#1]	59	1.4	3.4	49	840	< 0.50	1500	850	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	1000	< 0.50	28	0.79	< 0.50	220	**24** [#1]	49	1.1	3.0	38	850	< 0.50	1400	750	---	1000 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Sep-2017	980	< 0.50	23	0.77	< 0.50	240	**26** [#1]	54	1.2	3.6	40	800	< 0.50	1400	830	---	1000 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	940	< 0.50	17	< 0.50	< 0.50	210	**29** [#1]	48	0.80	2.8	39	770	< 0.50	1400	710	---	740 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1000	< 1.0	26	< 0.50	< 1.0	220	**29** [#1]	51	1.2	3.1	37	840	< 1.0	1500	770	---	940 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-MW17-04	15-Jun-2017	1200	< 0.50	88	4.7	< 0.50	220	**2.6** [#1]	40	1.2	5.4	170	980	< 0.50	1900	700	---	1300 [#5]	0.10	0.024	< 0.033	< 0.010	0.024	---
	15-Jul-2017	860	< 0.50	63	3.6	< 0.50	180	0.30 [#1]	33	0.97	4.5	130	700	< 0.50	1400	580	---	980 [#5]	0.052	0.012	< 0.033	< 0.010	< 0.014	---
(Duplicate)	15-Jul-2017	850	< 0.50	61	3.1	< 0.50	170	0.28	32	0.94	4.3	130	700	< 0.50	1400	550	---	940 [#5]	0.055	0.012	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	260	< 0.50	14	50	< 0.50	47	0.066	7.4	0.23	1.6	59	210	< 0.50	520	150	---	380 [#5]	0.075	0.017	< 0.033	< 0.010	0.017	---
	14-Sep-2017	820	< 0.50	20	5.8	< 0.50	200	**5.8** [#1]	32	0.50	2.1	63	670	< 0.50	1200	640	---	520 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	14-Sep-2017	820	< 0.50	20	11	< 0.50	200	**5.8** [#1]	31	0.50	2.1	63	670	< 0.50	1200	630	---	580 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	880	< 0.50	19	2.8	< 0.50	210	**8.5** [#1]	39	0.52	2.1	38	720	< 0.50	1300	690	---	800 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	940	< 1.0	23	1.0	< 1.0	210	**8.8** [#1]	38	0.92	2.8	67	770	< 1.0	1400	690	---	940 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-MW17-05	15-Jul-2017	170	< 0.50	6.9	310 [#6]	< 0.50	130	< 0.060	18	0.27	2.5	53	140	< 0.50	880	390	---	650 [#5]	3.1	0.71	0.40	**0.12** [#1]	0.83	---
	19-Aug-2017	200	< 0.50	2.5	80	< 0.50	23	**0.93** [#1]	3.6	0.093	1.3	82	160	< 0.50	460	73	---	320 [#5]	0.85	0.19	0.091	0.028	0.22	---
	14-Sep-2017	600	< 0.50	5.6	83	< 0.50	130	**18** [#1]	26	1.2	2.0	97	490	< 0.50	1000	430	---	520 [#5]	0.18	0.040	0.20	**0.061** [#1]	0.10	---
RB-MW17-06	16-Jun-2017	650	< 0.50	16	84	< 0.50	160	0.16	41	0.90	5.2	24	530	< 0.50	1100	570	---	740 [#5]	0.49	0.11	< 0.033	< 0.010	0.11	---
	15-Jul-2017	840	< 0.50	19	220 [#6]	< 0.50	250	0.19	70	1.8	6.9	35	680	< 0.50	1500	910	---	1200 [#5]	0.32	0.072	0.038	0.011	0.084	---
	19-Aug-2017	750	< 0.50	10	260 [#6]	< 0.50	230	**32** [#1]	49	2.4	3.2	24	620	< 0.50	1400	790	---	1100 [#5]	0.054	0.012	< 0.033	< 0.010	< 0.014	---
	14-Sep-2017	990	< 0.50	7.7	54	< 0.50	280	**78** [#1]	51	1.9	2.3	17	810	< 0.50	1400	900	---	740 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1100	< 0.50	7.7	11	< 0.50	240	**61** [#1]	47	1.7	2.1	24	870	< 0.50	1500	780	---	780 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1100	< 1.0	7.4	0.58	< 1.0	280	**76** [#1]	53	2.2	1.6	13	880	< 1.0	1500	910	---	900 [#5]	0.047	0.011	< 0.033	< 0.010	< 0.014	---
RB-MW17-07	16-Jun-2017	1200	< 0.50	97	1.7	< 0.50	230	**11** [#1]	44	2.3	5.0	140	990	< 0.50	1900	750	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jul-2017	1200	< 0.50	86	2.8	< 0.50	280	**0.76** [#1]	52	2.7	5.3	150	990	< 0.50	1900	900	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	590	< 0.50	38	51	< 0.50	140	0.077	25	1.2	2.7	75	490	< 0.50	1000	460	---	720 [#5]	0.49	0.11	0.041	0.012	0.12	---
	14-Sep-2017	560	< 0.50	36	48	< 0.50	140	0.077	23	1.2	2.5	65	460	< 0.50	980	430	---	820 [#5]	0.53	0.12	< 0.033	< 0.010	0.12	---
	14-Oct-2017	840	< 0.50	44	15	< 0.50	170	**6.3** [#1]	33	1.6	3.3	57	690	< 0.50	1300	570	---	720 [#5]	0.10	0.023	< 0.033	< 0.010	0.023	---
	23-Nov-2017	1100	< 1.0	87	< 2.0 [#7]	< 1.0	220	**19** [#1]	39	1.8	4.0	130	860	< 1.0	1700	700	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---

Advisian
WorleyParsons Group

Table 3A

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	(6.5 - 9)	---	---	3	---	0.06	---	4
RB-MW17-08	16-Jun-2017	1200	< 0.50	77	2.5	< 0.50	220	**9.7** [#1]	48	2.4	5.1	140	1000	< 0.50	1900	760	---	1300 [#5]	0.067	0.015	< 0.033	< 0.010	0.015	---
	15-Jul-2017	1200	< 0.50	76	2.2	< 0.50	260	**1.9** [#1]	57	2.8	5.6	150	1000	< 0.50	1900	890	---	1300 [#5]	0.076	0.017	< 0.033	< 0.010	0.017	---
	19-Aug-2017	1200	< 0.50	56	2.0	< 0.50	230	**23** [#1]	46	2.7	3.7	120	1000	< 0.50	1800	760	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	19-Aug-2017	1300	< 0.50	55	2.1	< 0.50	230	**23** [#1]	46	2.7	3.8	120	1000	< 0.50	1800	760	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Sep-2017	1200	< 0.50	39	< 1.0	< 0.50	260	**26** [#1]	49	2.9	4.2	98	970	< 0.50	1700	850	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1100	< 0.50	44	< 0.50	< 0.50	210	**19** [#1]	46	2.6	4.2	110	910	< 0.50	1700	720	---	940 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1100	< 1.0	62	< 0.50	< 1.0	220	**26** [#1]	47	2.7	4.2	120	900	< 1.0	1600	740	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-MW17-09	16-Jun-2017	1200	< 0.50	46	24	< 0.50	220	**20** [#1]	58	3.3	5.0	110	970	< 0.50	1800	780	---	1300 [#5]	0.14	0.032	< 0.033	< 0.010	0.032	---
(Duplicate)	16-Jun-2017	1200	< 0.50	46	25	< 0.50	220	**20** [#1]	59	3.3	5.0	110	970	< 0.50	1800	790	---	1300 [#5]	0.14	0.032	< 0.033	< 0.010	0.032	---
	15-Jul-2017	1200	< 0.50	47	29	< 0.50	260	**1.7** [#1]	70	4.1	6.5	130	980	< 0.50	1800	930	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	1200	< 0.50	43	19	< 0.50	220	**22** [#1]	53	3.6	4.5	110	1000	< 0.50	1800	770	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Sep-2017	1200	< 0.50	43	14	< 0.50	250	**27** [#1]	57	4.0	4.7	110	970	< 0.50	1700	850	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1200	< 0.50	36	13	< 0.50	140	**17** [#1]	34	2.5	2.9	65	960	< 0.50	1700	500	---	960 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1100	< 1.0	26	0.94	< 1.0	220	**40** [#1]	57	3.3	4.0	63	890	< 1.0	1500	800	---	1000 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-MW17-10	23-Nov-2017	1300	< 1.0	52	3.2	< 1.0	230	**28** [#1]	52	2.4	4.8	170	1100	< 1.0	1900	790	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-RW-13	15-Mar-2017	1100	< 0.50	26	3.5	< 0.50	230	**11** [#1]	48	2.2	4.2	69	880	< 0.50	1600	760	7.40	970	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	11-Apr-2017	1200	< 0.50	50	2.9	< 0.50	170	**6.8** [#1]	32	1.6	4.1	230	970	< 0.50	1700	550	7.55	1100	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	10-May-2017	700	< 0.50	48	13	< 0.50	82	**4.0** [#1]	15	0.90	10	120	570	< 0.50	1200	270	7.54	600 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jun-2017	580	< 0.50	8.6	200	< 0.50	190	**0.32** [#1]	33	0.56	2.5	12	470	< 0.50	1100	620	---	760	2.2	0.51	0.096	0.029	0.53	---
(Duplicate)	15-Jun-2017	560	< 0.50	8.3	200	< 0.50	190	**0.34** [#1]	33	0.56	2.5	12	460	< 0.50	1100	620	---	760	2.2	0.49	0.063	0.019	0.51	---
	16-Jul-2017	840	< 0.50	12	220 [#6]	< 0.50	300	0.096	50	2.2	2.6	16	690	< 0.50	1500	960	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	840	< 0.50	11	150	< 0.50	250	**0.76** [#1]	42	4.1	2.4	15	690	< 0.50	1400	810	---	1000 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	15-Sep-2017	900	< 0.50	15	260 [#6]	< 0.50	340	**0.35** [#1]	54	5.7	2.7	20	740	< 0.50	1700	1100	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	910	< 0.50	20	180	< 0.50	230	**12** [#1]	39	3.6	2.6	30	750	< 0.50	1600	730	---	860 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	730	< 1.0	11	9.5	< 1.0	200	**6.9** [#1]	37	3.3	3.0	25	600	< 1.0	1000	640	---	640 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	(6.5 - 9)	---	---	3	---	0.06	---	4
RB-RW-5	15-Mar-2017	1600	< 0.50	25	15	< 0.50	280	**0.87** [#1]	110	6.6	7.3	71	1300	< 0.50	2300	1200	7.40	1400	0.061	0.014	< 0.033	< 0.010	0.014	---
	11-Apr-2017	1500	< 0.50	25	10	< 0.50	250	**6.5** [#1]	97	5.6	6.2	62	1200	< 0.50	2000	1000	7.53	1300	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	10-May-2017	960	< 0.50	22	120	< 0.50	190	**12** [#1]	63	1.9	9.5	41	790	< 0.50	1600	720	7.40	860 [#5]	0.075	0.017	< 0.033	< 0.010	0.017	---
	16-Jun-2017	1200	< 0.50	20	420 [#6]	< 0.50	260	**0.91** [#1]	140	0.16	4.0	34	950	< 0.50	2100	1200	---	1500	8.5	1.9	0.29	**0.088** [#1]	2.0	---
	15-Jul-2017	1100	< 0.50	21	410 [#6]	< 0.50	290	0.075	160	0.75	3.4	38	900	< 0.50	2000	1400	---	1500	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	1200	< 0.50	23	370 [#6]	< 0.50	260	**46** [#1]	130	1.8	3.7	37	970	< 0.50	2100	1200	---	1600 [#5]	0.071	0.016	< 0.033	< 0.010	0.016	---
	15-Sep-2017	1200	< 0.50	24	330 [#6]	< 0.50	300	**2.8** [#1]	150	2.2	3.2	40	980	< 0.50	2100	1400	---	1500	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	1200	< 0.50	24	330 [#6]	< 0.50	230	**26** [#1]	110	3.6	3.1	38	980	< 0.50	2100	1100	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1200	< 1.0	22	250 [#6]	< 1.0	280	**39** [#1]	130	6.4	4.1	41	980	< 1.0	2000	1200	---	1400 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-RW-8	15-Mar-2017	1000	< 0.50	70	1.1	< 0.50	130	**4.1** [#1]	32	1.2	7.6	190	840	< 0.50	1700	460	7.60	900	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	11-Apr-2017	1000	< 0.50	81	3.3	< 0.50	130	**15** [#1]	30	1.1	6.4	190	850	< 0.50	1700	450	7.51	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
(Duplicate)	11-Apr-2017	1000	< 0.50	82	< 1.0	< 0.50	120	**14** [#1]	27	0.96	5.7	170	830	< 0.50	1700	400	7.50	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	10-May-2017	280	< 0.50	3.4	160	< 0.50	130	**0.34** [#1]	15	0.23	4.3	2.9	230	< 0.50	730	380	7.55	440 [#5]	0.49	0.11	0.11	0.033	0.14	---
(Duplicate)	10-May-2017	280	< 0.50	3.6	160	< 0.50	130	**0.32** [#1]	15	0.23	4.3	2.8	230	< 0.50	730	380	7.57	340 [#5]	0.59	0.13	0.12	0.035	0.17	---
	16-Jul-2017	480	< 0.50	3.4	110	< 0.50	170	**1.0** [#1]	21	2.8	2.6	7.5	400	< 0.50	900	510	---	630	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	500	< 0.50	4.1	47	< 0.50	130	**18** [#1]	22	3.3	2.1	8.3	410	< 0.50	790	430	---	500	0.54	0.12	0.20	**0.061** [#1]	0.18	---
(Duplicate)	19-Aug-2017	510	< 0.50	4.0	42	< 0.50	130	**18** [#1]	22	3.3	2.1	8.3	420	< 0.50	800	430	---	440 [#5]	0.30	0.068	0.13	0.039	0.11	---
	14-Sep-2017	510	< 0.50	2.9	42	< 0.50	150	**20** [#1]	23	2.7	2.4	6.6	420	< 0.50	820	480	---	560 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	14-Oct-2017	670	< 0.50	4.9	13	< 0.50	160	**75** [#1]	30	3.3	2.5	15	550	< 0.50	1000	520	---	640 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	22-Nov-2017	720	< 1.0	4.3	< 1.0	< 1.0	180	**74** [#1]	39	4.9	2.1	11	590	< 1.0	1000	600	---	620 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
RB-RW-9	15-Mar-2017	1300	< 0.50	24	3.1	< 0.50	240	**23** [#1]	98	1.0	4.2	47	1100	< 0.50	1900	1000	7.37	1000	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	11-Apr-2017	1300	< 0.50	24	1.2	< 0.50	230	**43** [#1]	90	0.92	3.9	44	1000	< 0.50	1800	950	7.37	1400 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	10-May-2017	350	< 0.50	4.0	23	< 0.50	83	**5.2** [#1]	21	0.56	5.8	7.6	290	< 0.50	580	290	7.37	320 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.010	---
	15-Jun-2017	540	< 0.50	3.8	230 [#6]	< 0.50	180	0.10	46	0.61	3.5	20	440	< 0.50	1100	630	---	940 [#5]	0.14	0.032	< 0.033	< 0.010	0.032	---
	16-Jul-2017	820	< 0.50	9.0	26	< 0.50	200	**1.2** [#1]	56	1.4	3.6	26	670	< 0.50	1200	740	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	19-Aug-2017	1100	< 0.50	12	2.3	< 0.50	200	**52** [#1]	65	1.4	3.6	35	880	< 0.50	1500	780	---	1000 [#5]	1.5	0.34	0.16	0.048	0.39	---
	14-Sep-2017	1100	< 0.50	14	< 0.50	< 0.50	240	**61** [#1]	80	1.5	4.3	39	900	< 0.50	1600	930	---	940 [#5]	0.15	0.034	< 0.033	< 0.010	0.034	---
	14-Oct-2017	1100	< 0.50	17	< 0.50	< 0.50	210	**62** [#1]	70	1.4	4.1	40	930	< 0.50	1600	810	---	960 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
	23-Nov-2017	1200	< 1.0	18	< 0.50	< 1.0	230	**56** [#1]	83	1.5	4.5	42	950	< 1.0	1600	920	---	1200 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---

Advisian
WorleyParsons Group

Table 3A

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	3	---	0.06	---	4
Former Reduced Crude Flare Pit																								
RCF 03-1-5	21-Aug-2017	---	---	36 [#7]	390 [#6]	---	260	0.27	45	0.62	5.4	36	---	---	1600	---	---	---	0.079	0.018	< 0.033	< 0.010	0.018	---
(Duplicate)	21-Aug-2017	---	---	37 [#7]	390 [#6]	---	260	0.11	45	0.62	5.3	37	---	---	1600	---	---	---	0.079	0.018	< 0.033	< 0.010	0.018	---
RCF 98-3-4	21-Aug-2017	---	---	48	320 [#6]	---	260	**6.1** [#1]	50	0.17	1.2	59	---	---	1700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
B-35X Well Site																								
B35X-12-1-3	12-Aug-2017	---	---	---	---	---	160	< 0.060	32	0.97	1.4	7.6	---	---	---	---	---	---	---	---	---	---	---	---
B35X-12-3-3	12-Aug-2017	---	---	---	---	---	200	**3.7** [#1]	58	0.96	1.4	54	---	---	---	---	---	---	---	---	---	---	---	---
B35X-12-2-3	12-Aug-2017	---	---	---	---	---	180	**1.3** [#1]	43	0.84	1.8	25	---	---	---	---	---	---	---	---	---	---	---	---
B-38X/FTA Area																								
B38 03-38-5	13-Aug-2017	---	---	110	14	---	130	**14** [#1]	64	0.37	3.3	76	---	---	1400	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
B38-10-2-5	18-Aug-2017	---	---	---	---	---	140	**13** [#1]	59	0.12	4.5	48	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	18-Aug-2017	---	---	---	---	---	140	**13** [#1]	60	0.12	4.5	49	---	---	---	---	---	---	---	---	---	---	---	---
B38-10-1-5	18-Aug-2017	---	---	---	---	---	150	**28** [#1]	51	0.47	3.2	52	---	---	---	---	---	---	---	---	---	---	---	---
B38-16-1-3	12-Aug-2017	900	< 0.50	8.0	4.1	< 0.50	180	**19** [#1]	60	2.6	3.1	11	740	< 0.50	1300	700	---	700 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**18** [#1]
FTA 99-3-4	17-Aug-2017	---	---	**150** [#1]	8.7	---	270	**54** [#1]	87	2.4	1.9	44	---	---	2100	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
FTA 99-6-12	13-Aug-2017	---	---	64	4.2	---	---	---	---	---	---	---	---	---	1100	---	---	---	0.052	0.012	< 0.033	< 0.010	< 0.014	---
Mainland Tank Farm																								
MTF 97-1-5	17-Aug-2017	260	< 0.50	1.5	420 [#6]	< 0.50	160	< 0.060	40	< 0.0040	1.0	4.5	210	< 0.50	1100	570	---	920	10	2.3	< 0.033	< 0.010	2.3	**4.1** [#1]
	14-Sep-2017	350	< 0.50	1.0	600 [#6]	< 0.50	270	< 0.060	75	< 0.0040	1.5	3.8	290	< 0.50	1500	980	---	1300	14	**3.3** [#1]	< 0.033	< 0.010	3.3	< 2.0
MTF 98-4-5	17-Aug-2017	---	---	**140** [#1]	< 1.0	---	170	**12** [#1]	77	0.35	3.3	98	---	---	1800	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	17-Aug-2017	---	---	**140** [#1]	< 1.0	---	170	**12** [#1]	78	0.34	3.3	97	---	---	1800	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
MTF 98-5-4	17-Aug-2017	---	---	100	36	---	140	**19** [#1]	63	3.0	1.9	20	---	---	1200	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
TF 02-10-5	17-Aug-2017	---	---	**130** [#1]	62	---	230	**22** [#1]	79	4.0	3.6	70	---	---	1900	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**140** [#1,6]
TF 02-7-3	17-Aug-2017	---	---	110	1.1	---	280	**45** [#1]	59	0.87	1.9	12	---	---	1700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**590** [#1,6]
TF 02-9-3	17-Aug-2017	---	---	---	---	---	120	**25** [#1]	62	1.0	2.9	59	---	---	---	---	---	---	---	---	---	---	---	**30** [#1]

Advisian
WorleyParsons Group

Table 3A

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	3	---	0.06	---	4
TF 03-11-4	17-Aug-2017	---	---	110	3.7	---	97	7.8 [#1]	43	0.12	3.5	160	---	---	1400	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
TF 03-12-3	17-Aug-2017	700	< 0.50	160 [#1]	170	< 0.50	190	1.8 [#1]	77	0.25	5.0	60	570	< 0.50	1700	800	---	1200 [#5]	0.15	0.034	< 0.033	< 0.010	0.034	11 [#1]
	13-Sep-2017	820	< 0.50	190 [#1]	110	< 0.50	190	2.8 [#1]	79	0.31	5.1	54	670	< 0.50	1900	800	---	1100 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	6.6 [#1]
(Duplicate)	13-Sep-2017	690	< 0.50	160 [#1]	150	< 0.50	200	3.7 [#1]	81	0.38	5.0	56	570	< 0.50	1700	820	---	990 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	6.2 [#1]
B-42X Well Site																								
B42-17-1-5	15-Oct-2017	850	< 0.50	27	< 1.0	< 0.50	53	0.53 [#1]	87	0.086	3.6	100	700	< 0.50	1200	490	---	710	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
B42-17-2-4	15-Oct-2017	430	< 0.50	46	6.0	< 0.50	31	0.50 [#1]	20	0.19	2.7	120	350	< 0.50	810	160	---	440 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
B42-17-3-4	15-Oct-2017	360	< 0.50	14	23	< 0.50	44	2.2 [#1]	27	0.27	2.3	62	290	< 0.50	630	220	---	410	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
C-36X Well Site																								
C36 09-1-4	12-Aug-2017	---	---	---	---	---	150	18 [#1]	66	0.52	3.9	56	---	---	---	---	---	---	---	---	---	---	---	---
C36-10-2-3	12-Aug-2017	---	---	33	110	---	250	9.9 [#1]	62	0.39	2.5	45	---	---	1700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	12-Aug-2017	---	---	33	100	---	250	9.7 [#1]	63	0.39	2.5	45	---	---	1700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
C36-10-1-3	12-Aug-2017	---	---	37	< 0.50	---	150	12 [#1]	43	0.38	1.5	45	---	---	1200	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	31 [#1]
C36-10-3-3	12-Aug-2017	---	---	47	< 1.0	---	170	16 [#1]	85	0.27	4.8	94	---	---	1700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	12 [#1]
C-38X Well Site																								
C38 08-1-4	12-Aug-2017	820	< 0.50	19	18	< 0.50	160	27 [#1]	50	1.8	3.3	39	670	< 0.50	1300	590	---	780 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	29 [#1]
	12-Sep-2017	900	< 0.50	14 [#8]	51 [#6]	< 0.50	190	20 [#1]	64	2.0	3.7	53	740	< 0.50	1400	730	---	960 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	22 [#1]
Former Fuel Tanks and Former Campsite Area																								
CAB 09-3-3	12-Aug-2017	---	---	---	---	---	150	2.6 [#1]	38	2.1	1.7	19	---	---	---	---	---	---	---	---	---	---	---	---
FT-10-1-3	12-Aug-2017	---	---	---	---	---	98	< 0.060	20	0.0057	1.2	7.4	---	---	---	---	---	---	---	---	---	---	---	---
Background/Control Point Locations - Mainland East																								
MEBG-10-1-3	12-Aug-2017	770	< 0.50	2.4	180	< 0.50	230	2.8 [#1]	48	0.67	1.5	40	630	< 0.50	1400	760	---	890	0.048	0.011	< 0.033	< 0.010	< 0.014	3.9
	12-Sep-2017	750	< 0.50	2.4	180	< 0.50	220	3.6 [#1]	51	1.2	1.7	33	620	< 0.50	1300	770	---	910	0.41	0.091	< 0.033	< 0.010	0.091	2.6
(Duplicate)	12-Sep-2017	750	< 0.50	2.3	180	< 0.50	220	3.6 [#1]	51	1.2	1.7	33	610	< 0.50	1300	760	---	900	0.38	0.087	< 0.033	< 0.010	0.087	2.3

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	**120**	---	---	---	**0.3**	---	---	---	---	---	---	---	---	**(6.5 - 9)**	---	---	**3**	---	**0.06**	---	**4**
MEBG-12-2-3	20-Aug-2017	570	< 0.50	5.4	73	< 0.50	67	0.20	20	0.85	1.5	130	470	< 0.50	970	250	---	690 [#5]	0.19	0.044	< 0.033	< 0.010	0.044	**7.8** [#1]
MEBG-15-4-3	12-Aug-2017	390	< 0.50	7.7	1.7	< 0.50	89	**2.0** [#1]	20	5.9	1.3	5.8	320	< 0.50	610	310	---	260 [#5]	< 0.044	< 0.010	0.036	0.011	< 0.014	**16** [#1]
Mainland Sumps - Mainland Drilling Sump Area																								
MLS 08-1-4	16-Aug-2017	---	---	**500** [#1,6]	1200 [#6]	---	120	**0.77** [#1]	94	0.48	12	1200 [#6]	---	---	5800	---	---	---	0.14	0.032	0.034	0.010	0.043	---
MLS 08-2-5	16-Aug-2017	---	---	**710** [#1,6]	96	---	---	---	---	---	---	---	---	---	3200	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	16-Aug-2017	---	---	**310** [#1,6]	120	---	---	---	---	---	---	---	---	---	1900	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
MLS 08-3-4	16-Aug-2017	---	---	**870** [#1,6]	40	---	59	< 0.60 [#1]	68	0.60	9.5	1400	---	---	6300	---	---	---	0.099	0.022	0.063	0.019	0.042	---
MLS-13-1-3	16-Aug-2017	920	< 0.50	**170** [#1]	280 [#6]	< 0.50	270	< 0.060	75	0.033	3.0	110	760	< 0.50	2200	970	---	1400	0.65	0.15	< 0.033	< 0.010	0.15	**5.2** [#1]
Mainland Sumps - Well Services Sump Area																								
MLS 02-7-7	16-Aug-2017	---	---	**200** [#1,7]	390 [#6]	---	---	---	---	---	---	---	---	---	2400	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
MLS 02-8-8	16-Aug-2017	---	---	**2400** [#1,6]	1.5	---	---	---	---	---	---	---	---	---	9300	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
(Duplicate)	16-Aug-2017	---	---	**2200** [#1,6]	2.0	---	---	---	---	---	---	---	---	---	9200	---	---	---	0.55	0.12 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
MLS 02-9-8	16-Aug-2017	---	---	**1500** [#1,6]	22	---	---	---	---	---	---	---	---	---	7900	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
MLS 02-10-8	16-Aug-2017	---	---	**670** [#1,6]	< 1.0	---	28	**2.3** [#1]	15	0.11	6.8	1700	---	---	6500	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
MLS 09-9-2	16-Aug-2017	---	---	**1700** [#1,6]	470 [#6]	---	590 [#6]	**0.32** [#1]	230	0.33	5.2	400	---	---	6300	---	---	---	2.9	0.65	0.066	0.020	0.67	---
MLS-10-2-3	16-Aug-2017	---	---	**240** [#1,6]	810 [#6]	---	86	**0.74** [#1]	49	0.46	17	970 [#6]	---	---	4300	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
MLS-13-3-3	16-Aug-2017	690	< 0.50	**370** [#1,6]	48	< 0.50	200	< 0.060	79	0.024	3.2	130	560	< 0.50	2200	820	---	1300	0.079	0.018	< 0.033	< 0.010	0.018	**4.1** [#1]
MLS-13-4-3	16-Aug-2017	900	< 0.50	3.4	11	< 0.50	160	**8.1** [#1]	70	5.6	1.8	40	740	< 0.50	1300	690	---	760	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**4.4** [#1]
Mainland Sumps - Sumps 1 Through 6																								
MLS 02-5-8	16-Aug-2017	---	---	**990** [#1,6]	140	---	---	---	---	---	---	---	---	---	6500	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
MLS 09-1-3	16-Aug-2017	---	---	**1100** [#1,6]	570 [#6]	---	420	**1.6** [#1]	230	0.34	14	320	---	---	4700	---	---	---	0.32	0.073	< 0.033	< 0.010	0.073	---
(Duplicate)	16-Aug-2017	---	---	**1000** [#1,6]	570 [#6]	---	410	**1.4** [#1]	230	0.33	14	320	---	---	4700	---	---	---	0.35	0.078	< 0.033	< 0.010	0.078	---
MLS 09-2-3	16-Aug-2017	---	---	**810** [#1,6]	110	---	220	< 0.060	120	0.0095	5.9	610 [#6]	---	---	4200	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
MLS 09-5-3	16-Aug-2017	---	---	**320** [#1,6]	870 [#6]	---	---	---	---	---	---	---	---	---	3300	---	---	---	0.20	0.044	< 0.033	< 0.010	0.044	---

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	(6.5 - 9)	---	---	3	---	0.06	---	4
MLS 09-15-3	16-Aug-2017	---	---	**1600** [#1,6]	560 [#6]	---	---	---	---	---	---	---	---	---	6600	---	---	---	0.40	0.090	< 0.033	< 0.010	0.090	---
MLS-10-1-7	16-Aug-2017	---	---	**620** [#1,6]	< 1.0	---	---	---	---	---	---	---	---	---	5100	---	---	---	< 0.44	< 0.10 [#7]	< 0.33	< 0.10 [#1,7]	< 0.14	---
(Duplicate)	16-Aug-2017	---	---	**640** [#1,6]	< 1.0	---	---	---	---	---	---	---	---	---	5100	---	---	---	0.96	0.22 [#7]	< 0.33	< 0.10 [#1,7]	0.22	---
MLS-13-2-3	16-Aug-2017	460	< 0.50	**170** [#1]	320 [#6]	< 0.50	55	< 0.060	49	0.031	6.6	310	380	< 0.50	1800	340	---	1200	0.76	0.17	< 0.033	< 0.010	0.17	3.2
MLS-13-9-3	16-Aug-2017	210	< 0.50	1.4	66	< 0.50	50	< 0.060	13	0.0074	0.85	34	170	< 0.50	450	180	---	290	1.9	0.43	< 0.033	< 0.010	0.43	**5.5** [#1]
MLS-14-2-3	16-Aug-2017	950	< 0.50	2.0	27	< 0.50	190	**19** [#1]	62	6.4	4.4	7.3	780	< 0.50	1300	720	---	810	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**35** [#1]
MLS-14-5-4	16-Aug-2017	720	< 0.50	110	59	< 0.50	85	**0.82** [#1]	38	1.4	3.2	110	590	< 0.50	1400	370	---	730	0.046	0.010	< 0.033	< 0.010	< 0.014	3.5
C-27X Sump																								
C27 08-1-4	13-Aug-2017	---	---	---	---	---	180	**7.1** [#1]	51	2.8	4.7	15	---	---	---	---	---	---	---	---	---	---	---	---
C27-16-2-3	15-Aug-2017	1000	< 0.50	3.7	330 [#6]	< 0.50	150	< 0.060	65	0.87	4.6	240	830	< 0.50	2000	650	---	1300	0.20	0.045	< 0.033	< 0.010	0.045	**11** [#1]
(Duplicate)	15-Aug-2017	1000	< 0.50	3.8	330 [#6]	< 0.50	150	< 0.060	64	0.87	4.5	240	830	< 0.50	2000	640	---	1300 [#5]	0.23	0.053	< 0.033	< 0.010	0.053	**10** [#1]
C27-16-4-3	13-Aug-2017	1200	< 0.50	17	280 [#6]	< 0.50	220	0.13	120	1.1	4.9	110	990	< 0.50	2100	1000	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**6.9** [#1]
Bear Island BT1																								
BI BT1 09-1-4	10-Aug-2017	---	---	12	1400 [#6]	---	660 [#6]	**6.0** [#1]	200	8.6	3.8	27	---	---	3400	---	---	---	0.075	0.017	0.062	0.019	0.036	---
BIBT1-15-1-3.5	10-Aug-2017	1500	< 0.50	13	100	< 0.50	380	**28** [#1]	100	0.81	1.8	30	1300	< 0.50	2200	1400	---	1500 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**200** [#1,6]
BIBT1-15-2-4	10-Aug-2017	1400	< 0.50	8.8	310 [#6]	< 0.50	350	**34** [#1]	88	3.6	2.1	130	1200	< 0.50	2300	1200	---	1700 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**46** [#1,7]
BIBT1-15-4-4	11-Aug-2017	510	< 0.50	**140** [#1]	850 [#6]	< 0.50	300	**1.1** [#1]	60	1.7	3.8	23	420	< 0.50	2400	1000	---	2300	1.3	0.29	< 0.033	< 0.010	0.29	**7.0** [#1]
BIBT1-15-5-3	11-Aug-2017	270	< 0.50	8.2	83	< 0.50	83	< 0.060	14	0.14	2.1	29	220	< 0.50	600	270	---	380	1.2	0.27	< 0.033	< 0.010	0.27	< 2.0
BIBT1-15-7-4	11-Aug-2017	480	< 0.50	11	210 [#6]	< 0.50	180	**2.9** [#1]	29	1.3	2.2	14	390	< 0.50	1100	570	---	920	0.43	0.097	< 0.033	< 0.010	0.097	**7.8** [#1]
BIBT1-16-1-3	11-Aug-2017	750	< 0.50	13	260 [#6]	< 0.50	180	**5.3** [#1]	66	1.4	3.1	54	610	< 0.50	1500	720	---	960	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	3.8
BIBT1-16-2-3	11-Aug-2017	660	< 0.50	17	410 [#6]	< 0.50	290	**13** [#1]	65	1.8	3.7	21	540	< 0.50	1600	990	---	1100	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	3.4
BIBT1-16-9	10-Aug-2017	310	< 0.50	5.3	81	< 0.50	59	< 0.060	16	0.33	1.4	68	260	< 0.50	620	210	---	340 [#5]	0.082	0.018	< 0.033	< 0.010	0.018	**6.1** [#1]
	11-Aug-2017	360	< 0.50	9.9	140	< 0.50	130	**4.1** [#1]	20	0.99	3.3	7.9	300	< 0.50	810	410	---	500	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	< 2.0
BI-14-13-3	11-Aug-2017	360	< 0.50	4.6	280 [#6]	< 0.50	170	**0.62** [#1]	41	1.3	6.8	7.6	300	< 0.50	1000	600	---	740	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**6.9** [#1]

Advisian
WorleyParsons Group

Table 3A

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	3	---	0.06	---	4
Bear Island West Sumps (Sumps 1-5)																								
BI 08-6-4	11-Aug-2017	---	---	**330** [#1,6]	400 [#6]	---	550 [#6]	**56** [#1]	180	1.6	3.8	210	---	---	4000	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI 08-8-4	11-Aug-2017	---	---	**770** [#1,6]	15	---	---	---	---	---	---	---	---	---	3300	---	---	---	0.051	0.011	< 0.033	< 0.010	< 0.014	---
(Duplicate)	11-Aug-2017	---	---	**770** [#1,6]	9.9	---	---	---	---	---	---	---	---	---	3300	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI DP 08-5	11-Aug-2017	---	---	**140** [#1]	720 [#6]	---	---	---	---	---	---	---	---	---	2700	---	---	---	0.15	0.033	< 0.033	< 0.010	0.033	---
BIS 97-1-3	22-Nov-2017	1000	< 1.0	20	110	< 1.0	240	**22** [#1]	91	0.86	3.8	19	840	< 1.0	1700	980	---	940 [#5]	0.22	0.050	0.062	0.019	0.068	**14** [#1]
BIS-10-3-DP	11-Aug-2017	940	< 0.50	110	110	< 0.50	200	0.16	140	0.026	2.3	49	770	< 0.50	1800	1100	---	1200 [#5]	0.090	0.020	< 0.033	< 0.010	0.020	---
BIS-16-1-3	10-Aug-2017	1100	< 0.50	100	180	< 0.50	280	**9.4** [#1]	81	2.9	3.9	98	880	< 0.50	2000	1000	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**9.5** [#1]
(Duplicate)	10-Aug-2017	1100	< 0.50	100	190	< 0.50	270	**10** [#1]	82	2.9	4.1	100	890	< 0.50	2000	1000	---	1300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**8.8** [#1]
BIS-16-7-5	11-Aug-2017	820	< 0.50	**620** [#1,6]	< 1.0	< 0.50	310	**43** [#1]	100	1.3	4.0	190	680	< 0.50	3100	1200	---	1900 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**110** [#1,6]
BIS-16-8-3	11-Aug-2017	660	< 0.50	14	1400 [#6]	< 0.50	480	**4.3** [#1]	200	6.4	5.0	230	540	< 0.50	3100	2000	---	2900	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**15** [#1]
BIS-16-10-4	11-Aug-2017	950	< 0.50	**480** [#1,6]	610 [#6]	< 0.50	270	**3.4** [#1]	70	2.6	3.5	350	780	< 0.50	3800	950	---	1900	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**12** [#1]
BIS-16-11-4	11-Aug-2017	760	< 0.50	96	1300 [#6]	< 0.50	620 [#6]	**72** [#1]	150	3.4	2.7	53	620	< 0.50	3200	2100	---	2900 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**20** [#1]
BIS-16-12-5	11-Aug-2017	1000	< 0.50	**520** [#1,6]	< 1.0	< 0.50	330	**29** [#1]	91	2.7	3.4	150	820	< 0.50	3000	1200	---	1800 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**33** [#1]
Bear Island Flare Pit																								
BIFP-16-1-3	10-Aug-2017	480	< 0.50	6.1	200	< 0.50	37	0.12	9.2	0.17	1.6	230	400	< 0.50	1100	130	---	500 [#5]	0.053	0.012	< 0.033	< 0.010	< 0.014	**6.4** [#1]
BIFP-16-2-3	10-Aug-2017	300	< 0.50	5.5	99	< 0.50	55	< 0.060	14	0.27	0.90	78	250	< 0.50	650	200	---	440 [#5]	0.14	0.031	< 0.033	< 0.010	0.031	3.6
BIFP-16-3-3	10-Aug-2017	310	< 0.50	5.3	81	< 0.50	59	< 0.060	16	0.33	1.4	68	260	< 0.50	620	210	---	340 [#5]	0.082	0.018	< 0.033	< 0.010	0.018	**6.1** [#1]
BIFP-17-1-3	15-Oct-2017	670	< 0.50	5.4	30	< 0.50	180	**1.6** [#1]	29	1.1	1.6	7.8	550	< 0.50	1000	570	---	600	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
Former Bear Island Battery and N-42X Well Site																								
BIB 98-2-5	10-Aug-2017	---	---	---	---	---	690 [#6]	**110** [#1]	160	1.2	4.6	29	---	---	---	---	---	---	---	---	---	---	---	---
BIN42-10-1-5	10-Aug-2017	---	---	**290** [#1,6]	1000 [#6]	---	570 [#6]	**39** [#1]	150	1.9	4.8	160	---	---	3600	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**12** [#1]
(Duplicate)	10-Aug-2017	---	---	**290** [#1,6]	1000 [#6]	---	570 [#6]	**39** [#1]	150	1.9	4.8	160	---	---	3600	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**13** [#1]

Advisian
WorleyParsons Group

Table 3A

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	3	---	0.06	---	4
Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites																								
BI O46-09-DP-1	14-Aug-2017	980	< 0.50	9.0	1700 [#6]	< 0.50	630 [#6]	**18** [#1]	250	5.1	2.2	66	810	< 0.50	3600	2600	---	3400 [#5]	0.24	0.054	< 0.033	< 0.010	0.054	**15** [#1]
BISS2-09-DP-1	14-Aug-2017	490	< 0.50	3.9	38	< 0.50	140	**9.0** [#1]	22	0.89	1.6	6.8	400	< 0.50	790	440	---	500	0.85	0.19	< 0.033	< 0.010	0.19	**9.2** [#1]
	12-Sep-2017	550	< 0.50	6.9	48	< 0.50	190	**0.87** [#1]	30	4.0	0.82	5.9	450	< 0.50	890	590	---	610 [#5]	0.58	0.13	< 0.033	< 0.010	0.13	**6.4** [#1]
BISS2-09-DP-2	14-Aug-2017	790	< 0.50	4.3	120	< 0.50	250	**2.2** [#1]	40	4.5	1.0	7.7	650	< 0.50	1300	780	---	870	0.30	0.068	< 0.033	< 0.010	0.068	**13** [#1]
	12-Sep-2017	360	< 0.50	4.8	14	< 0.50	99	**6.9** [#1]	15	0.78	2.0	4.7	290	< 0.50	570	310	---	300 [#5]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**5.9** [#1]
BISS3-09-DP-1	14-Aug-2017	---	---	---	---	---	290	**23** [#1]	200	1.1	1.5	38	---	---	---	---	---	---	---	---	---	---	---	**16** [#1]
BISS3-09-DP-2	14-Aug-2017	---	---	---	---	---	140	0.082	57	0.63	2.6	14	---	---	---	---	---	---	---	---	---	---	---	**8.7** [#1,7]
Bear Island East Sump (Sump 6)																								
BI 08-2-3	15-Aug-2017	---	---	**500** [#1,6]	1100 [#6]	---	610 [#6]	**120** [#1]	190	3.5	3.7	200	---	---	4500	---	---	---	0.36	0.082 [#7]	0.17	0.053 [#7]	0.13	---
BI-13-1-4	15-Aug-2017	650	< 0.50	6.2	220 [#6]	< 0.50	210	**9.1** [#1]	73	2.4	1.6	15	530	< 0.50	1300	820	---	1000	0.070	0.016	< 0.033	< 0.010	0.016	**8.3** [#1]
BI-13-2-4.5	15-Aug-2017	780	< 0.50	16	250 [#6]	< 0.50	240	**43** [#1]	76	0.94	2.0	20	640	< 0.50	1500	910	---	1200	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**20** [#1]
BI-13-3-4.5	15-Aug-2017	500	< 0.50	8.7	850 [#6]	< 0.50	280	**1.0** [#1]	150	0.64	3.6	15	410	< 0.50	2000	1300	---	1700	0.38	0.085	< 0.033	< 0.010	0.085	**9.3** [#1]
	22-Nov-2017	530	< 1.0	6.5	700 [#6]	< 1.0	280	**4.0** [#1]	120	0.49	2.3	13	440	< 1.0	1800	1200	---	1500	0.19	0.043	< 0.033	< 0.010	0.043	3.8
BIWS-16-1-4	15-Aug-2017	640	< 0.50	**180** [#1,7]	980 [#6]	< 0.50	470	**69** [#1]	130	1.7	4.0	28	530	< 0.50	2800	1700	---	2300	< 0.22	< 0.050 [#8]	< 0.16	< 0.050 [#8]	< 0.071	**14** [#1]
Background/Control Points - Bear Island																								
BIBG-10-1-4	11-Aug-2017	540	< 0.50	18	350 [#6]	< 0.50	230	0.072	54	0.14	1.9	7.5	440	< 0.50	1400	800	---	1000	0.82	0.18	< 0.033	< 0.010	0.18	< 2.0
BIBG-12-2-4	15-Aug-2017	720	< 0.50	8.8	89	< 0.50	180	< 0.060	48	0.31	2.7	14	590	< 0.50	1200	660	---	770	0.14	0.031	< 0.033	< 0.010	0.031	**8.0** [#1]
Goose Island																								
GIP9 09-1-4	20-Aug-2017	---	---	24	500 [#6]	---	---	---	---	---	---	---	---	---	2000	---	---	---	0.69	0.16	0.035	0.011	0.17	**6.6** [#1]
GIQ8-10-2-4	20-Aug-2017	450	< 0.50	5.8	91	< 0.50	140	**2.7** [#1]	28	1.5	2.8	8.5	370	< 0.50	820	460	---	560 [#5]	0.089	0.020	< 0.033	< 0.010	0.020	**6.6** [#1]
	12-Sep-2017	390	< 0.50	9.4	220 [#6]	< 0.50	150	**0.31** [#1]	36	1.5	2.3	11	320	< 0.50	990	520	---	740 [#5]	0.090	0.020	< 0.033	< 0.010	0.020	3.8

Table 3A

Groundwater Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	**120**	---	---	---	**0.3**	---	---	---	---	---	---	---	---	---	---	---	**3**	---	**0.06**	---	**4**
Background/Control Points - Goose Island																								
GIBG-10-2-3	20-Aug-2017	370	< 0.50	2.4	140	< 0.50	130	**0.43** [#1]	24	1.7	2.9	30	310	< 0.50	810	430	---	560 [#5]	0.58	0.13	< 0.033	< 0.010	0.13	2.6
(Duplicate)	20-Aug-2017	410	< 0.50	2.3	130	< 0.50	130	**0.44** [#1]	24	1.7	2.9	29	340	< 0.50	840	430	---	560 [#5]	0.50	0.11	< 0.033	< 0.010	0.11	3.8
	12-Sep-2017	630	< 0.50	2.9	180	< 0.50	190	< 0.060	35	0.83	3.7	43	520	< 0.50	1200	630	---	740 [#5]	0.44	0.10	< 0.033	< 0.010	0.10	2.7

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)
   Chloride:
   Guideline based on chronic exposure
   Nitrate (as N):
   Guideline based on long term exposure
   Nitrite (as N):
   Standard is for NO_2 as N, equivalent standard for NO_2 is 0.197 mg/L.
   Phenols:
   Standard is for mono- and dihydric phenols.
7. Superscript [#2] - Method blank exceeds 0.2 mg/L stipulated in Reference Method. No other Quality Control measures affected.
8. Superscript [#3] - Sample analyzed past hold time. Sample analysis is recommended within 48 hours of sampling.
9. Superscript [#4] - Sample was past hold time when received.
10. Superscript [#5] - Detection limit raised based on sample volume used for analysis.
11. Superscript [#6] - Detection limits raised due to dilution to bring analyte within the calibrated range.
12. Superscript [#7] - Detection limits raised due to matrix interference.
13. Superscript [#8] - Detection limits raised due to sample matrix.

Advisian
WorleyParsons Group

Table 3B

Surface Water Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	**120**	---	---	---	**0.3**	---	---	---	---	---	---	---	---	---	---	---	**3**	---	**0.06**	---	**4**
Biocells, ARB and B-33X Area																								
ARB-17-SW01	12-Aug-2017	350	< 0.50	15	280 [#6]	< 0.50	160	0.11	40	0.080	1.9	11	280	< 0.50	1100	570	---	730	0.56	0.13	< 0.033	< 0.010	0.13	**6.8** [#1]
ARB-17-SW02	12-Aug-2017	420	< 0.50	39	250 [#6]	< 0.50	140	0.081	44	0.25	5.1	43	350	< 0.50	1200	540	---	760	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**5.2** [#1]
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area																								
BOS SW01	18-Aug-2017	230	< 0.50	24	140	< 0.50	79	< 0.060	28	0.0060	0.99	21	190	< 0.50	660	310	---	420	0.077	0.017	< 0.033	< 0.010	0.017	< 2.0
(Duplicate)	18-Aug-2017	230	0.66	24	140	< 0.50	79	< 0.060	28	0.0063	1.1	22	190	0.55	660	310	---	410	0.14	0.031	< 0.033	< 0.010	0.031	< 2.0
C-36X Well Site																								
C36 SW01	12-Aug-2017	570	< 0.50	85	37 [#7]	< 0.50	110	**0.38** [#1]	54	0.63	0.56	67	470	< 0.50	1100	490	---	680	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**18** [#1]
Mainland Sumps - Mainland Drilling Sump Area																								
MLS-14-9-SW	16-Aug-2017	230	< 0.50	1.9	< 0.50	< 0.50	49	**0.48** [#1]	14	0.10	1.2	10	190	< 0.50	350	180	---	240	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**21** [#1]
Mainland Sumps - Sumps 1 Through 6																								
MLS SW05	21-Aug-2017	---	---	73	80	---	---	---	---	---	---	---	---	---	700	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
MLS-14-3-SW	16-Aug-2017	110	< 0.50	2.9	2.6	< 0.50	29	0.11	10	0.037	0.46	2.5	90	< 0.50	190	110	---	180	0.044	0.010	< 0.033	< 0.010	< 0.014	**19** [#1]
MLS-14-4-SW	16-Aug-2017	120	< 0.50	2.2	< 0.50	< 0.50	30	0.15	11	0.065	< 0.30	2.9	100	< 0.50	200	120	---	190	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**16** [#1]
(Duplicate)	16-Aug-2017	130	< 0.50	2.2	< 0.50	< 0.50	31	0.24	11	0.067	< 0.30	2.9	100	< 0.50	210	120	---	200	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**17** [#1]
MLS-14-8-SW	21-Aug-2017	190	< 0.50	4.5	9.4	< 0.50	40	**0.45** [#1]	11	0.18	0.59	15	150	< 0.50	320	150	---	260	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**13** [#1]
Bear Island West Sumps (Sumps 1-5)																								
BI SW01	11-Aug-2017	---	---	**210** [#1,6]	1.4	---	---	---	---	---	---	---	---	---	1300	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
(Duplicate)	11-Aug-2017	---	---	**210** [#1,6]	1.1	---	---	---	---	---	---	---	---	---	1300	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW03	11-Aug-2017	---	---	**230** [#1,6]	130	---	---	---	---	---	---	---	---	---	1400	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW04	11-Aug-2017	---	---	**320** [#1,6]	18	---	---	---	---	---	---	---	---	---	1500	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW05	11-Aug-2017	---	---	**300** [#1,6]	25	---	---	---	---	---	---	---	---	---	1600	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW06	14-Aug-2017	---	---	**660** [#1,6]	910 [#6]	---	---	---	---	---	---	---	---	---	4100	---	---	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI-13-11	14-Aug-2017	480	< 0.50	58	10	< 0.50	89	0.11	60	0.45	2.9	28	390	< 0.50	910	470	---	640 [#7]	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**49** [#3]

Advisian
WorleyParsons Group

Table 3B

Surface Water Analytical Results: Indicator Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	3	---	0.06	---	4
Bear Island Flare Pit																								
BIFP-16-SW1	10-Aug-2017	210	< 0.50	4.7	16	< 0.50	54	0.098	14	0.027	1.7	5.9	170	< 0.50	360	190	---	200	0.12	0.027	< 0.033	< 0.010	0.027	**4.6** [#1]
	27-Sep-2017	180	< 0.50	4.5	12	< 0.50	47	0.18	15	< 0.0040	2.0	5.4	150	< 0.50	310	180	---	200	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BIFP-16-SW2	10-Aug-2017	210	< 0.50	4.6	19	< 0.50	54	0.088	14	0.029	1.6	5.9	170	< 0.50	370	200	---	210	0.050	0.011	< 0.033	< 0.010	< 0.014	**4.5** [#1]
	27-Sep-2017	190	< 0.50	4.4	12	< 0.50	46	0.24	15	0.018	1.9	5.3	150	< 0.50	310	170	---	190	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BIFP-17-SW1	27-Sep-2017	190	< 0.50	4.2	12	< 0.50	47	0.24	15	0.0086	2.0	5.3	150	< 0.50	310	180	---	190	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BIFP-17-SW2	27-Sep-2017	190	< 0.50	4.7	12	< 0.50	50	**0.44** [#1]	14	0.086	2.1	5.5	160	< 0.50	330	180	---	180	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
Former Bear Island Battery and N-42X Well Site																								
BIN42-SW01	10-Aug-2017	170	< 0.50	4.5	13	< 0.50	42	< 0.060	13	0.0072	1.5	5.4	140	< 0.50	310	160	---	170	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**6.7** [#1]
Bear Island East Sump (Sump 6)																								
BIS6-17-SW01	27-Sep-2017	280	< 0.50	6.4	36	< 0.50	58	0.082	35	0.054	2.6	8.3	230	< 0.50	490	290	---	310	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	---
BI SW-13-1	14-Aug-2017	290	< 0.50	3.9	16	< 0.50	71	**5.4** [#1]	17	2.0	1.1	5.5	240	< 0.50	490	250	---	310	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	**8.3** [#1]
Goose Island																								
GI SW05	20-Aug-2017	70	< 0.50	< 1.0	42	< 0.50	27	< 0.060	7.8	< 0.0040	0.69	1.3	57	< 0.50	200	99	---	130	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	2.4
(Duplicate)	20-Aug-2017	69	< 0.50	< 1.0	42	< 0.50	27	< 0.060	7.8	0.0043	0.67	1.3	56	< 0.50	200	99	---	120	< 0.044	< 0.010	< 0.033	< 0.010	< 0.014	< 2.0

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Chloride:
Guideline based on chronic exposure

Nitrate (as N):
Guideline based on long term exposure

Nitrite (as N):
Standard is for NO_2 as N, equivalent standard for NO_2 is 0.197 mg/L.

PROJECT No.: 407011-00622-300

		Anions					Cations						General						Inorganic Nitrogen Compounds					Phenols
Sampling Location	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Phenols (µg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	---	120	---	---	---	0.3	---	---	---	---	---	---	---	---	(6.5 - 9)	---	---	3	---	0.06	---	4

Phenols:
Standard is for mono- and dihydric phenols.

7. Superscript [#2] - Method blank exceeds 0.2 mg/L stipulated in Reference Method. No other Quality Control measures affected.
8. Superscript [#3] - Sample analyzed past hold time. Sample analysis is recommended within 48 hours of sampling.
9. Superscript [#4] - Sample was past hold time when received.
10. Superscript [#5] - Detection limit raised based on sample volume used for analysis.
11. Superscript [#6] - Detection limits raised due to dilution to bring analyte within the calibrated range.
12. Superscript [#7] - Detection limits raised due to matrix interference.
13. Superscript [#8] - Detection limits raised due to sample matrix.

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**
Central Processing Facility (CPF)							
CPF 97-7-5	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
CPF 98-8-3	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Background/Control Point Locations - Mainland West							
MWBG-10-1-3	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Biocells, ARB and B-33X Area							
ARB-10-2-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-12-4-2	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-12-3-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-12-1-4	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-13-1-4.5	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-13-3-4.5	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-13-5-4.5	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-16-1-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-17-1-3	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-17-2-3	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-17-3-5	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.11	< 0.10
BC2-15-1-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BC2-15-2-4	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BC2-15-3-4	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BC2-15-4-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
Biocell Sumps							
BC1-NORTH	22-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BC1-SOUTH	22-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BC2-NORTH	22-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BC2-SOUTH	22-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
F-31X Well Site							
F31 98-1-4	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080 [#4]	< 0.49	---
B-30X Well Site							
B30-13-1-5.4	13-Aug-2017	< 0.00040	< 0.00040	< 0.00040	0.0014	< 0.10	< 0.10
B30-13-2-4.5	13-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B30-13-3-4.5	13-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B30-13-4-3.9	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B30-17-1-5	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B30X-12-2-4	13-Aug-2017	**2.2** [#1,3]	**0.027** [#1]	0.014	0.95	2.8	1.6
B30X-12-1-4	13-Aug-2017	**1.6** [#1,3]	**0.0099** [#1]	0.0042	0.62	4.7	13
(Duplicate)	13-Aug-2017	**1.7** [#1,3]	**0.0097** [#1]	0.0034	0.62	4.4	13
Well Services/Warehouse Yard							
WSY 97-1-5	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area							
BOS-DP-13-2-1.35	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BOS-DP-13-3-2	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BOS-DP-13-4-3	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	1.6
C30-10-1-5	12-Aug-2017	0.091	< 0.00040	0.0044	0.030	0.14	4.3

Advisian
WorleyParsons Group

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
Background/Control Point Locations - Mainland Central							
MCBG-10-1-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MCBG-12-1-2	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Former Refinery Area							
NWR 09-1-20	13-Aug-2017	0.0076	< 0.00040	< 0.00040	< 0.00080	0.34	1.2
NWR 09-2-26	13-Aug-2017	**0.56** [#1]	**0.0077** [#1]	0.00091	0.22	2.8	2.5
(Duplicate)	13-Aug-2017	0.35	**0.0045** [#1]	0.0012	0.12	1.3	2.4
NWR 09-4-5	15-Mar-2017	0.013	< 0.00040	0.0012	0.0038	0.47	---
	11-Apr-2017	0.012	< 0.00040	0.00051	0.0095	0.74	61
	16-Jun-2017	0.021	< 0.00040	< 0.00040	0.0032	0.51	3.4
	15-Jul-2017	0.33	0.00071	0.00095	0.034	0.55	3.5
	15-Aug-2017	**0.54** [#1]	0.0015	0.0029	0.063	0.70	1.2
	14-Sep-2017	**0.43** [#1]	0.0020 [#1]	0.0021	0.059	0.94	6.5
	14-Oct-2017	0.26	0.0017	0.0017	0.046	0.80	4.7
	23-Nov-2017	0.15	**0.015** [#1]	0.0017	0.056	1.0	3.4
	20-Dec-2017	0.14	**0.0040** [#1]	0.0031	0.080	3.0	5.4
NWR 98-13-21	15-Aug-2017	0.024	< 0.00040	< 0.00040	< 0.00080	0.23	0.18
RB-OBS-46	15-Mar-2017	**0.83** [#1]	0.0020 [#1,4]	0.0068	0.25	38	5200 [#3]
	11-Apr-2017	**1.3** [#1,3]	0.0010	0.0047	0.19	13	1900 [#3]
	10-May-2017	**0.78** [#1]	0.0011	0.0021	0.13	1.7	140
	15-Jun-2017	0.20	0.0011	0.0019	0.051	3.1	40
	15-Jul-2017	0.28	0.00085	0.0018	0.072	1.5	35
	19-Aug-2017	**0.94** [#1]	0.00069 [#4]	0.0032	0.12	6.2	50
	15-Sep-2017	**0.53** [#1]	0.00079	0.0039	0.12	1.6	18
	14-Oct-2017	**0.79** [#1]	0.00071	0.0043	0.14	1.9	33
	23-Nov-2017	**0.62** [#1]	0.00052 [#7]	0.0037	0.12	11	46
	20-Dec-2017	**0.67** [#1]	0.00054	0.0022	0.083	6.5	220

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
RB-OBS-47	11-Apr-2017	0.21	**0.0035** [#1]	0.0078	0.038	8.4	---
	10-May-2017	0.072	0.00041	0.00072	0.0066	0.62	2.6
	15-Jul-2017	0.014	0.00060	0.00093	0.0024 [#4]	0.48	5.5
(Duplicate)	15-Jul-2017	0.014	0.00069	0.00097	0.0029 [#4]	0.59	4.9
	19-Aug-2017	0.013	0.00048	0.00075	0.0024 [#4]	0.39	7.5
	15-Sep-2017	0.018	0.00065 [#4]	0.00061	0.0023	0.25	2.7
	14-Oct-2017	0.040	0.00057	0.0019	0.0053 [#4]	0.92	6.6
	23-Nov-2017	0.11	0.00054 [#7]	0.0027	0.0085 [#7]	0.53	9.9
	20-Dec-2017	0.18	0.00043	0.0030	0.011	0.78	6.4
RB-13-1-2.4	14-Sep-2017	**0.65** [#1]	0.00042	< 0.00040	0.017	< 0.10	0.18
RB-13-2-2.4	14-Sep-2017	0.0082	< 0.00040	0.0032	0.0033	< 0.10	0.19
RB-13-4-3	14-Sep-2017	0.047	< 0.00040	0.00059	< 0.00080	0.10	0.35
RB-MW17-01	16-Jun-2017	**0.47** [#1]	0.0011	0.012	0.35	0.72	2.2
	15-Jul-2017	**0.73** [#1]	**0.0022** [#1]	0.0063	0.44	0.25	2.8
	19-Aug-2017	**0.54** [#1]	0.0011	0.0098	0.32	1.1	2.7
	14-Sep-2017	**0.41** [#1]	0.00089	0.0093	0.27	1.5	27
	14-Oct-2017	**0.39** [#1]	0.00089	0.0083	0.27	2.4	17
	23-Nov-2017	**0.40** [#1]	0.0011	0.0066	0.26	0.75	25
	20-Dec-2017	**0.59** [#1]	0.00067	0.0089	0.25	2.9	21 [#8]
RB-MW17-02	16-Jun-2017	**0.84** [#1]	**0.0039** [#1]	0.040	0.53	0.88	2.5
	15-Jul-2017	**0.70** [#1]	**0.0031** [#1]	0.010	0.40	0.90	2.8
	19-Aug-2017	**1.2** [#1,3]	**0.0042** [#1]	0.037	0.67	2.0	59
	14-Sep-2017	**1.2** [#1,3]	**0.0042** [#1]	0.055	0.70	8.7	17
	14-Oct-2017	**0.66** [#1]	**0.0031** [#1]	0.021	0.54	3.0	8.9
	23-Nov-2017	**0.63** [#1]	**0.0028** [#1]	0.022	0.48	1.5	3.5
	20-Dec-2017	**0.63** [#1]	**0.0037** [#1]	0.023	0.51	3.7	12

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
RB-MW17-03	16-Jun-2017	**1.9** [#1,3]	**0.22** [#1]	0.065	0.69	1.9	12
	16-Jul-2017	**3.6** [#1,3]	**0.68** [#1]	**0.11** [#1]	1.1	0.65	3.6
	19-Aug-2017	**4.0** [#1,3]	**1.0** [#1,3]	**0.16** [#1]	1.4	1.3	5.3
	14-Sep-2017	**3.7** [#1,3]	**0.61** [#1]	**0.13** [#1]	1.2	5.4	40
	14-Oct-2017	**3.4** [#1,3]	**0.91** [#1]	**0.14** [#1]	1.1	1.2	30
	23-Nov-2017	**4.2** [#1,3]	**0.75** [#1]	**0.16** [#1]	1.4	< 0.10	57
	20-Dec-2017	**1.9** [#1,3]	**0.16** [#1]	**0.10** [#1]	1.0	2.4	12
RB-MW17-04	15-Jun-2017	**1.9** [#1,3]	**2.2** [#1,3]	**0.24** [#1]	1.1	2.7	50
	15-Jul-2017	**1.4** [#1,3]	**1.6** [#1,3]	**0.25** [#1]	1.1	1.3	7.3
(Duplicate)	15-Jul-2017	**1.4** [#1,3]	**1.6** [#1,3]	**0.25** [#1]	1.1	1.1	60 [#9]
	19-Aug-2017	0.27	**0.32** [#1]	0.034	0.35	3.1	23
	14-Sep-2017	**4.3** [#1,3]	**2.5** [#1,3]	**0.16** [#1]	0.77	< 0.10	6.8
(Duplicate)	14-Sep-2017	**2.9** [#1,3]	**1.7** [#1,3]	**0.21** [#1]	0.92	2.2	15
	14-Oct-2017	**4.6** [#1,3]	**2.3** [#1,3]	**0.24** [#1]	1.1	4.2	27
(Duplicate)	14-Oct-2017	**4.9** [#1,3]	**2.4** [#1,3]	**0.23** [#1]	1.1	3.6	32
	23-Nov-2017	**3.8** [#1,3]	**2.2** [#1,3]	**0.28** [#1]	1.2	< 0.10	130
RB-MW17-05	15-Jun-2017	**2.4** [#1,3]	**1.3** [#1,3]	**0.13** [#1]	0.57	0.37	1.9 [#10]
	15-Jul-2017	0.084	**0.037** [#1]	0.0056	0.022	0.30	0.37
	19-Aug-2017	0.0021	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.42
	14-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.16
RB-MW17-06	16-Jun-2017	**0.79** [#1]	**0.42** [#1]	**0.11** [#1]	0.45	0.90	0.99
	15-Jul-2017	**0.80** [#1]	**0.31** [#1]	**0.092** [#1]	0.35	0.35	1.2
	19-Aug-2017	**0.40** [#1]	**0.11** [#1]	**0.11** [#1]	0.39	0.87	2.5
	14-Sep-2017	0.16	**0.013** [#1]	**0.13** [#1]	0.47	1.6	2.2
	14-Oct-2017	0.28	**0.069** [#1]	**0.11** [#1]	0.41	3.5	6.2
	23-Nov-2017	0.22	**0.012** [#1]	**0.16** [#1]	0.52	1.1	11
	20-Dec-2017	**0.83** [#1]	**0.22** [#1]	**0.15** [#1]	0.46	1.7	2.5
(Duplicate)	20-Dec-2017	**0.83** [#1]	**0.21** [#1]	**0.15** [#1]	0.45	1.7	1.9

Advisian
WorleyParsons Group

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**
RB-MW17-07	16-Jun-2017	**0.41** [#1]	**0.16** [#1]	0.089	0.36	0.55	2.1
	15-Jul-2017	0.31	**0.061** [#1]	0.070	0.30	0.71	1.5
	19-Aug-2017	0.11	**0.012** [#1]	0.0066	0.095	0.27	0.86
	14-Sep-2017	0.012	**0.0030** [#1]	0.00043	0.0038	0.29	0.98
	14-Oct-2017	**0.93** [#1]	**0.40** [#1]	0.058	0.21	1.8	1.8
	23-Nov-2017	**0.54** [#1]	**0.16** [#1]	0.050	0.22	0.82	15
	20-Dec-2017	**0.38** [#1]	**0.074** [#1]	0.054	0.25	1.4	2.5
RB-MW17-08	16-Jun-2017	0.042	< 0.00040	0.00055	0.022	0.40	4.1
	15-Jul-2017	0.045	0.00044	0.00043	0.021	0.47	1.8
	19-Aug-2017	0.054	0.00041 [#4]	0.00058	0.013	6.2	15
(Duplicate)	19-Aug-2017	0.066	< 0.00040	0.00057	0.017	1.6	13
	14-Sep-2017	0.048	< 0.00040	0.00060	0.019	0.72	6.7
	14-Oct-2017	0.068	0.0011	0.00068	0.021	0.69	11
	23-Nov-2017	0.10	< 0.00040	0.00057	0.023	0.71	21
	20-Dec-2017	0.12	< 0.00040	0.00058	0.022	0.88	1.9
RB-MW17-09	16-Jun-2017	0.23	0.00045	0.0017	0.093	0.49	1.9
(Duplicate)	16-Jun-2017	0.22	0.00047	0.0016	0.085	0.57	1.8
	15-Jul-2017	0.20	0.00050	0.00052	0.078	0.79	1.8
	19-Aug-2017	0.22	< 0.00040	0.00095	0.036	0.78	4.5
	14-Sep-2017	0.22	< 0.00040	0.0011	0.026	0.59	2.0
	14-Oct-2017	0.16	0.00079	0.00065	0.019	1.5	7.8
	23-Nov-2017	0.25	0.00043	0.0019	0.071	0.75	2.3
(Duplicate)	23-Nov-2017	0.26	0.00047	0.0018	0.068	0.67	6.3
	20-Dec-2017	0.29	< 0.00040	0.0021	0.085	0.93	2.5
RB-MW17-10	19-Jun-2017	**0.69** [#1]	0.0015	0.013	0.14	0.40	7.1
	23-Nov-2017	**0.38** [#1]	< 0.00040	0.0052	0.060	0.90	9.5
RB-MW17-11	19-Jun-2017	**0.86** [#1]	**0.0038** [#1,4]	0.0040	0.42	10	90

Advisian
WorleyParsons Group

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**
RB-RW-13	15-Mar-2017	0.013	**0.12** [#1]	0.0013	0.0035	0.50	9.0
	11-Apr-2017	0.013	**0.020** [#1]	0.00073	0.0017	0.12	3.5
	10-May-2017	0.0084	**0.0026** [#1]	0.0010	0.0018	0.12	1.6
	15-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.67
(Duplicate)	15-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.25
	16-Jul-2017	0.00095	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.71
	19-Aug-2017	0.0030	< 0.00040	< 0.00040	< 0.00080	0.21	1.6
	15-Sep-2017	0.0076	< 0.00040	< 0.00040	< 0.00080	0.24	0.74
	14-Oct-2017	0.026	0.00073	0.00065	0.0043	0.26	0.61
(Duplicate)	14-Oct-2017	0.022	0.00064	0.00058	0.0039	0.33	0.76
	23-Nov-2017	0.016	< 0.00040	< 0.00040	0.0024	0.25	0.97
(Duplicate)	23-Nov-2017	0.017	< 0.00040	< 0.00040	0.0028	0.37	2.5
	21-Dec-2017	0.0091	**0.0024** [#1]	0.0011	0.0020	0.21	1.2
RB-RW-5	15-Mar-2017	0.0011	**0.073** [#1]	< 0.00040	< 0.00080	< 0.10	27
	11-Apr-2017	0.0036	**0.016** [#1]	0.00061	0.0065	0.28	33
	10-May-2017	0.0020	**0.17** [#1]	0.00046	< 0.00080	0.35	33
	16-Jun-2017	< 0.00040	**0.011** [#1]	< 0.00040	< 0.00080	< 0.10	3.2
	15-Jul-2017	< 0.00040	**0.0025** [#1]	< 0.00040	< 0.00080	< 0.10	6.9
	19-Aug-2017	< 0.00040	**0.0045** [#1]	< 0.00040	< 0.00080	< 0.10	22
	15-Sep-2017	< 0.00040	**0.010** [#1]	< 0.00040	< 0.00080	< 0.10	4.1
	14-Oct-2017	0.0018	**0.015** [#1]	< 0.00040	< 0.00080	< 0.10	5.6
	23-Nov-2017	0.0041	**0.0087** [#1]	< 0.00040	< 0.00080	< 0.10	15
	20-Dec-2017	0.0032	**0.0062** [#1]	< 0.00040	< 0.00089	0.14	2.4

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
RB-RW-8	15-Mar-2017	0.0027	< 0.00040	< 0.00040	< 0.00080	0.44	0.30
(Duplicate)	15-Mar-2017	0.0024	< 0.00040	< 0.00040	< 0.00080	0.35	0.76
	11-Apr-2017	0.0025	0.00067	< 0.00040	< 0.00080 [#4]	0.16	8.2
(Duplicate)	11-Apr-2017	0.0024	0.00056	< 0.00040	< 0.00080	0.11	4.9
	10-May-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.35	2.1
(Duplicate)	10-May-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.41	1.9
	16-Jul-2017	0.0050	< 0.00040	< 0.00040	< 0.00080	0.19	0.46
	19-Aug-2017	0.078	0.00047	0.00051	0.011	0.13	0.93
(Duplicate)	19-Aug-2017	0.085	0.00051	0.00057	0.012	0.26	1.3
	14-Sep-2017	0.12	0.00051	0.00058	0.016	0.25	1.8
	14-Oct-2017	0.18	0.00051	0.00066	0.012	0.21	41
	22-Nov-2017	0.24	0.00061	0.0012	0.026	0.27	0.73
	20-Dec-2017	0.23	0.00078	0.0013	0.022	0.54	1.5
RB-RW-9	15-Mar-2017	0.017	**0.021** [#1]	< 0.00040	0.0040	0.84	16
	11-Apr-2017	0.010	**0.0049** [#1]	0.00043 [#4]	0.0031 [#4]	0.91	6.8
	10-May-2017	0.0035	< 0.00040	< 0.00040	< 0.00080	0.32	3.4
	15-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.36
	16-Jul-2017	0.023	0.00073	< 0.00040	0.0012	0.43	3.1
	19-Aug-2017	0.064	0.00070	0.00052	0.0026 [#4]	0.40	6.5
	14-Sep-2017	0.069	0.0014	< 0.00040	0.0022 [#4]	0.50	8.5
	14-Oct-2017	0.073	0.0014	0.00055	0.0024 [#4]	1.1	12
	23-Nov-2017	0.22	0.00097	0.00055	0.013 [#7]	0.85	8.1
	20-Dec-2017	0.15	0.0019	0.00067	0.0070	1.1	7.1
(Duplicate)	20-Dec-2017	0.15	**0.0021** [#1]	0.00061	0.0068	1.0	8.9
B-38X/FTA Area							
B38 03-38-5	13-Aug-2017	**9.9** [#1,3]	0.00045	0.0019	0.011 [#4]	< 0.10	0.64
B38-10-2-5	18-Aug-2017	0.084	< 0.00040	< 0.00040	0.055	0.24	1.5
(Duplicate)	18-Aug-2017	0.078	< 0.00040	< 0.00040	0.051	0.17	1.4
B38-16-1-3	12-Aug-2017	0.054	< 0.00040	< 0.00040	0.0030	0.20	3.1
FTA 98-4-5	13-Aug-2017	**14** [#1,3]	**8.5** [#1,3]	**0.22** [#1]	6.9 [#3]	< 0.10	11
(Duplicate)	13-Aug-2017	**14** [#1,3]	**8.2** [#1,3]	**0.22** [#1]	6.3 [#3]	< 0.10	13
FTA 99-3-4	17-Aug-2017	**0.38** [#1]	**0.088** [#1]	0.026	0.069	3.4	6.8

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
FTA 99-6-12	13-Aug-2017	**3.0** [#1,3]	**0.0035** [#1]	0.081	1.5	2.5	31
Mainland Tank Farm							
MTF 97-1-5	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	14-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MTF 98-4-5	17-Aug-2017	0.0072	< 0.00040	< 0.00040	< 0.00080	< 0.10	1.1
(Duplicate)	17-Aug-2017	0.0068	< 0.00040	< 0.00040	< 0.00080	< 0.10	1.0
MTF 98-5-4	17-Aug-2017	0.13	< 0.00040	0.00071	< 0.00080	0.73	4.6
TF 02-10-5	17-Aug-2017	0.0085	0.00087 [#4]	0.0079	0.010 [#4]	3.8	47
TF 02-7-3	17-Aug-2017	**6.5** [#1,3]	**2.2** [#1,3]	0.077	3.3 [#3]	6.0	24
TF 02-8-3	17-Aug-2017	**1.0** [#1,3]	**0.011** [#1]	0.012	0.058	4.3	19
TF 02-9-3	17-Aug-2017	**4.0** [#1,3]	**3.4** [#1,3]	**0.29** [#1]	1.9	2.2	23
TF 03-11-4	17-Aug-2017	**6.8** [#1,3]	0.00059	**0.30** [#1]	0.81	2.3	0.37
TF 03-12-3	17-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	13-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	13-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B-42X Well Site Area							
B42-17-1-5	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B42-17-2-4	15-Oct-2017	0.0014	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
B42-17-3-4	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
C-36X Well Site							
C36 09-1-4	12-Aug-2017	0.022	< 0.00040	0.0019	< 0.00080	0.16	5.8
C36-10-1-3	12-Aug-2017	**0.83** [#1]	**0.0057** [#1]	0.027	0.24	0.45	2.3
C-38X Well Site							
C38 08-1-4	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10

Advisian
WorleyParsons Group

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	---	---	---
Background/Control Point Locations - Mainland East							
MEBG-10-1-3	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MEBG-12-2-3	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MEBG-15-4-3	12-Aug-2017	0.00058	< 0.00040	< 0.00040	0.00097	0.82	0.60
Mainland Sumps - Well Services Sump Area							
MLS 02-8-8	16-Aug-2017	0.069	0.0016	< 0.00040	0.0027	0.23	0.34
(Duplicate)	16-Aug-2017	0.064	0.0015	< 0.00040	0.0024	0.13	0.34
MLS-13-3-3	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MLS-13-4-3	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Mainland Sumps - Sumps 1 Through 6							
MLS-13-2-3	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MLS-13-9-3	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MLS-14-2-3	16-Aug-2017	< 0.00040	**0.024** [#1]	< 0.00040	< 0.00080	< 0.10	0.19
MLS-14-5-4	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
C-27X Sump							
C27-16-2-3	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
C27-16-4-3	13-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.16
Bear Island BT1							
BI BT1 09-1-4	10-Aug-2017	0.0023	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIBT1-15-1-3.5	10-Aug-2017	**12** [#1,3]	**0.0070** [#1]	0.063	0.051	< 0.10	< 0.10
BIBT1-15-2-4	10-Aug-2017	**11** [#1,3]	**0.24** [#1]	**0.36** [#1]	1.1	< 0.10	0.24
BIBT1-15-4-4	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIBT1-15-5-3	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIBT1-15-7-4	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10

Advisian
WorleyParsons Group

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**
BIBT1-16-1-3	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIBT1-16-2-3	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIBT1-16-3-3	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BI-14-13-3	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Bear Island West Sumps (Sumps 1-5)							
BI 08-8-4	11-Aug-2017	0.052	0.00050	0.0015	0.0075	< 0.10	0.46
(Duplicate)	11-Aug-2017	0.051	0.00048	0.0015	0.0074	< 0.10	0.49
BIS 97-1-3	22-Nov-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIS-16-1-3	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIS-16-7-5	11-Aug-2017	**5.6** [#1,3]	**1.5** [#1,3]	**0.34** [#1]	1.4	2.4	0.39
BIS-16-8-3	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIS-16-10-4	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIS-16-11-4	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIS-16-12-5	11-Aug-2017	**3.2** [#1,3]	**0.0093** [#1]	**0.35** [#1]	0.39	1.9	0.52
Bear Island Flare Pit							
BIFP-16-1-3	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIFP-16-2-3	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIFP-16-3-3	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIFP-17-1-3	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites							
BI O46-09-DP-1	14-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BISS2-09-DP-1	14-Aug-2017	< 0.00040	0.0012	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BISS2-09-DP-2	14-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**
Bear Island East Sump (Sump 6)							
BI-13-1-4	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BI-13-2-4.5	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BI-13-3-4.5	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	22-Nov-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIWS-16-1-4	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Background/Control Point Locations - Bear Island							
BIBG-10-1-4	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIBG-12-2-4	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Goose Island							
GIP9 09-1-4	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
GIQ8-10-2-4	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Background/Control Point Locations - Goose Island							
GIBG-10-2-3	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	12-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10

Advisian
WorleyParsons Group

Table 4A

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)
7. Superscript [#2] - Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.
8. Superscript [#3] - Detection limits raised due to dilution to bring analyte within the calibrated range.
9. Superscript [#4] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
10. Superscript [#5] - Matrix Spike below acceptance limits due to matrix interference. Reanalysis yields similar results.
11. Superscript [#6] - Detection limits raised due to insufficient sample volume for reanalysis. Unable to reanalyze due to insufficient sample.
12. Superscript [#7] - Tentatively identified result and may be potentially biased high due to matrix interference.
13. Superscript [#8] - Duplicate exceeds acceptance criteria due to sample matrix. Reanalysis yields similar results.
14. Superscript [#9] - Duplicate exceeds acceptance criteria due to difference in sample container. Reanalysis yields similar results.
15. Superscript [#10] - Detection limit raised based on sample volume used for analysis.

Advisian
WorleyParsons Group

Table 4B

Surface Water Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**
Biocells, ARB and B-33X Area							
ARB-17-SW01	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
ARB-17-SW02	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area							
BOS SW01	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
C-36X Well Site							
C36 SW01	12-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Mainland Sumps - Mainland Drilling Sump Area							
MLS-14-9-SW	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Mainland Sumps - Sumps 1 Through 6							
MLS-14-3-SW	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MLS-14-4-SW	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
MLS-14-8-SW	21-Aug-2017	< 0.00040	0.00070	< 0.00040	< 0.00080	< 0.10	< 0.10
Bear Island West Sumps (Sumps 1-5)							
BI-13-11	14-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Bear Island Flare Pit							
BIFP-16-SW1	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIFP-16-SW2	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIFP-17-SW1	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BIFP-17-SW2	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
BI SW09	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Former Bear Island Battery and N-42X Well Site							
BIN42-SW01	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Bear Island East Sump (Sump 6)							
BI SW-13-1	14-Aug-2017	< 0.00040	0.0014	< 0.00040	< 0.00080	< 0.10	< 0.10
BIS6-17-SW01	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
Goose Island							
GI SW05	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10
(Duplicate)	20-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10

Advisian
WorleyParsons Group

Table 4B

Surface Water Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
Central Processing Facility (CPF)																	
CPF 09-3-5	17-Aug-2017	0.0064	0.00053	0.21	0.000072	< 0.0010	0.0016	0.19	< 0.00020	---	0.0011	0.0097	0.00031	< 0.00010	< 0.00020	**0.016** [#1]	0.014
CPF 09-6-19	17-Aug-2017	0.0032	0.00078	0.85	< 0.000020	< 0.0010	0.00030	**0.46** [#1]	< 0.00020	---	0.0032	< 0.00050	**0.0024** [#1]	< 0.00010	< 0.00020	0.00029	< 0.0030
CPF 97-2-7	17-Aug-2017	< 0.0030	**0.018** [#1]	1.1	< 0.000020	< 0.0010	0.00030	**2.4** [#1]	< 0.00020	---	0.00044	0.0020	**0.0012** [#1]	< 0.00010 [#2]	< 0.00020	0.00095	0.0057
CPF 97-7-5	17-Aug-2017	0.032	0.00042	0.055	0.000033	< 0.0010	0.00076	**1.8** [#1]	< 0.00020	< 0.0000020	0.0058	0.0090	0.00056	< 0.00010	< 0.00020	0.0035	0.014
(Duplicate)	17-Aug-2017	0.025	0.00039	0.051	0.000043	< 0.0010	0.00094	**1.8** [#1]	< 0.00020	0.0000021	0.0061	0.0087	0.00062	< 0.00010	< 0.00020	0.0035	0.012
	12-Sep-2017	0.034	0.00060	0.038	0.000023	< 0.0010	0.0014	**5.2** [#1]	< 0.00020	< 0.0000020	0.0075	0.011	0.00028	< 0.00010	< 0.00020	0.0047	0.011
CPF 98-3-5	17-Aug-2017	0.0062	0.0011	0.21	< 0.000020	< 0.0010	< 0.00020	**2.0** [#1]	< 0.00020	---	< 0.00020	0.0045	0.00067	< 0.00010	< 0.00020	0.012	< 0.0030
(Duplicate)	17-Aug-2017	0.0063	0.0017	0.22	< 0.000020	< 0.0010	< 0.00020	**2.1** [#1]	< 0.00020	---	< 0.00020	0.0047	0.00086	< 0.00010	< 0.00020	0.013	< 0.0030
CPF 98-6-3	17-Aug-2017	0.0061	0.00095	0.36	**0.00012** [#1]	< 0.0010	0.0012	**4.7** [#1]	< 0.00020	---	0.031	0.019	**0.0030** [#1]	< 0.00010	0.00039	**0.040** [#1]	0.014
CPF 98-8-3	17-Aug-2017	0.045	0.00032	0.030	0.000084	< 0.0010	0.0025	0.081	0.00021	< 0.0000020	0.0012	0.0023	0.00024	< 0.00010	< 0.00020	0.00042	0.012
	12-Sep-2017	0.049	0.00063	0.021	0.000032	< 0.0010	0.0016	**0.76** [#1]	< 0.00020	< 0.0000020	0.00081	0.0032	0.00022	< 0.00010	< 0.00020	0.00059	0.015
Background/Control Point Locations - Mainland West																	
MWBG-10-1-3	17-Aug-2017	0.0047	0.00038	0.18	**0.00023** [#1]	< 0.0010	**0.0048** [#1]	0.072	< 0.00020	---	0.0013	0.011	0.00031	< 0.00010	< 0.00020	0.0070	0.013
Former Battery #3 and Battery #3 Flare Pit																	
BT3 97-11-11	13-Aug-2017	0.0034	**0.0077** [#1]	**1.7** [#1]	< 0.000020	< 0.0010	0.00031	**0.78** [#1]	< 0.00020	---	< 0.00020	0.00084	0.00028	< 0.00010	< 0.00020	0.00045	< 0.0030
BT3 99-20-13	13-Aug-2017	0.0071	0.00079	0.85	< 0.000020	< 0.0010	0.0024	0.085	< 0.00020	---	< 0.00020	0.013	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
BT3 99-21-12	13-Aug-2017	0.072	0.0033	0.41	< 0.000020	< 0.0010	0.0013	**1.5** [#1]	0.00026	---	0.0037	0.0067	0.00022	< 0.00010	< 0.00020	0.0048	0.0043
BT3 99-23-13	13-Aug-2017	0.0032	0.00062	**1.7** [#1]	< 0.000020	< 0.0010	0.00040	**0.96** [#1]	< 0.00020	---	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	13-Aug-2017	0.0036	0.00069	**1.7** [#1]	< 0.000020	< 0.0010	0.00045	**0.98** [#1]	< 0.00020	---	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
Biocells, ARB and B-33X Area																	
ARB-10-2-3	12-Aug-2017	0.0086	0.00056	0.023	0.000032	< 0.0010	0.0022	0.11	< 0.00020	---	0.0066	0.0042	0.00040	< 0.00010	< 0.00020	0.0034	0.0046
ARB-12-4-2	12-Aug-2017	0.0094	0.00070	< 0.020	0.000065	< 0.0010	0.0018	< 0.060	< 0.00020	---	0.012	0.0056	**0.0036** [#1]	< 0.00010	< 0.00020	0.0042	0.0073
ARB-12-3-3	12-Aug-2017	0.015	0.00076	0.049	0.000077	< 0.0010	**0.0063** [#1]	< 0.060	< 0.00020	< 0.0000020	0.0015	0.0057	0.00058	< 0.00010	< 0.00020	0.011	0.011
	12-Sep-2017	0.013	0.00077	0.039	0.000070	< 0.0010	0.0040 [#1]	< 0.060	< 0.00020	< 0.0000020	0.0031	0.0033	**0.0030** [#1]	< 0.00010	< 0.00020	0.0081	0.0047
ARB-12-1-4	12-Aug-2017	0.0092	0.00057	< 0.020	0.000038	< 0.0010	0.0031	< 0.060	< 0.00020	---	0.011	0.0063	**0.0013** [#1]	< 0.00010	< 0.00020	0.0037	0.0058

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
ARB-13-1-4.5	12-Aug-2017	0.0062	**0.016** [#1]	0.30	0.000048	< 0.0010	0.0014	**6.4** [#1]	< 0.00020	---	0.0020	0.0099	0.00035	< 0.00010	< 0.00020	0.0077	0.020
ARB-13-3-4.5	12-Aug-2017	0.0037	**0.022** [#1]	0.71	< 0.000020	< 0.0010	0.00031	**4.5** [#1]	< 0.00020	---	0.00085	0.0013	0.00067	< 0.00010	< 0.00020	0.00015	0.0053
ARB-13-5-4.5	12-Aug-2017	0.015	**0.023** [#1]	0.38	< 0.000020	0.0014	0.00028	**4.6** [#1]	< 0.00020	---	0.0098	0.010	0.00071	< 0.00010	< 0.00020	**0.020** [#1]	0.0088
(Duplicate)	12-Aug-2017	0.015	**0.023** [#1]	0.38	< 0.000020	0.0013	0.00080	**4.6** [#1]	< 0.00020	---	0.0096	0.010	0.00067	< 0.00010	< 0.00020	**0.020** [#1]	0.010
ARB-16-1-3	12-Aug-2017	0.0076	0.00040	0.021	**0.00021** [#1]	< 0.0010	0.0031	< 0.060	< 0.00020	---	0.0027	0.0057	0.00072	< 0.00010	< 0.00020	0.0083	< 0.0030
BC2-15-1-3	12-Aug-2017	0.024	0.00066	0.020	**0.00014** [#1]	< 0.0010	**0.0050** [#1]	< 0.060	< 0.00020	---	0.0030	0.0054	0.00071	< 0.00010	< 0.00020	0.0047	0.0084
BC2-15-2-4	12-Aug-2017	0.0054	0.00032	0.047	0.000057	< 0.0010	**0.0044** [#1]	0.10	< 0.00020	---	0.0021	0.019	0.00030	< 0.00010	< 0.00020	0.0079	0.012
BC2-15-3-4	12-Aug-2017	0.041	0.0015	0.094	0.000021	0.0010	0.0018	**1.1** [#1]	0.00030	---	0.0016	0.014	0.00036	< 0.00010	< 0.00020	0.0043	0.0082
BC2-15-4-3	12-Aug-2017	0.014	0.00093	< 0.020	0.000036	< 0.0010	0.0013	0.083	< 0.00020	---	0.011	0.0062	**0.0062** [#1]	< 0.00010	< 0.00020	0.0085	0.0069
G-32X Well Site																	
G32-10-1-3	17-Aug-2017	0.011	0.00041	0.064	**0.00020** [#1]	< 0.0010	**0.0057** [#1]	< 0.060	< 0.00020	---	0.00028	0.0066	0.00061	< 0.00010	< 0.00020	0.0073	0.022
B-30X Well Site																	
B30-13-1-5.4	13-Aug-2017	0.0043	0.0016	0.13	< 0.000020	< 0.0010	0.00089	**0.40** [#1]	< 0.00020	---	0.011	0.0075	0.00054	< 0.00010	< 0.00020	**0.018** [#1]	< 0.0030
B30-13-2-4.5	13-Aug-2017	0.0055	0.00042	0.15	**0.00029** [#1]	< 0.0010	**0.0054** [#1]	< 0.060	< 0.00020	---	0.0023	0.0082	0.00076	< 0.00010	< 0.00020	**0.021** [#1]	0.0091
B30-13-3-4.5	13-Aug-2017	0.0067	0.0011	0.49	**0.00023** [#1]	< 0.0010	**0.0071** [#1]	0.19	0.00025	---	0.0011	0.011	**0.0015** [#1]	< 0.00010	< 0.00020	**0.033** [#1]	0.0040
B30-13-4-3.9	18-Aug-2017	< 0.0030	0.00028	0.32	0.000032	< 0.0010	0.0037	< 0.060	< 0.00020	---	0.062	0.0023	**0.019** [#1]	< 0.00010	< 0.00020	0.0070	0.0034
B30X-12-2-4	13-Aug-2017	0.026	**0.025** [#1]	0.068	< 0.000020	0.0021	< 0.00020	**71** [#1]	< 0.00020	---	0.0071	0.0066	**0.0020** [#1]	< 0.00010	< 0.00020	0.00097	0.0038
B30X-12-1-4	13-Aug-2017	**0.16** [#1]	**0.027** [#1]	0.16	0.000029	0.0048	0.0012	**36** [#1]	0.0011	---	0.0037	0.046	**0.0062** [#1]	< 0.00010	< 0.00020	**0.019** [#1]	0.0094
(Duplicate)	13-Aug-2017	**0.19** [#1]	**0.028** [#1]	0.17	0.000044	0.0049	0.00057	**37** [#1]	0.0012	---	0.0037	0.048	**0.0062** [#1]	< 0.00010	< 0.00020	**0.020** [#1]	0.013
Well Services/Warehouse Yard																	
WSY 97-1-5	18-Aug-2017	0.0086	0.00049	0.11	0.000069	< 0.0010	0.0020	0.22	< 0.00020	< 0.0000020	0.012	0.0033	**0.0033** [#1]	< 0.00010	< 0.00020	0.0065	0.019
	12-Sep-2017	0.016	0.0016	0.20	< 0.000020	< 0.0010	0.0019	**2.3** [#1]	< 0.00020	0.0000025	0.0086	0.0039	**0.0014** [#1]	< 0.00010	< 0.00020	0.0039	0.0057
WSY 97-2-4	13-Aug-2017	0.0054	**0.0059** [#1]	0.21	< 0.000020	< 0.0010	< 0.00020	**2.3** [#1]	< 0.00020	---	0.00027	0.0043	0.00083	< 0.00010	< 0.00020	0.0028	< 0.0030

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area																	
BOS-DP-13-2-1.35	18-Aug-2017	0.030	**0.013** [#1]	0.059	< 0.000020	< 0.0010	0.00031	**20** [#1]	< 0.00020	---	0.0011	0.0019	0.00023	< 0.00010	< 0.00020	0.00012	0.0094
BOS-DP-13-4-3	18-Aug-2017	0.0067	**0.0081** [#1]	0.33	< 0.000020	< 0.0010	< 0.00020	0.11	< 0.00020	---	0.0082	0.00097	0.00022	< 0.00010	< 0.00020	0.00028	< 0.0030
C30-10-1-5	12-Aug-2017	0.016	**0.0095** [#1]	0.26	< 0.000020	< 0.0010	0.00049	**22** [#1]	< 0.00020	---	0.0011	0.0043	**0.0016** [#1]	< 0.00010	< 0.00020	0.0075	0.0075
Background/Control Point Locations - Mainland Central																	
MCBG-10-1-3	12-Aug-2017	0.016	0.00060	0.084	**0.00015** [#1]	< 0.0010	**0.0083** [#1]	0.094	< 0.00020	---	0.0016	0.013	0.00041	< 0.00010	< 0.00020	0.011	0.0070
MCBG-12-1-2	20-Aug-2017	0.021	0.0013	0.24	**0.00031** [#1]	< 0.0010	**0.0059** [#1]	**0.33** [#1]	< 0.00020	---	0.00099	0.015	0.00047	< 0.00010	< 0.00020	**0.031** [#1]	0.013
Former Refinery Area																	
NWR 09-1-20	13-Aug-2017	0.0078	0.0039	0.75	< 0.000020	< 0.0010	0.00055	**1.1** [#1]	< 0.00020	---	< 0.00020	0.00069	0.00026	< 0.00010	< 0.00020	< 0.00010	0.0080
NWR 09-2-26	13-Aug-2017	0.0077	0.0040	1.2	< 0.000020	< 0.0010	0.0013	**2.8** [#1]	< 0.00020	---	0.00079	0.00070	0.00045	< 0.00010	< 0.00020	0.00070	0.0075
(Duplicate)	13-Aug-2017	0.0056	0.0039	1.2	< 0.000020	0.0016	0.0012	**2.7** [#1]	< 0.00020	---	0.00085	0.0010	0.00061	< 0.00010	< 0.00020	0.00069	0.0040
NWR 09-3-20	15-Aug-2017	0.0040	0.0050 [#1]	0.84	< 0.000020	< 0.0010	0.0013	**2.4** [#1]	< 0.00020	---	0.00088	0.0013	0.00029	< 0.00010	< 0.00020	0.00027	0.0053
NWR 09-4-17	13-Aug-2017	< 0.0030	**0.020** [#1]	0.95	0.000031	< 0.0010	0.00030	**2.4** [#1]	0.00049	---	0.00061	0.0088	0.00030	< 0.00010	< 0.00020	0.00078	0.0047
NWR 09-4-5	11-Apr-2017	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	16-Jun-2017	---	---	---	---	---	---	**40** [#1]	---	---	---	---	---	---	---	---	---
	15-Jul-2017	---	---	---	---	---	---	**40** [#1]	---	---	---	---	---	---	---	---	---
	15-Aug-2017	0.072	**0.12** [#1]	0.067	< 0.000020	0.0015	0.00048	**88** [#1]	0.0022	---	0.00067	0.0061	0.0010 [#1]	< 0.00010	< 0.00020	0.00019	0.0091
	14-Sep-2017	---	---	---	---	---	---	**68** [#1]	---	---	---	---	---	---	---	---	---
	14-Oct-2017	---	---	---	---	---	---	**39** [#1]	---	---	---	---	---	---	---	---	---
	23-Nov-2017	---	---	---	---	---	---	**28** [#1]	---	---	---	---	---	---	---	---	---
NWR 09-5-19	13-Aug-2017	0.0036	**0.061** [#1]	1.1	< 0.000020	< 0.0010	0.00051	**2.4** [#1]	< 0.00020	---	< 0.00020	0.0013	0.00031	< 0.00010	< 0.00020	0.00024	0.0060
NWR 98-13-21	15-Aug-2017	0.0051	0.0013	0.50	< 0.000020	< 0.0010	0.00057	0.15	< 0.00020	---	< 0.00020	0.00052	**0.0072** [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
Former Reduced Crude Flare Pit																	
RCF 03-1-5	21-Aug-2017	0.026	0.00089	0.096	**0.00011** [#1]	< 0.0010	0.0012	0.27	< 0.00020	---	0.00033	0.0080	0.00027	< 0.00010	< 0.00020	0.0094	0.011
(Duplicate)	21-Aug-2017	0.0044	0.00057	0.094	0.000081	< 0.0010	0.0014	0.11	< 0.00020	---	0.00029	0.0081	0.00022	< 0.00010	< 0.00020	0.0089	0.011
RCF 98-3-4	21-Aug-2017	0.0048	0.0033	0.043	0.000024	< 0.0010	0.0013	**6.1** [#1]	< 0.00020	---	0.00045	0.0044	0.00036	< 0.00010	< 0.00020	0.0088	0.0069

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B-35X Well Site																	
B35X-12-1-3	12-Aug-2017	0.0077	0.00077	< 0.020	**0.00016 [#1]**	< 0.0010	0.0023	< 0.060	< 0.00020	---	0.017	0.011	0.00064	< 0.00010	< 0.00020	0.011	0.0098
B35X-12-3-3	12-Aug-2017	< 0.0030	0.0021	0.032	< 0.000020	< 0.0010	0.00089	**3.7 [#1]**	< 0.00020	---	0.0066	0.0093	0.00023	< 0.00010	< 0.00020	**0.018 [#1]**	0.0061
B35X-12-2-3	12-Aug-2017	0.0041	0.00081	0.023	**0.000098 [#1]**	< 0.0010	0.0021	**1.3 [#1]**	< 0.00020	---	0.0048	0.0086	0.00024	< 0.00010	< 0.00020	0.0093	0.0055
B-38X/FTA Area																	
B38 03-38-5	13-Aug-2017	0.015	**0.014 [#1]**	0.11	< 0.000020	< 0.0010	0.00021	**14 [#1]**	< 0.00020	---	0.0043	0.0026	0.00045	< 0.00010	< 0.00020	0.00093	0.019
B38-10-2-5	18-Aug-2017	0.0079	**0.015 [#1]**	0.090	< 0.000020	0.0012	0.00085	**13 [#1]**	< 0.00020	---	0.00037	0.0023	0.00081	< 0.00010	< 0.00020	< 0.00010	0.0093
(Duplicate)	18-Aug-2017	0.0076	**0.015 [#1]**	0.088	< 0.000020	0.0012	< 0.00020	**13 [#1]**	< 0.00020	---	0.00040	0.0023	0.00095	< 0.00010	< 0.00020	< 0.00010	0.0075
B38-10-1-5	18-Aug-2017	0.010	**0.068 [#1]**	0.074	< 0.000020	0.0012	0.0013	**28 [#1]**	< 0.00020	---	0.0023	0.010	0.00096	< 0.00010	< 0.00020	0.00097	0.0093
B38-16-1-3	12-Aug-2017	0.011	**0.0080 [#1]**	0.061	0.000039	< 0.0010	0.0018	**19 [#1]**	0.00025	---	0.0026	0.013	0.00049	< 0.00010	< 0.00020	0.0018	0.012
FTA 99-3-4	17-Aug-2017	0.030	**0.014 [#1]**	0.045	< 0.000020	< 0.0010	0.00074	**54 [#1]**	0.00036	---	0.00035	0.0053	**0.0020 [#1]**	< 0.00010	< 0.00020	0.0023	0.0077
Mainland Tank Farm																	
MTF 97-1-5	17-Aug-2017	0.0030	0.00026	< 0.020	**0.00013 [#1]**	< 0.0010	0.0028	< 0.060	< 0.00020	0.0000042	0.043	0.0072	**0.078 [#1]**	< 0.00010	< 0.00020	**0.023 [#1]**	0.0049
	14-Sep-2017	0.019	0.00021	0.030	**0.00017 [#1]**	< 0.0010	0.0023	< 0.060	< 0.00020	< 0.0000020	0.018	0.0065	**0.15 [#1]**	< 0.00010	< 0.00020	**0.029 [#1]**	0.0094
MTF 98-4-5	17-Aug-2017	< 0.0030	0.0013	0.16	< 0.000020	< 0.0010	< 0.00020	**12 [#1]**	< 0.00020	---	0.00038	0.00082	0.00034	< 0.00010	< 0.00020	< 0.00010	0.0056
(Duplicate)	17-Aug-2017	< 0.0030	0.0013	0.16	< 0.000020	< 0.0010	0.00047	**12 [#1]**	< 0.00020	---	0.00036	0.00096	0.00043	< 0.00010	< 0.00020	< 0.00010	0.0063
MTF 98-5-4	17-Aug-2017	0.076	**0.011 [#1]**	0.029	< 0.000020	< 0.0010	0.00046	**19 [#1]**	0.00029	---	0.0086	0.0052	0.00046	< 0.00010	< 0.00020	0.0047	0.0061
TF 02-10-5	17-Aug-2017	0.0040	**0.010 [#1]**	0.083	0.000028	< 0.0010	0.00069	**22 [#1]**	**0.010 [#1]**	---	0.00098	0.021	**0.0023 [#1]**	< 0.00010	< 0.00020	0.0096	0.0060
TF 02-7-3	17-Aug-2017	0.0067	**0.018 [#1]**	0.057	< 0.000020	< 0.0010	0.00053	**45 [#1]**	**0.019 [#1]**	---	0.0030	0.024	**0.0072 [#1]**	< 0.00010	< 0.00020	0.010	0.0091
TF 02-9-3	17-Aug-2017	0.058	**0.014 [#1]**	0.14	< 0.000020	< 0.0010	0.00037	**25 [#1]**	0.00054	---	0.0040	0.0021	**0.0013 [#1]**	< 0.00010	< 0.00020	0.0010	0.0067
TF 03-11-4	17-Aug-2017	0.011	**0.0067 [#1]**	0.19	< 0.000020	< 0.0010	0.00039	**7.8 [#1]**	< 0.00020	---	0.0019	0.00062	0.00039	< 0.00010	< 0.00020	0.00051	0.0039
TF 03-12-3	17-Aug-2017	0.011	0.0039	0.044	**0.00011 [#1]**	< 0.0010	0.00085	**1.8 [#1]**	0.00024	0.0000029	**0.23 [#1]**	0.023	**0.0044 [#1]**	< 0.00010	**0.0016 [#1]**	**0.020 [#1]**	0.0074
	13-Sep-2017	0.014	**0.0058 [#1]**	0.042	**0.000098 [#1]**	< 0.0010	0.00082	**2.8 [#1]**	< 0.00020	< 0.0000020	**0.21 [#1]**	0.024	**0.0021 [#1]**	< 0.00010	**0.0015 [#1]**	0.015 [#1]	0.0091
(Duplicate)	13-Sep-2017	0.018	**0.0058 [#1]**	0.039	**0.000098 [#1]**	< 0.0010	0.00061	**3.7 [#1]**	< 0.00020	< 0.0000020	**0.20 [#1]**	0.025	**0.0021 [#1]**	< 0.00010	**0.0015 [#1]**	0.015 [#1]	0.0087

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
C-36X Well Site																	
C36 09-1-4	12-Aug-2017	0.0080	**0.011** [#1]	0.11	< 0.000020	< 0.0010	0.00026	**18** [#1]	< 0.00020	---	0.00031	0.0019	**0.0011** [#1]	< 0.00010	< 0.00020	0.00044	0.0068
C36-10-2-3	12-Aug-2017	0.0034	0.0027	0.32	**0.00017** [#1]	< 0.0010	0.0019	**9.9** [#1]	< 0.00020	---	0.00047	0.012	0.00062	< 0.00010	< 0.00020	**0.017** [#1]	0.0067
(Duplicate)	12-Aug-2017	0.0036	0.0027	0.32	**0.00017** [#1]	< 0.0010	0.0018	**9.7** [#1]	< 0.00020	---	0.00051	0.012	0.00061	< 0.00010	< 0.00020	**0.017** [#1]	0.0033
C36-10-1-3	12-Aug-2017	0.050	0.0022	< 0.020	< 0.000020	< 0.0010	0.00041	**12** [#1]	< 0.00020	---	0.00043	0.0072	0.00040	< 0.00010	< 0.00020	< 0.00010	0.0086
C36-10-3-3	12-Aug-2017	0.0063	**0.0051** [#1]	0.091	< 0.000020	< 0.0010	0.00032	**16** [#1]	< 0.00020	---	0.00032	0.0016	0.00098	< 0.00010	< 0.00020	0.0013	0.0062
C-38X Well Site																	
C38 08-1-4	12-Aug-2017	0.067	**0.023** [#1]	0.061	< 0.000020	< 0.0010	0.00034	**27** [#1]	< 0.00020	0.0000021	0.00033	0.0068	**0.0028** [#1]	< 0.00010	< 0.00020	0.0013	0.0047
	12-Sep-2017	**0.11** [#1]	**0.015** [#1]	0.047	< 0.000020	< 0.0010	< 0.00020	**20** [#1]	< 0.00020	< 0.0000020	0.00031	0.0076	0.00058	< 0.00010	< 0.00020	0.0019	< 0.0030
Former Fuel Tanks and Former Campsite Area																	
CAB 09-3-3	12-Aug-2017	0.014	0.0021	0.039	0.000040	< 0.0010	0.00079	**2.6** [#1]	< 0.00020	---	0.0094	0.0088	0.00060	< 0.00010	< 0.00020	0.0014	0.0074
FT-10-1-3	12-Aug-2017	0.011	0.00077	< 0.020	0.000036	< 0.0010	0.0023	< 0.060	< 0.00020	---	0.021	0.0049	**0.0016** [#1]	< 0.00010	< 0.00020	0.0036	0.0066
Background/Control Point Locations - Mainland East																	
MEBG-10-1-3	12-Aug-2017	0.0044	0.00096	0.022	0.000032	< 0.0010	0.00078	**2.8** [#1]	< 0.00020	< 0.0000020	0.0027	0.0052	0.00039	< 0.00010	< 0.00020	0.011	0.0040
	12-Sep-2017	0.0067	0.0014	0.025	0.000034	< 0.0010	0.00057	**3.6** [#1]	< 0.00020	< 0.0000020	0.0022	0.0057	0.00026	< 0.00010	< 0.00020	0.0090	0.0038
(Duplicate)	12-Sep-2017	0.0071	0.0014	0.027	0.000034	< 0.0010	0.0018	**3.6** [#1]	< 0.00020	< 0.0000020	0.0021	0.0055	0.00021	< 0.00010	< 0.00020	0.0088	0.0067
MEBG-12-2-3	20-Aug-2017	0.047	0.0012	0.051	**0.00019** [#1]	< 0.0010	**0.011** [#1]	0.20	0.00036	---	0.0033	0.024	0.00034	< 0.00010	< 0.00020	0.0066	0.015
MEBG-15-4-3	12-Aug-2017	0.0035	0.0021	< 0.020	0.000025	< 0.0010	0.0013	**2.0** [#1]	0.0012	---	0.0012	0.014	0.00041	< 0.00010	< 0.00020	0.0018	0.013
Mainland Sumps - Mainland Drilling Sump Area																	
MLS 08-1-4	16-Aug-2017	< 0.0030	0.0020	**1.9** [#1]	< 0.000020	< 0.0010	< 0.00020	**0.77** [#1]	< 0.00020	---	0.00042	0.0027	0.00037	< 0.00010	< 0.00020	0.00044	0.0074
MLS 08-3-4	16-Aug-2017	0.0047	0.0020	**2.2** [#1]	0.000089	< 0.0010	0.00049	< 0.60 [#1]	< 0.00020	---	0.0025	0.0037	0.00024	< 0.00010	< 0.00020	0.0022	0.0046
MLS-13-1-3	16-Aug-2017	0.0068	0.00050	0.23	**0.00024** [#1]	0.0010	**0.0064** [#1]	< 0.060	< 0.00020	---	0.0063	0.012	0.00035	< 0.00010	< 0.00020	**0.027** [#1]	0.011
Mainland Sumps - Well Services Sump Area																	
MLS 02-10-8	16-Aug-2017	< 0.0030	0.0037	**1.8** [#1]	< 0.000020	< 0.0010	0.00088	**2.3** [#1]	< 0.00020	---	0.00058	0.00096	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0078
MLS 09-9-2	16-Aug-2017	0.0031	0.00072	0.14	**0.00029** [#1]	< 0.0010	0.0023	**0.32** [#1]	< 0.00020	---	0.00033	0.0046	0.00025	< 0.00010	< 0.00020	0.0066	0.0091

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
MLS-10-2-3	16-Aug-2017	0.0033	0.0019	**2.0** [#1]	< 0.000020	< 0.0010	< 0.00020	**0.74** [#1]	< 0.00020	---	0.00029	0.0085	**0.0013** [#1]	< 0.00010	< 0.00020	0.0075	0.0058
MLS-13-3-3	16-Aug-2017	< 0.0030	0.00034	0.19	0.000054	< 0.0010	0.00085	< 0.060	< 0.00020	---	0.00054	0.0056	< 0.00020	< 0.00010	< 0.00020	0.0041	0.0072
MLS-13-4-3	16-Aug-2017	0.0082	**0.0065** [#1]	0.23	< 0.000020	< 0.0010	0.00068	**8.1** [#1]	< 0.00020	---	0.00034	0.0096	< 0.00020	< 0.00010	< 0.00020	0.0034	0.0071
Mainland Sumps - Sumps 1 Through 6																	
MLS 09-1-3	16-Aug-2017	**0.58** [#1]	0.0015	0.42	**0.00027** [#1]	0.0012	0.0032	**1.6** [#1]	0.0021	---	0.00027	0.0082	0.00022	< 0.00010	< 0.00020	0.0089	0.016
(Duplicate)	16-Aug-2017	**0.51** [#1]	0.0015	0.42	**0.00026** [#1]	0.0011	0.0023	**1.4** [#1]	0.0017	---	0.00034	0.0076	0.00021	< 0.00010	< 0.00020	0.0089	0.015
MLS 09-2-3	16-Aug-2017	0.012	0.00051	0.51	0.000072	< 0.0010	0.0028	< 0.060	0.00023	---	0.0023	0.0038	0.00020	< 0.00010	< 0.00020	**0.019** [#1]	0.024
MLS-13-2-3	16-Aug-2017	0.0086	0.00074	0.41	**0.00011** [#1]	< 0.0010	**0.0089** [#1]	< 0.060	< 0.00020	---	0.0043	0.0060	0.00028	< 0.00010	< 0.00020	0.011	0.0095
MLS-13-9-3	16-Aug-2017	0.0086	0.00040	< 0.020	0.000020	< 0.0010	**0.0046** [#1]	< 0.060	< 0.00020	---	0.0017	0.0026	< 0.00020	< 0.00010	< 0.00020	0.0023	0.0037
MLS-14-2-3	16-Aug-2017	0.019	**0.0098** [#1]	0.032	< 0.000020	< 0.0010	0.00062	**19** [#1]	< 0.00020	---	0.00051	0.011	0.00021	< 0.00010	< 0.00020	0.00040	0.0073
MLS-14-5-4	16-Aug-2017	0.0036	0.00061	0.25	< 0.000020	< 0.0010	0.0013	**0.82** [#1]	< 0.00020	---	0.00063	0.0036	< 0.00020	< 0.00010	< 0.00020	0.0034	**0.039** [#1]
C-27X Sump																	
C27 08-1-4	13-Aug-2017	0.0091	0.0044	0.034	< 0.000020	< 0.0010	0.0013	**7.1** [#1]	0.00026	---	0.0092	0.030	0.00033	< 0.00010	< 0.00020	0.0075	0.0064
C27-16-2-3	15-Aug-2017	0.012	0.00094	0.12	**0.00023** [#1]	< 0.0010	**0.0058** [#1]	< 0.060	0.00030	---	0.00081	0.011	0.00048	< 0.00010	< 0.00020	**0.024** [#1]	0.014
(Duplicate)	15-Aug-2017	0.012	0.00098	0.11	**0.00024** [#1]	< 0.0010	**0.0057** [#1]	< 0.060	0.00028	---	0.00084	0.011	0.00048	< 0.00010	< 0.00020	**0.025** [#1]	0.013
C27-16-4-3	13-Aug-2017	0.0034	0.00099	0.28	**0.00012** [#1]	< 0.0010	0.0016	0.13	< 0.00020	---	0.00072	0.016	0.00023	< 0.00010	< 0.00020	**0.020** [#1]	0.0088
Bear Island BT1																	
BI BT1 09-1-4	10-Aug-2017	0.0048	0.00052	0.035	**0.00050** [#1]	< 0.0010	**0.0044** [#1]	**6.0** [#1]	< 0.00020	---	0.00054	0.029	0.00050	< 0.00010	< 0.00020	**0.025** [#1]	0.016
BIBT1-15-1-3.5	10-Aug-2017	0.015	**0.011** [#1]	< 0.020	< 0.000020	0.0012	0.00070	**28** [#1]	< 0.00020	---	0.0053	0.015	**0.0014** [#1]	< 0.00010	< 0.00020	0.015 [#1]	0.0061
BIBT1-15-2-4	10-Aug-2017	0.032	**0.032** [#1]	< 0.020	< 0.000020	0.0020	0.00041	**34** [#1]	< 0.00020	---	0.0036	0.0045	0.00096	< 0.00010	< 0.00020	0.0040	0.0056
BIBT1-15-4-4	11-Aug-2017	0.0082	0.0021	0.028	0.000073	< 0.0010	0.0012	**1.1** [#1]	< 0.00020	---	0.0027	0.0091	0.00032	< 0.00010	< 0.00020	0.0063	0.0073
BIBT1-15-5-3	11-Aug-2017	0.0040	0.00023	< 0.020	**0.00012** [#1]	< 0.0010	0.0020	< 0.060	< 0.00020	---	0.0026	0.0030	< 0.00020	< 0.00010	< 0.00020	0.0017	0.0090
BIBT1-15-7-4	11-Aug-2017	0.0076	0.00056	< 0.020	**0.00017** [#1]	< 0.0010	0.0015	**2.9** [#1]	< 0.00020	---	0.00095	0.0091	< 0.00020	< 0.00010	< 0.00020	0.0026	0.025
BIBT1-16-1-3	11-Aug-2017	0.0052	0.00071	0.028	**0.00010** [#1]	< 0.0010	0.0010	**5.3** [#1]	< 0.00020	---	0.0035	0.0067	< 0.00020	< 0.00010	< 0.00020	0.0038	**0.037** [#1]
BIBT1-16-2-3	11-Aug-2017	0.0049	0.0022	0.034	**0.00016** [#1]	< 0.0010	0.00084	**13** [#1]	< 0.00020	---	0.0025	0.017	0.00025	< 0.00010	< 0.00020	0.0026	**0.031** [#1]

Table 5

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIBT1-16-3-3	10-Aug-2017	0.013	0.0011	0.097	0.000049	< 0.0010	0.0012	< 0.060	< 0.00020	---	0.014	0.0071	0.00033	< 0.00010	< 0.00020	0.0037	< 0.0030
	11-Aug-2017	< 0.0030	0.0016	0.021	0.000029	< 0.0010	0.00056	**4.1 [#1]**	< 0.00020	---	0.0028	0.0056	< 0.00020	< 0.00010	< 0.00020	0.0029	0.0097
BI-14-13-3	11-Aug-2017	0.0041	0.0030	0.036	0.000023	< 0.0010	0.00093	**0.62 [#1]**	< 0.00020	---	0.0023	0.0030	< 0.00020	< 0.00010	< 0.00020	0.0023	**1.1 [#1]**
Bear Island West Sumps (Sumps 1-5)																	
BI 08-6-4	11-Aug-2017	0.026	**0.0071 [#1]**	< 0.020	**0.000091 [#1]**	0.0012	0.00096	**56 [#1]**	< 0.00020	---	0.0071	0.034	**0.0015 [#1]**	< 0.00010	< 0.00020	0.0050	0.017
BIS 97-1-3	22-Nov-2017	0.0094	0.0021	< 0.020	0.000030	< 0.0010	0.00099	**22 [#1]**	< 0.00020	< 0.0000020	0.0051	0.0092	**0.0012 [#1]**	< 0.00010	< 0.00020	0.0019	0.0041
BIS-10-3-DP	11-Aug-2017	---	---	---	---	---	---	0.16	---	---	---	---	---	---	---	---	---
BIS-16-1-3	10-Aug-2017	0.013	0.0014	0.038	**0.00024 [#1]**	< 0.0010	0.0013	**9.4 [#1]**	< 0.00020	---	0.0013	0.017	0.00042	< 0.00010	< 0.00020	0.0092	0.011
(Duplicate)	10-Aug-2017	0.0081	0.0015	0.039	**0.00025 [#1]**	< 0.0010	0.0014	**10 [#1]**	< 0.00020	---	0.0013	0.017	0.00036	< 0.00010	< 0.00020	0.0090	0.011
BIS-16-7-5	11-Aug-2017	0.015	**0.011 [#1]**	< 0.020	< 0.000020	< 0.0010	0.00056	**43 [#1]**	< 0.00020	---	0.0069	0.0026	0.00077	< 0.00010	< 0.00020	0.0062	0.0035
BIS-16-8-3	11-Aug-2017	0.019	0.0016	0.023	**0.000091 [#1]**	< 0.0010	0.0019	**4.3 [#1]**	< 0.00020	---	0.0016	0.042	0.00082	< 0.00010	< 0.00020	**0.027 [#1]**	0.026
BIS-16-10-4	11-Aug-2017	0.011	0.0011	< 0.020	**0.00022 [#1]**	< 0.0010	**0.0049 [#1]**	**3.4 [#1]**	< 0.00020	---	0.0045	0.017	0.00048	< 0.00010	< 0.00020	**0.021 [#1]**	0.0055
BIS-16-11-4	11-Aug-2017	0.012	0.0021	< 0.020	0.000057	< 0.0010	0.0016	**72 [#1]**	< 0.00020	---	0.0038	0.019	**0.0011 [#1]**	< 0.00010	< 0.00020	0.011	0.011
BIS-16-12-5	11-Aug-2017	0.010	**0.012 [#1]**	< 0.020	< 0.000020	< 0.0010	< 0.00020	**29 [#1]**	< 0.00020	---	0.0030	0.0027	0.00050	< 0.00010	< 0.00020	0.0062	< 0.0030
Bear Island Flare Pit																	
BIFP-16-1-3	10-Aug-2017	0.015	0.0036	0.16	0.000081	< 0.0010	0.0011	0.12	0.00083	---	**0.17 [#1]**	0.0079	0.00048	< 0.00010	< 0.00020	**0.031 [#1]**	< 0.0030
BIFP-16-2-3	10-Aug-2017	0.0062	0.0015	0.095	0.000041	< 0.0010	0.0011	< 0.060	< 0.00020	---	0.017	0.0075	0.00034	< 0.00010	< 0.00020	0.0056	0.0034
BIFP-16-3-3	10-Aug-2017	0.013	0.0011	0.097	0.000049	< 0.0010	0.0012	< 0.060	< 0.00020	---	0.014	0.0071	0.00033	< 0.00010	< 0.00020	0.0037	< 0.0030
Former Bear Island Battery and N-42X Well Site																	
BIB 98-2-5	10-Aug-2017	0.0094	0.0022	< 0.020	0.000080	< 0.0010	0.0016	**110 [#1]**	< 0.00020	---	0.0022	0.030	0.00076	< 0.00010	< 0.00020	0.0034	0.0097
BIN42-10-1-5	10-Aug-2017	0.024	**0.013 [#1]**	0.025	0.000050	< 0.0010	0.0014	**39 [#1]**	< 0.00020	---	0.0015	0.022	0.00081	< 0.00010	< 0.00020	0.0064	0.017
(Duplicate)	10-Aug-2017	0.024	**0.013 [#1]**	0.021	0.000037	< 0.0010	0.00099	**39 [#1]**	< 0.00020	---	0.0015	0.021	0.00075	< 0.00010	< 0.00020	0.0064	0.013
Former Flow Line Releases Near N-44X, N-45X and O-46X Well Sites																	
BI O46-09-DP-1	14-Aug-2017	0.0097	0.0010	< 0.020	**0.00012 [#1]**	< 0.0010	0.0011	**18 [#1]**	< 0.00020	---	0.0034	0.051	0.00078	< 0.00010	< 0.00020	0.0080	0.028
BISS2-09-DP-1	14-Aug-2017	0.0084	**0.0071 [#1]**	< 0.020	< 0.000020	< 0.0010	< 0.00020	**9.0 [#1]**	< 0.00020	< 0.0000020	0.0017	0.0070	< 0.00020	< 0.00010	< 0.00020	0.0023	0.0087
	12-Sep-2017	0.0052	0.00098	< 0.020	0.000085	< 0.0010	0.0019	**0.87 [#1]**	< 0.00020	< 0.0000020	0.0014	0.011	< 0.00020	< 0.00010	< 0.00020	0.0051	0.0070

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BISS2-09-DP-2	14-Aug-2017	0.0062	0.00075	< 0.020	**0.00015** [#1]	< 0.0010	0.0011	**2.2** [#1]	< 0.00020	< 0.0000020	0.0013	0.013	< 0.00020	< 0.00010	< 0.00020	0.0072	0.010
	12-Sep-2017	0.0066	0.0047	< 0.020	< 0.000020	< 0.0010	0.0016	**6.9** [#1]	< 0.00020	< 0.0000020	0.0012	0.0067	< 0.00020	< 0.00010	< 0.00020	0.0011	0.023
BISS3-09-DP-1	14-Aug-2017	0.045	**0.0086** [#1]	< 0.020	< 0.000020	< 0.0010	< 0.00020	**23** [#1]	< 0.00020	---	0.0014	0.016	0.00024	< 0.00010	< 0.00020	0.0012	0.0072
BISS3-09-DP-2	14-Aug-2017	0.015	0.0010	< 0.020	0.000057	< 0.0010	0.0034	0.082	< 0.00020	---	0.0034	0.0091	< 0.00020	< 0.00010	< 0.00020	0.0019	0.0056
Bear Island East Sump (Sump 6)																	
BI 08-2-3	15-Aug-2017	0.026	0.00099	< 0.020	**0.00035** [#1]	< 0.0010	0.0014	**120** [#1]	< 0.00020	---	0.00071	0.043	0.00099	< 0.00010	< 0.00020	0.0087	0.020
BI-13-1-4	15-Aug-2017	0.0069	0.0014	0.021	**0.00010** [#1]	< 0.0010	0.0015	**9.1** [#1]	< 0.00020	---	0.0031	0.015	0.00080	< 0.00010	< 0.00020	0.011	0.021
BI-13-2-4.5	15-Aug-2017	0.018	**0.0082** [#1]	< 0.020	< 0.000020	0.0011	0.00061	**43** [#1]	< 0.00020	---	0.0048	0.016	**0.0012** [#1]	< 0.00010	< 0.00020	0.0018	0.0047
BI-13-3-4.5	15-Aug-2017	0.0090	0.0012	< 0.020	**0.00017** [#1]	< 0.0010	0.0025	**1.0** [#1]	< 0.00020	---	0.019	0.022	**0.0018** [#1]	< 0.00010	< 0.00020	0.010	0.015
	22-Nov-2017	0.0081	0.0016	< 0.020	0.000071	< 0.0010	0.00094	**4.0** [#1]	< 0.00020	< 0.0000020	0.017	0.019	**0.0012** [#1]	< 0.00010	< 0.00020	0.0083	0.012
BIWS-16-1-4	15-Aug-2017	0.0056	0.0022	< 0.020	< 0.000020	< 0.0010	0.0014	**69** [#1]	< 0.00020	---	0.00068	0.035	0.00056	< 0.00010	< 0.00020	0.0093	0.020
Background/Control Point Locations - Bear Island																	
BIBG-10-1-4	11-Aug-2017	0.0074	0.00025	< 0.020	**0.00023** [#1]	< 0.0010	0.0029	0.072	< 0.00020	---	0.014	0.0040	**0.0011** [#1]	< 0.00010	< 0.00020	0.0052	0.013
BIBG-12-2-4	15-Aug-2017	0.017	0.00054	< 0.020	**0.00039** [#1]	< 0.0010	**0.0053** [#1]	< 0.060	< 0.00020	---	0.0010	0.0085	0.00031	< 0.00010	< 0.00020	0.0051	0.0087
Goose Island																	
GIQ8-10-2-4	20-Aug-2017	0.012	0.00097	0.033	**0.00026** [#1]	< 0.0010	0.0022	**2.7** [#1]	< 0.00020	0.0000020	0.00061	0.011	0.00029	< 0.00010	< 0.00020	0.0019	0.015
	12-Sep-2017	0.0068	0.00030	< 0.020	**0.00026** [#1]	< 0.0010	0.0022	**0.31** [#1]	< 0.00020	< 0.0000020	0.00088	0.0081	< 0.00020	< 0.00010	< 0.00020	0.0037	0.0058
Background/Control Point Locations - Goose Island																	
GIBG-10-2-3	20-Aug-2017	0.0059	0.00065	0.036	**0.00017** [#1]	< 0.0010	0.0014	**0.43** [#1]	< 0.00020	< 0.0000020	0.0014	0.0066	0.00033	< 0.00010	< 0.00020	0.0056	0.0094
(Duplicate)	20-Aug-2017	0.0055	0.00060	0.030	**0.00016** [#1]	< 0.0010	0.0018	**0.44** [#1]	< 0.00020	< 0.0000020	0.0013	0.0068	< 0.00020	< 0.00010	< 0.00020	0.0054	0.0097
	12-Sep-2017	0.0042	0.00026	0.036	**0.00073** [#1]	< 0.0010	0.0032	< 0.060	< 0.00020	< 0.0000020	0.0014	0.011	< 0.00020	< 0.00010	< 0.00020	0.0093	0.024

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)
7. Superscript [#2] - Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.
8. Superscript [#3] - Detection limits raised due to dilution to bring analyte within the calibrated range.

Advisian
WorleyParsons Group

Table 6A

Groundwater Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
Biocell Sumps																	
BC1-NORTH	22-Jun-2017	**0.15 [#1]**	0.0039	< 0.020	0.000061	< 0.0010	**0.0050 [#1]**	**0.47 [#1]**	0.00037	---	0.018	0.0055	0.00050	< 0.00010	< 0.00020	0.0016	< 0.0030
BC1-SOUTH	22-Jun-2017	**0.11 [#1]**	0.0012	< 0.020	0.000051	< 0.0010	**0.0051 [#1]**	**0.38 [#1]**	0.00034	---	0.013	0.0038	0.00059	< 0.00010	< 0.00020	0.0018	< 0.0030
BC2-NORTH	22-Jun-2017	0.047	0.00061	< 0.020	< 0.000020	< 0.0010	0.0029	< 0.060	< 0.00020	---	0.021	0.0025	0.00070	< 0.00010	< 0.00020	0.0032	< 0.0030
BC2-SOUTH	22-Jun-2017	0.10 [#1]	0.0016	0.058	0.000075	< 0.0010	0.0036	0.22	0.00032	---	0.027	0.0034	0.00081	< 0.00010	< 0.00020	0.0056	< 0.0030

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)
7. Superscript [#2] - Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.

Advisian
WorleyParsons Group

Table 6B

Surface Water Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
Biocells, ARB and B-33X Area																	
ARB-17-SW01	12-Aug-2017	0.0081	0.00096	< 0.020	0.000059	< 0.0010	0.0011	**0.33** [#1]	< 0.00020	---	0.014	0.014	**0.0019** [#1]	< 0.00010	0.00023	0.011	0.0054
ARB-17-SW02	12-Aug-2017	0.0072	0.00088	0.023	0.000029	< 0.0010	0.00028	0.30 [#1]	< 0.00020	---	0.0092	0.0048	0.00044	< 0.00010	< 0.00020	0.0091	< 0.0030
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area																	
BOS SW01	18-Aug-2017	0.030	0.00042	0.030	< 0.000020	< 0.0010	0.00025	0.12	< 0.00020	---	0.0017	0.00069	< 0.00020	< 0.00010	< 0.00020	0.0010	< 0.0030
(Duplicate)	18-Aug-2017	0.041	0.00045	0.031	< 0.000020	< 0.0010	0.00064	0.13	< 0.00020	---	0.0019	0.0010	0.00020	< 0.00010	< 0.00020	0.0010	0.0035
C-36X Well																	
C36 SW01	12-Aug-2017	0.064	**0.0061** [#1]	< 0.020	**0.000092** [#1]	0.0012	0.0018	**3.8** [#1]	0.00064	---	0.00039	0.0041	0.00035	< 0.00010	< 0.00020	0.00023	0.017
Mainland Sumps - Mainland Drilling Sump Area																	
MLS-14-9-SW	16-Aug-2017	0.016	0.0028	0.023	< 0.000020	< 0.0010	0.00077	**0.63** [#1]	< 0.00020	---	0.0016	0.0023	0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
Mainland Sumps - Sumps 1 Through 6																	
MLS SW05	21-Aug-2017	0.089	0.0014	0.037	< 0.000020	< 0.0010	0.00053	**0.54** [#1]	< 0.00020	---	0.0052	0.0038	0.00040	< 0.00010	< 0.00020	0.0021	< 0.0030
MLS-14-3-SW	16-Aug-2017	**0.25** [#1]	0.0013	< 0.020	0.000046	< 0.0010	0.0028	**0.47** [#1]	0.00021	---	0.00049	0.0029	< 0.00020	< 0.00010	< 0.00020	< 0.00010	**0.039** [#1]
MLS-14-4-SW	16-Aug-2017	0.034	0.0017	< 0.020	< 0.000020	< 0.0010	0.0010	0.26	< 0.00020	---	0.00036	0.0026	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0053
(Duplicate)	16-Aug-2017	0.038	0.0016	< 0.020	< 0.000020	< 0.0010	0.0016	0.24	< 0.00020	---	0.00028	0.0027	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0070
MLS-14-8-SW	21-Aug-2017	0.064	0.0027	0.021	< 0.000020	< 0.0010	0.0013	**0.63** [#1]	< 0.00020	---	0.00048	0.0024	0.00026	< 0.00010	< 0.00020	0.00011	< 0.0030
Bear Island West Sumps (Sumps 1-5)																	
BI-13-11	14-Aug-2017	**8.3** [#1]	**0.0073** [#1]	0.28	**0.00049** [#1]	**0.013** [#1]	**0.0094** [#1]	**76** [#1]	**0.0080** [#1]	---	0.0016	0.093	**0.0017** [#1]	< 0.00010	< 0.00020	0.00085	**0.34** [#1]
BI SW05	11-Aug-2017	0.0062	0.0014	< 0.020	0.000030	< 0.0010	< 0.00020	0.18	< 0.00020	---	< 0.00020	0.00052	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
Bear Island Flare Pit																	
BIFP-16-SW1	10-Aug-2017	0.061	0.0013	< 0.020	0.000038	< 0.0010	0.00050	**0.52** [#1]	< 0.00020	---	0.0025	0.0014	< 0.00020	< 0.00010	< 0.00020	0.00037	< 0.0030
	27-Sep-2017	**0.13** [#1]	0.0045	< 0.020	**0.000097** [#1]	< 0.0010	0.0015	**6.1** [#1]	0.00028	---	0.0012	0.0031	< 0.00020	< 0.00010	< 0.00020	0.00028	0.010
BIFP-16-SW2	10-Aug-2017	0.041	0.0011	< 0.020	< 0.000020	< 0.0010	0.00045	**0.32** [#1]	< 0.00020	---	0.0020	0.0015	< 0.00020	< 0.00010	< 0.00020	0.00044	< 0.0030
	27-Sep-2017	0.033	0.00073	< 0.020	< 0.000020	< 0.0010	0.00050	**0.39** [#1]	< 0.00020	---	0.0016	0.0013	< 0.00020	< 0.00010	< 0.00020	0.00025	< 0.0030
BIFP-17-SW1	27-Sep-2017	0.016	0.00070	< 0.020	< 0.000020	< 0.0010	0.00041	**0.34** [#1]	< 0.00020	---	0.0016	0.0014	< 0.00020	< 0.00010	< 0.00020	0.00023	< 0.0030
BIFP-17-SW2	27-Sep-2017	**2.3** [#1]	**0.016** [#1]	< 0.020	**0.00036** [#1]	0.0061	**0.0071** [#1]	**22** [#1]	0.0037	---	0.0020	0.011	0.00034	< 0.00010	< 0.00020	0.00057	**0.043** [#1]

Table 6B

Surface Water Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BI SW09	10-Aug-2017	**0.64** [#1]	**0.0092** [#1]	< 0.020	**0.00016** [#1]	0.0017	0.0022	**23** [#1]	0.0030	---	0.0026	0.0072	0.00033	< 0.00010	< 0.00020	0.00088	0.016
Former Bear Island Battery and N-42X Well Site																	
BIN42-SW01	10-Aug-2017	**0.11** [#1]	0.0012	< 0.020	0.000088	< 0.0010	0.0018	**0.49** [#1]	< 0.00020	---	0.0012	0.0017	< 0.00020	< 0.00010	< 0.00020	0.00023	0.0035
Bear Island East Sump (Sump 6)																	
BIS6-17-SW01	27-Sep-2017	0.043	0.00087	< 0.020	< 0.000020	< 0.0010	0.00033	0.16	< 0.00020	---	0.00030	0.00087	< 0.00020	< 0.00010	< 0.00020	0.00012	0.0045
BI SW-13-1	14-Aug-2017	**0.26** [#1]	0.0039	< 0.020	0.000048	< 0.0010	0.00034	**7.5** [#1]	0.00048	---	0.00065	0.0021	< 0.00020	< 0.00010	< 0.00020	0.00024	0.0049
Goose Island																	
GI SW05	20-Aug-2017	0.023	0.00088	< 0.020	< 0.000020	< 0.0010	0.00064	0.068	< 0.00020	---	0.0017	0.0010	0.00022	< 0.00010	< 0.00020	0.00031	< 0.0030
(Duplicate)	20-Aug-2017	0.023	0.00089	< 0.020	< 0.000020	< 0.0010	0.00073	0.064	< 0.00020	---	0.0016	0.0011	< 0.00020	< 0.00010	< 0.00020	0.00035	< 0.0030

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)
7. Superscript [#2] - Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.

Advisian
WorleyParsons Group

Table 7

Groundwater Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
Background/Control Point Locations - Mainland West												
MWBG-10-1-3	17-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
Former Battery #3 and Battery #3 Flare Pit												
BT3 02-32-6	13-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000066	< 0.00010	0.00010	**0.000052** [#1]	< 0.00020
BT3 02-34-4	13-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
BT3 99-21-12	13-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.00019	< 0.000020	< 0.00020
BT3 99-23-13	13-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
(Duplicate)	13-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
C-30X/C-32X, Bosworth Creek and Bosworth Delta Area												
BOS-DP-13-2-1.35	18-Aug-2017	< 0.00010	< 0.000050	**0.000030** [#1]	**0.000042** [#1]	< 0.0000075	**0.00033** [#1]	0.000068	< 0.00010	0.00032	**0.00023** [#1]	< 0.00020
BOS-DP-13-3-2	18-Aug-2017	0.00015	< 0.000050	**0.000086** [#1]	**0.00013** [#1]	**0.000021** [#1]	**0.00088** [#1]	0.00017	< 0.00010	**0.00089** [#1]	**0.00061** [#1]	< 0.00020
BOS-DP-13-4-3	18-Aug-2017	0.00047	< 0.000050	< 0.000010	**0.000060** [#1]	< 0.0000075	**0.00028** [#1]	0.0018	0.0011 [#1,2]	**0.0035** [#1]	**0.00048** [#1]	< 0.00020
Background/Control Point Locations - Mainland Central												
MCBG-10-1-3	12-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
MCBG-12-1-2	20-Aug-2017	< 0.00010	< 0.000050	**0.000032** [#1]	**0.000068** [#1]	< 0.0000075	**0.00039** [#1]	< 0.000050	< 0.00010	0.00036	**0.00028** [#1]	< 0.00020
Former Refinery Area												
NWR 09-1-20	13-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00022	**0.0020** [#1]	0.00034	< 0.000020	< 0.00020
NWR 09-3-20	15-Aug-2017	< 0.00010	< 0.000050	0.000012 [#1]	< 0.0000085	< 0.0000075	**0.000047** [#1]	0.000064	0.00038	0.00015	**0.000038** [#1]	< 0.00020
NWR 09-4-5	15-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000061	0.00074	< 0.000050	0.000024	< 0.00020
NWR 98-13-21	15-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	0.000021	0.000057	0.00028	0.00021	< 0.000020	< 0.00020

Groundwater Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
Background/Control Point Locations - Mainland East												
MEBG-10-1-3	12-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	**0.000042** [#1]	< 0.000050	< 0.00010	0.000080	**0.000037** [#1]	< 0.00020
MEBG-12-2-3	20-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
MEBG-15-4-3	12-Aug-2017	0.00016	< 0.000050	**0.000051** [#1]	**0.000040** [#1]	0.000013	**0.00032** [#1]	0.00016	**0.0037** [#1]	**0.00044** [#1]	**0.00023** [#1]	< 0.00020
Background/Control Point Locations - Bear Island												
BIBG-10-1-4	11-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
BIBG-12-2-4	15-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
Background/Control Point Locations - Goose Island												
GIBG-10-2-3	20-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.000053	< 0.000020	< 0.00020
(Duplicate)	20-Aug-2017	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Benzo(a)Pyrene Total Potency Equivalent (ESRD)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits
7. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)
8. Superscript [#2] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

Advisian
WorleyParsons Group

Table 8
Battery #3 Soil Treatment Results
General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Chloride (Calculated) (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Battery #3 Soil Treatment Pad - 2017 Results																			
BT3-1-S	19-Jul-2017		**7.4** [#1]	9.3	7.63	620	1300 [#2]	9.5	65	910	480	480	980	1000	7.3	50	700	370	77
BT3-1-N	19-Jul-2017		**8.0** [#1]	6.3	7.58	860	1200 [#2]	11	110	740	630	530	750	740	6.7	70	460	390	62
BT3-2-N	19-Jul-2017		**13** [#1]	6.8	7.52	1500	2300 [#2]	14	200	1100	830	1000	1500	1500	9.1	130	710	550	67
BT3-2-S	19-Jul-2017		**7.9** [#1]	8.0	7.63	730	1600 [#2]	11	76	850	460	440	950	960	6.5	46	510	280	60
BT3-2-S-1	19-Jul-2017		**9.2** [#1]	10	7.51	770	2000 [#2]	10	81	1100	620	640	1700	1700	8.4	68	920	520	84
BT3-2-S-2	19-Jul-2017		**10** [#1]	9.5	7.45	930	2500 [#2]	11	110	1100	690	770	2100	2100	9.4	89	940	570	82
BT3-2-S-3	19-Jul-2017		**9.8** [#1]	9.5	7.39	950	2300 [#2]	13	93	1100	630	720	1700	1700	9.7	71	860	480	76
BT3-2-S-4	19-Jul-2017		**7.0** [#1]	10	7.47	530	1800 [#2]	9.9	55	900	460	450	1500	1500	8.4	47	760	390	84
BT3-2-S-5	19-Jul-2017		**7.5** [#1]	11	7.53	490	1900 [#2]	9.6	55	940	400	380	1500	1400	7.3	42	720	300	76
BT3-3-N	19-Jul-2017		**9.9** [#1]	7.2	7.58	1100	2000 [#2]	14	120	950	730	760	1400	1400	9.8	80	650	500	69
BT3-3-S	19-Jul-2017		**9.3** [#1]	5.6	7.52	1100	1100 [#2]	11	120	730	530	750	760	750	7.7	81	500	360	68
BT3-4-N	19-Jul-2017		**10** [#1]	7.5	7.58	1100	1900 [#2]	14	130	1000	670	770	1300	1300	9.5	90	680	450	68
(Duplicate)	19-Jul-2017		**11** [#1]	7.9	7.58	1200	2100 [#2]	14	140	1100	700	780	1400	1400	9.4	90	710	460	65
BT3-4-S	19-Jul-2017		**7.6** [#1]	7.3	7.60	740	1200 [#2]	13	84	790	550	480	780	780	8.1	54	510	360	65
BT3-5-N	19-Jul-2017		**8.5** [#1]	4.7	7.58	1100	1300 [#2]	13	110	610	880	700	830	830	8.6	71	390	570	64
BT3-5-S	19-Jul-2017		**7.3** [#1]	5.2	7.56	870	1200 [#2]	15	93	600	690	570	770	790	9.6	61	400	460	66
BT3-6-N	19-Jul-2017		**14** [#1]	8.2	7.60	1400	3300 [#2]	16	190	1200	860	890	2200	2200	11	130	800	560	66
BT3-6-S	19-Jul-2017		**9.4** [#1]	8.4	7.65	810	2400 [#2]	12	110	950	540	470	1400	1400	6.7	61	550	310	58
BT3-7-N	19-Jul-2017		**12** [#1]	7.8	7.56	1400	2900 [#2]	17	160	1100	980	840	1800	1800	10	96	700	600	61
BT3-7-N-1	19-Jul-2017		**16** [#1]	11	7.46	1600	4800 [#2]	18	140	1700	600	1100	3400	3400	13	98	1200	420	71
BT3-7-N-2	19-Jul-2017		**9.2** [#1]	7.2	7.46	950	2200 [#2]	17	71	860	420	640	1500	1500	11	48	580	280	67
BT3-7-N-3	19-Jul-2017		**14** [#1]	10	7.57	1300	3800 [#2]	16	120	1400	800	880	2500	2500	11	77	950	530	66
BT3-7-N-4	19-Jul-2017		**9.9** [#1]	9.2	7.55	860	2800 [#2]	12	100	1100	610	570	1800	1800	8.2	66	710	410	66
BT3-7-N-5	19-Jul-2017		**11** [#1]	9.4	7.52	940	2700 [#2]	17	130	1200	670	660	1900	1900	12	89	810	470	70
BT3-7-S	19-Jul-2017		**6.8** [#1]	5.9	7.61	730	1300 [#2]	13	72	630	580	490	830	870	8.4	48	420	380	67
BT3-8-N	19-Jul-2017		**17** [#1]	9.6	7.47	1800	4900 [#2]	18	190	1600	860	1300	3500	3500	13	140	1200	620	72
(Duplicate)	19-Jul-2017		**18** [#1]	9.4	7.55	2000	4900 [#2]	18	220	1700	970	1300	3300	3300	12	150	1100	650	67
BT3-8-S	19-Jul-2017		**14** [#1]	11	7.54	1300	3900 [#2]	16	130	1500	650	920	2800	2800	11	89	1100	460	71
BT3-9-N	19-Jul-2017		**18** [#1]	11	7.41	2000	4800 [#2]	20	180	1900	830	1400	3400	3300	14	120	1300	580	69
BT3-9-S	19-Jul-2017		**17** [#1]	**14** [#1]	7.57	1500	5200 [#2]	19	150	2100	720	930	3300	3300	12	94	1300	460	63
BT3-10-N	19-Jul-2017		**15** [#1]	9.0	7.47	1600	3000 [#2]	16	180	1400	840	1200	2200	2200	11	130	1000	600	72
BT3-10-S	19-Jul-2017		**14** [#1]	9.8	7.54	1300	3400 [#2]	14	140	1400	570	960	2500	2400	10	100	1000	420	72
BT3-11-N	20-Jul-2017		**15** [#1]	11	7.55	1500	3700 [#2]	17	150	1600	730	1000	2600	2600	12	100	1100	510	69
BT3-11-S	20-Jul-2017		**12** [#1]	11	7.56	1000	3100 [#2]	13	130	1400	550	640	1900	1900	8.3	78	860	340	62
BT3-12-N	20-Jul-2017		**16** [#1]	11	7.36	1500	4000 [#2]	16	170	1600	880	910	2400	2400	9.4	100	990	530	60
(Duplicate)	20-Jul-2017		**14** [#1]	11	7.45	1300	3700 [#2]	15	150	1500	820	780	2200	2100	8.7	89	900	470	58
BT3-12-S	20-Jul-2017		**16** [#1]	11	7.42	1700	4000 [#2]	17	190	1700	920	980	2300	2300	10	110	1000	540	58
BT3-12-S-1	20-Jul-2017		**9.5** [#1]	**13** [#1]	7.53	630	2800 [#2]	11	73	1300	580	460	2100	2100	8.4	54	940	420	74
BT3-12-S-2	20-Jul-2017		**15** [#1]	12 [#1]	7.53	1200	4400 [#2]	14	150	1700	710	780	2900	2900	9.6	100	1100	470	66
BT3-12-S-3	20-Jul-2017		**10** [#1]	12 [#1]	7.51	750	3400 [#2]	12	85	1300	650	580	2600	2600	9.1	66	1000	500	77
BT3-12-S-4	20-Jul-2017		**12** [#1]	12 [#1]	7.52	1000	3200 [#2]	13	110	1500	610	720	2300	2300	9.8	79	1100	450	72
BT3-12-S-5	20-Jul-2017		**14** [#1]	**13** [#1]	7.53	1200	4500 [#2]	15	140	1800	710	810	3100	3100	10	97	1200	490	69
BT3-13-N	20-Jul-2017		**14** [#1]	9.1	7.46	1500	3100 [#2]	17	180	1400	930	820	1700	1700	9.0	97	760	500	54
BT3-13-S	20-Jul-2017		**8.4** [#1]	8.9	7.65	700	1900 [#2]	11	88	940	880	410	1100	1100	6.5	51	550	510	58
BT3-14-N	20-Jul-2017		**8.7** [#1]	7.7	7.88	910	1800 [#2]	20	110	920	990	440	900	880	9.7	53	450	480	49
BT3-14-S	20-Jul-2017		**8.0** [#1]	8.1	7.78	730	1800 [#2]	17	99	880	1200	360	880	880	8.1	49	430	580	49
BT3-15-N	20-Jul-2017		**7.4** [#1]	8.0	7.71	680	1200 [#2]	23	59	810	770	330	580	590	11	29	400	370	49
BT3-15-S	20-Jul-2017		**6.9** [#1]	5.6	7.78	810	780 [#2]	21	81	620	1100	470	460	460	12	47	360	660	59
BT3-16-N	20-Jul-2017		**7.5** [#1]	4.8	7.68	960	500 [#2]	20	87	570	790	490	260	260	10	45	300	410	52
(Duplicate)	20-Jul-2017		**8.3** [#1]	3.9	7.72	1200	370 [#3]	22	81	510	710	600	190	190	11	42	260	370	52
BT3-16-S	20-Jul-2017		**6.9** [#1]	5.8	7.42	830	610 [#2]	19	89	660	1600	440	320	320	9.8	47	350	840	53
BT3-17-N	20-Jul-2017		**9.8** [#1]	7.2	7.69	1200	1600 [#2]	21	120	980	1400	620	840	830	11	65	510	730	52
BT3-17-N-1	20-Jul-2017		3.8	4.4	7.74	400	380 [#3]	17	30	340	290	200	180	190	8.4	14	170	140	49
BT3-17-N-2	20-Jul-2017		**13** [#1]	7.7	7.62	1600	1500 [#2]	29	100	1200	850	840	790	770	15	51	610	440	51
BT3-17-N-3	20-Jul-2017		**7.4** [#1]	7.4	7.70	730	1600 [#2]	17	82	790	1100	420	890	910	9.8	46	450	630	57
BT3-17-N-4	20-Jul-2017		**7.2** [#1]	9.1	7.75	670	1200 [#2]	18	85	940	2000	370	650	660	10	47	520	1100	55
BT3-17-N-5	20-Jul-2017		**7.0** [#1]	7.4	7.65	700	1200 [#2]	16	75	770	1300	410	690	700	9.3	44	450	770	58
BT3-17-S	20-Jul-2017		**10** [#1]	5.6	7.66	1200	870 [#2]	20	160	790	1400	640	450	440	11	80	400	720	51
BT3-18-N	20-Jul-2017		**7.4** [#1]	5.9	7.61	810	830 [#2]	18	100	670	1200	430	440	440	9.4	55	350	650	53
BT3-18-S	20-Jul-2017		**7.9** [#1]	6.7	7.70	870	1100 [#2]	15	120	800	1700	470	600	580	7.8	65	420	890	53
BT3-19-N	20-Jul-2017		**11** [#1]	8.1	7.72	1200	2000 [#2]	21	140	1100	1500	600	1000	1000	11	71	570	770	52

Advisian
WorleyParsons Group

Table 8
Battery #3 Soil Treatment Results
General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Chloride (Calculated) (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
8. Superscript [#2] - Detection limits raised due to dilution to bring analyte within the calibrated range.
9. Superscript [#3] - Detection limits raised due to matrix interference.

Advisian
WorleyParsons Group

Table 9
2017 Mainland Sites Phase II ESA
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
ARB																		
ARB-17-1	21-Sep-2017	1.0 - 1.5m	0.32	2.0	7.52	22	8.3	3.8	4.9	40	73	11	4.2	1.9	2.5	20	37	51
	21-Sep-2017	2.0 - 2.5m	0.58	2.7	7.64	24	49	9.9	20	74	230	9.7	20	4.0	8.2	30	93	41
	21-Sep-2017	3.0 - 3.5m	0.59	5.0	7.73	15	36	12	10	100	150	5.0	12	4.0	3.4	35	50	34
ARB-17-2	21-Sep-2017	0.5 - 1.0m	0.75	3.4	7.54	41	27	4.7	18	100	250	19	13	2.2	8.3	48	120	47
	21-Sep-2017	1.5 - 2.0m	0.68	7.4	7.62	15	14	6.7	4.5	130	210	6.5	5.9	2.8	1.9	54	88	43
	21-Sep-2017	2.5 - 3.0m	1.2	10	7.64	25	100	12	11	240	580	9.8	39	4.5	4.4	93	220	39
ARB-17-3	21-Sep-2017	0.5 - 1.0m	0.75	0.53	7.07	110	36	3.2	30	24	270	61	20	1.9	17	14	160	57
	21-Sep-2017	2.5 - 3.0m	0.58	1.5	7.59	46	49	11	19	47	220	20	21	4.9	8.1	20	95	43
(Duplicate)	21-Sep-2017	2.5 - 3.0m	0.50	1.4	7.59	43	38	11	17	42	180	18	16	4.9	7.2	18	75	43
	21-Sep-2017	4.0 - 4.5m	0.45	1.3	7.63	32	37	11	16	35	110	11	13	3.6	5.5	12	36	34
B-30X																		
B30-17-1	22-Sep-2017	1.0 - 1.5m	0.55	1.1	7.39	67	17	4.6	21	40	150	26	6.4	1.8	8.0	16	59	39
	22-Sep-2017	2.0 - 2.5m	0.63	4.8	7.63	24	24	6.8	7.1	100	190	11	11	3.2	3.3	48	88	47
B30-17-2	22-Sep-2017	1.5 - 2.0m	0.96	1.4	7.56	100	31	9.3	26	63	420	53	16	4.7	13	32	210	51
	22-Sep-2017	2.5 - 3.0m	0.86	3.4	7.71	49	82	9.2	19	110	220	18	30	3.3	6.9	40	81	36
B30-17-3	22-Sep-2017	0.2 - 0.5m	0.76	4.2	7.32	44	33	9.4	15	130	160	19	14	4.0	6.5	55	71	43
	22-Sep-2017	1.0 - 1.5m	0.58	2.5	6.93	52	23	4.2	17	81	66	32	14	2.6	11	50	40	62
	22-Sep-2017	2.0 - 2.5m	0.57	6.4	7.68	14	24	4.8	5.3	110	140	5.5	9.3	1.9	2.1	43	53	39
B30-17-4	23-Sep-2017	0.5 - 1.0m	0.51	1.1	7.44	58	< 5.0	2.5	10	34	200	22	< 1.9	0.95	3.9	13	77	38
	23-Sep-2017	2.5 - 3.0m	0.45	1.5	7.70	22	24	7.1	24	42	94	11	11	3.4	12	20	46	48
	23-Sep-2017	4.0 - 4.5m	0.76	6.3	7.79	17	58	6.8	11	140	270	5.6	20	2.3	3.8	47	94	34

Advisian
WorleyParsons Group

Table 9
2017 Mainland Sites Phase II ESA
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
B30-17-5	23-Sep-2017	0.5 - 1.0m	0.49	2.2	7.12	38	13	6.5	16	64	35	25	8.7	4.4	11	43	24	67
(Duplicate)	23-Sep-2017	0.5 - 1.0m	0.45	1.9	7.21	41	12	5.1	16	56	33	38	11	4.7	14	52	31	93
	23-Sep-2017	1.5 - 2.0m	0.31	1.2	7.58	32	11	5.6	10	30	72	11	3.8	1.9	3.5	10	25	34
B30-17-6	23-Sep-2017	1.0 - 1.5m	0.44	0.91	6.83	50	11	2.9	20	30	45	26	5.7	1.5	10	16	23	51
	23-Sep-2017	1.5 - 2.0m	0.45	1.9	7.39	34	10	3.8	14	51	82	17	5.1	1.9	7.2	26	41	51
B42-X																		
B42-17-1	20-Sep-2017	0.5 - 1.0m	1.6	0.87	7.28	180	350	11	53	52	140	120	230	7.0	35	35	92	67
	20-Sep-2017	1.0 - 1.5m	1.6	1.3	6.91	160	370 [#3]	6.0	48	74	80	100	230	3.6	29	45	48	61
	20-Sep-2017	1.5 - 2.0m	2.0	2.0	6.95	180	550 [#4]	15	52	120	48	160	460	13	44	99	40	85
B42-17-2	20-Sep-2017	0.0 - 0.5m	1.1	1.7	7.22	140	130	9.7	21	82	190	82	79	5.9	13	50	120	60
	20-Sep-2017	0.5 - 1.0m	1.4	2.3	7.11	150	210	6.3	31	120	300	200	280	8.6	42	160	410	140
	20-Sep-2017	1.5 - 2.0m	2.4	5.5	7.27	150	590 [#4]	14	31	280	120	110	440	10	24	210	94	75
B42-17-3	20-Sep-2017	0.5 - 1.0m	1.1	3.7	7.15	72	260	8.2	18	140	77	40	140	4.5	10	75	43	55
	20-Sep-2017	1.0 - 1.5m	1.8	2.1	6.82	160	470 [#4]	9.3	40	110	40	120	360	7.1	31	86	30	76
	20-Sep-2017	1.5 - 2.0m	1.8	1.4	7.22	200	460 [#4]	15	40	83	52	140	330	11	29	60	37	72
B42-17-4	21-Sep-2017	0.5 - 1.0m	0.82	0.46	7.23	100	26	10	34	21	270	73	18	7.3	24	15	190	70
	21-Sep-2017	1.5 - 2.0m	0.35	0.49	7.24	45	15	11	12	14	61	30	9.9	7.0	7.6	9.5	40	66
	21-Sep-2017	2.5 - 3.0m	0.56	0.44	7.24	69	22	11	14	15	170	45	14	7.1	8.9	10	110	66
B42-17-5	21-Sep-2017	0.5 - 1.0m	0.39	0.93	7.50	36	28	8.2	13	26	63	17	13	3.8	6.0	12	29	46
	21-Sep-2017	2.0 - 2.5m	0.42	0.59	6.88	59	20	7.0	13	19	68	45	15	5.3	9.9	14	52	76
	21-Sep-2017	2.5 - 3.0m	0.60	0.55	7.21	79	19	10	14	20	120	59	14	7.7	10	15	88	74
B42-17-6	21-Sep-2017	0.5 - 1.0m	0.70	0.78	7.49	78	100	9.5	22	30	260	39	51	4.7	11	15	130	50
	21-Sep-2017	2.0 - 2.5m	0.77	0.71	7.49	97	23	8.7	19	29	240	63	15	5.6	12	19	160	65

Advisian
WorleyParsons Group

Table 9
2017 Mainland Sites Phase II ESA
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
B42-17-7	21-Sep-2017	0.5 - 1.0m	0.73	0.56	7.05	89	21	7.7	25	23	330	29	7.0	2.5	8.2	7.6	110	33
	21-Sep-2017	1.0 - 1.5m	0.52	0.70	6.76	61	45	4.7	17	24	110	43	32	3.3	12	17	80	71
BT3																		
BT3-17-3	22-Sep-2017	0.5 - 1.0m	3.6	3.7	7.49	370	1100 [#4]	3.6	66	290	250	160	460	1.5	28	120	110	42
(Duplicate)	22-Sep-2017	0.5 - 1.0m	3.4	3.3	7.34	340	960 [#2]	4.7	61	250	220	150	420	410	2.1	26	110	96
	22-Sep-2017	1.5 - 2.0m	0.39	0.43	7.59	47	23	5.4	11	13	110	20	9.9	2.3	4.6	5.4	48	43
	22-Sep-2017	3.0 - 3.5m	2.5	0.16	7.42	510	< 10 [#3]	23	88	15	1400 [#4]	220	< 4.4	10	39	6.4	630	44
BT3-17-2	22-Sep-2017	0.5 - 1.0m	**8.7** [#1]	2.0	7.28	1100	2400 [#4]	2.5	270	290	390	910	2100	2.2	230	250	330	86
	22-Sep-2017	1.5 - 2.0m	1.8	8.4	7.71	69	390 [#3]	3.6	10	280	170	30	160	1.5	4.4	120	72	43
BT3-17-1	22-Sep-2017	0.5 - 1.0m	0.27	0.78	7.60	28	9.0	5.2	7.1	18	68	12	4.0	2.3	3.2	7.9	30	45
	22-Sep-2017	2.0 - 2.5m	0.37	0.48	7.58	41	49	4.6	8.9	13	68	17	21	1.9	3.7	5.5	29	42
	22-Sep-2017	4.0 - 4.5m	1.8	0.20	7.52	240	22 [#3]	19	97	15	590 [#4]	99	9.2	8.0	41	6.2	250	42
E33-X																		
E33-17-1	23-Sep-2017	0.5 - 1.0m	0.53	0.49	7.35	59	33	6.4	21	17	88	44	25	4.8	16	13	66	75
E33-17-2	23-Sep-2017	1.0 - 1.5m	1.2	0.46	7.46	200	39	7.7	23	26	520	110	22	4.4	13	15	300	57
	23-Sep-2017	3.0 - 3.5m	2.0	0.36	7.52	250	560 [#4]	11	60	24	250	120	270	5.4	28	12	120	47
(Duplicate)	23-Sep-2017	3.0 - 3.5m	2.0	0.32	7.54	240	560 [#4]	12	60	22	250	110	250	5.3	27	9.9	110	45
	23-Sep-2017	6.0 - 6.5m	0.76	0.78	7.58	92	9.2	7.8	18	31	110	35	3.5	3.0	6.9	12	43	38
	23-Sep-2017	7.5 - 9.0m	0.83	5.4	7.70	30	98	17	6.3	120	260	14	45	7.8	2.9	58	120	46
E33-17-3	24-Sep-2017	1.0 - 1.5m	1.1	0.33	7.67	140	140	5.0	49	18	350	74	73	2.6	25	9.3	180	51
	24-Sep-2017	5.0 - 5.5m	0.73	0.89	7.71	74	86	9.6	21	34	58	36	42	4.7	10	16	28	49
	24-Sep-2017	6.0 - 6.5m	0.31	< 0.10	8.00 [#2]	< 1.5	20	5.9	< 1.0	68	64	< 0.64	8.7	2.5	< 0.43	29	27	43

Advisian
WorleyParsons Group

Table 9
2017 Mainland Sites Phase II ESA
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---
E33-17-4	24-Sep-2017	2.5 - 3.0m	0.77	0.51	7.70	93	130	6.1	19	21	120	38	55	2.5	7.9	8.5	49	41
	24-Sep-2017	3.9 - 4.2m	1.2	0.31	7.81	160	61	9.8	42	17	120	66	25	4.0	17	6.9	47	40
(Duplicate)	24-Sep-2017	3.9 - 4.2m	1.2	0.27	7.56	160	56	10	42	15	110	67	23	4.2	17	6.1	46	42
	24-Sep-2017	6.0 - 6.5m	0.56	12 [#2]	**8.12** [#2]	2.4	78	13	2.8	120	110	1.1	37	6.0	1.3	56	50	47
E33-17-5	24-Sep-2017	2.5 - 3.0m	1.1	2.2	7.51	100	97	11	18	92	120	49	47	5.5	8.5	44	60	48
	24-Sep-2017	4.0 - 4.5m	1.2	0.79	7.63	130	120	12	44	41	100	56	51	5.1	20	18	44	44
	24-Sep-2017	4.5 - 5.0m	0.56	9.2	7.64	5.0	84	12	2.8	100	120	2.0	34	4.8	1.2	42	50	41
E33-17-6	24-Sep-2017	3.5 - 4.0m	0.84	0.41	7.53	110	24	9.4	29	19	130	59	13	5.1	16	10	70	54
	24-Sep-2017	5.0 - 5.5m	0.74	0.90	7.55	69	100	8.0	24	34	64	35	52	4.1	12	17	32	51
	24-Sep-2017	6.0 - 6.5m	0.27	5.4	7.97	2.3	37	13	2.7	51	51	1.2	20	7.1	1.5	28	28	55

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)
8. Superscript [#3] - Detection limits raised due to matrix interference.
9. Superscript [#4] - Detection limits raised due to dilution to bring analyte within the calibrated range.

Advisian
WorleyParsons Group

Table 10
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	General: % Moisture (%)	Petroleum Hydrocarbons (PHCs): Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Reached Baseline at C_{50} (none)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]			---	**110**	**330**	**430**	**230**	---	---	---	---	---	---
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]			---	---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---
CCME CSQG, Industrial, Fine, Sub-Surface, GW Check and Indoor Air Paths Excluded [#6]			---	**620**	**660**	**860**	**460**	---	---	---	---	---	---
CCME PHC in Soil, Industrial, Fine, Sub-Surface, Potable GW Excluded [#7]			---	---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---
ARB													
ARB-17-1	21-Sep-2017	1.0 - 1.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	21-Sep-2017	2.0 - 2.5m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	21-Sep-2017	3.0 - 3.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	12	12	89	< 50	---	YES
ARB-17-2	21-Sep-2017	0.5 - 1.0m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	77	< 50	---	YES
	21-Sep-2017	1.5 - 2.0m	24	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	21-Sep-2017	2.5 - 3.0m	22	< 0.0050	< 0.020	< 0.010	< 0.040	21	< 10	51	< 50	---	YES
ARB-17-3	21-Sep-2017	0.5 - 1.0m	27	< 0.0050	1.7	< 0.010	< 0.040	13	39	270	84	---	YES
	21-Sep-2017	2.5 - 3.0m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
(Duplicate)	21-Sep-2017	2.5 - 3.0m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	56	< 50	---	YES
	21-Sep-2017	4.0 - 4.5m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	10	65	< 50	---	YES
B-30X													
B30-17-1	22-Sep-2017	1.0 - 1.5m	15	< 0.0050	< 0.020	< 0.010	< 0.040	14	52	100	< 50	---	YES
	22-Sep-2017	2.0 - 2.5m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	23	87	< 50	---	YES
B30-17-2	22-Sep-2017	1.5 - 2.0m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	53	< 50	---	YES
	22-Sep-2017	2.5 - 3.0m	17	< 0.0050	< 0.020	< 0.010	< 0.040	10	12	75	< 50	---	YES
B30-17-3	22-Sep-2017	0.2 - 0.5m	17	< 0.0050	< 0.020	0.049	0.14	18	72	210	56	---	YES
	22-Sep-2017	1.0 - 1.5m	22	< 0.0050	0.050	0.081	< 0.040	12	24	190	< 50	---	YES
	22-Sep-2017	2.0 - 2.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	11	63	< 50	---	YES
B30-17-4	23-Sep-2017	0.5 - 1.0m	17	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	88	< 50	---	YES
	23-Sep-2017	2.5 - 3.0m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	60	< 50	---	YES
	23-Sep-2017	4.0 - 4.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	14	140	56	---	YES
B30-17-5	23-Sep-2017	0.5 - 1.0m	21	0.010	0.032	0.075	0.10 [#3]	35	19	1000	700	---	YES
(Duplicate)	23-Sep-2017	0.5 - 1.0m	37	0.021	0.070	0.31	0.25 [#3]	94	64	**5800** [#2]	4100	**16000** [#2]	NO
	23-Sep-2017	1.5 - 2.0m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	58	< 50	---	YES
B30-17-6	23-Sep-2017	1.0 - 1.5m	18	< 0.0050	< 0.020	0.031	< 0.040	< 10	< 10	68	< 50	---	YES
	23-Sep-2017	1.5 - 2.0m	30	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	11	97	< 50	---	YES
B42-X													
B42-17-1	20-Sep-2017	0.5 - 1.0m	26	0.012	< 0.020	< 0.010	< 0.040	< 10	20	850	660	2000	NO
	20-Sep-2017	1.0 - 1.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	120	**5600** [#2]	4700	**14000** [#2]	NO
	20-Sep-2017	1.5 - 2.0m	34	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	17	150	< 50	---	YES
B42-17-2	20-Sep-2017	0.0 - 0.5m	26	0.041 [#4]	0.050 [#5]	0.090 [#4]	0.55	**1200** [#2]	**9700** [#2]	**23000** [#2]	**8200** [#2]	**35000** [#2]	NO
	20-Sep-2017	0.5 - 1.0m	41	1.7	< 0.020	1.6	2.7	88	210	1600	970	2700	NO
	20-Sep-2017	1.5 - 2.0m	30	0.040	0.033	0.038	0.10	< 10	76	320	95	---	YES
B42-17-3	20-Sep-2017	0.5 - 1.0m	15	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	40	450	240	---	YES
	20-Sep-2017	1.0 - 1.5m	30	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	13	200	< 50	---	YES
	20-Sep-2017	1.5 - 2.0m	31	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	15	86	< 50	---	YES
B42-17-4	21-Sep-2017	0.5 - 1.0m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	55	640	370	1100	NO
	21-Sep-2017	1.5 - 2.0m	27	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	23	170	< 50	---	YES
(Duplicate)	21-Sep-2017	1.5 - 2.0m	26	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	20	160	< 50	---	YES
	21-Sep-2017	2.5 - 3.0m	31	< 0.0050	0.19	< 0.010	< 0.040	< 10	12	94	< 50	---	YES
B42-17-5	21-Sep-2017	0.5 - 1.0m	10	0.014	0.11	0.030	0.31	89	**500** [#2]	690	100	---	YES
	21-Sep-2017	2.0 - 2.5m	30	2.3	0.64	3.7	29	**4000** [#2]	**17000** [#2]	**4600** [#2]	200	---	YES
(Duplicate)	21-Sep-2017	2.0 - 2.5m	26	2.1	0.26	3.5	7.6	**2100** [#2]	**7100** [#2]	1900	89	---	YES
	21-Sep-2017	2.5 - 3.0m	32	1.3	0.042	1.2	2.4	130	120	190	53	---	YES
B42-17-6	21-Sep-2017	0.5 - 1.0m	15	0.012 [#3]	< 0.020	< 0.010	0.056 [#3]	110	82	700	330	---	YES
	21-Sep-2017	2.0 - 2.5m	25	< 0.0050	< 0.020	< 0.010	< 0.040	10	20	110	< 50	---	YES
B42-17-7	21-Sep-2017	0.5 - 1.0m	15	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	61	530	260	---	YES
	21-Sep-2017	1.0 - 1.5m	26	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	120	< 50	---	YES
BT3													
BT3-17-3	22-Sep-2017	0.5 - 1.0m	21	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	70	< 50	---	YES
(Duplicate)	22-Sep-2017	0.5 - 1.0m	23	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	16	100	< 50	---	YES
	22-Sep-2017	1.5 - 2.0m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	22-Sep-2017	3.0 - 3.5m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	24	250	120	---	YES
BT3-17-2	22-Sep-2017	0.5 - 1.0m	9.8	0.014	0.089	0.027	0.16	< 10	**440** [#2]	**7100** [#2]	4500	**16000** [#2]	NO
	22-Sep-2017	1.5 - 2.0m	16	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BT3-17-1	22-Sep-2017	0.5 - 1.0m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	22-Sep-2017	2.0 - 2.5m	19	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	51	< 50	---	YES
	22-Sep-2017	4.0 - 4.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	14	150	70	---	YES
E33-X													
E33-17-1	23-Sep-2017	0.5 - 1.0m	29	0.025	< 0.020	0.031	< 0.040	< 10	29	470	180	---	YES
	23-Sep-2017	1.5 - 2.0m	20	0.077	< 0.020	0.18	< 0.040	12	31	130	55	---	YES
E33-17-2	23-Sep-2017	1.0 - 1.5m	21	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	16	74	< 50	---	YES
	23-Sep-2017	3.0 - 3.5m	13	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	43	140	< 50	---	YES
(Duplicate)	23-Sep-2017	3.0 - 3.5m	16	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	27	95	< 50	---	YES
	23-Sep-2017	6.0 - 6.5m	16	2.0	0.056 [#3]	2.4	19	**2100** [#7]	**6900** [#7]	**12000** [#7]	3800	**13000** [#7]	NO
	23-Sep-2017	7.5 - 9.0m	7.0	0.024	0.028	0.066	0.48	80	390	730	220	---	YES

Advisian
WorleyParsons Group

Table 10
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	General: % Moisture (%)	Petroleum Hydrocarbons (PHCs): Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Reached Baseline at C_{50} (none)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]			---	**110**	**330**	**430**	**230**	---	---	---	---	---	---
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]			---	---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---
CCME CSQG, Industrial, Fine, Sub-Surface, GW Check and Indoor Air Paths Excluded [#6]			---	**620**	**660**	**860**	**460**	---	---	---	---	---	---
CCME PHC in Soil, Industrial, Fine, Sub-Surface, Potable GW Excluded [#7]			---	---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---
E33-17-3	24-Sep-2017	1.0 - 1.5m	19	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	26	130	< 50	---	YES
	24-Sep-2017	5.0 - 5.5m	21	0.0094	< 0.020	< 0.010	< 0.040	11	42	150	50	---	YES
	24-Sep-2017	6.0 - 6.5m	7.9	< 0.0050	< 0.020	< 0.010	< 0.040	17	97	290	100	---	YES
E33-17-4	24-Sep-2017	2.5 - 3.0m	6.5	< 0.0050	< 0.020	< 0.010	< 0.040	29	150	330	110	---	YES
	24-Sep-2017	3.9 - 4.2m	13	< 0.0050	< 0.020	0.024 [#3]	< 0.040	490	**2200** [#7]	4500	1600	---	YES
(Duplicate)	24-Sep-2017	3.9 - 4.2m	13	< 0.0050	< 0.020	0.013 [#3]	< 0.040	250	**1700** [#7]	3400	1200	---	YES
	24-Sep-2017	6.0 - 6.5m	9.6	< 0.0050	< 0.020	0.032	0.16	33	100	170	53	---	YES
E33-17-5	24-Sep-2017	2.5 - 3.0m	22	< 0.0050	< 0.020	< 0.010	< 0.040	47	69	340	140	---	YES
	24-Sep-2017	4.0 - 4.5m	14	< 0.0050	< 0.020	0.014	< 0.040	100	600	1400	490	---	YES
	24-Sep-2017	4.5 - 5.0m	9.2	< 0.0050	< 0.020	< 0.010	< 0.040	35	200	390	120	---	YES
E33-17-6	24-Sep-2017	3.5 - 4.0m	23	< 0.0050	< 0.020	< 0.010	< 0.040	11	38	200	67	---	YES
	24-Sep-2017	5.0 - 5.5m	19	0.0099 [#3]	0.028 [#3]	0.030 [#3]	1.9 [#3]	740	**3800** [#7]	**6900** [#7]	2400	---	YES
	24-Sep-2017	6.0 - 6.5m	9.5	< 0.0050	< 0.020	< 0.010	< 0.040	23	100	200	56	---	YES

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Surface Soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
8. Superscript [#3] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
9. Superscript [#4] - Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.
10. Superscript [#5] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.
11. Superscript [#6] denotes values exceeding
    (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
12. Superscript [#7] denotes values exceeding
    (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 11
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Boron - Hot Water Soluble (mg/kg)	Boron - Saturated Paste (mg/L)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			---	40	12	2000	8	---	---	---	22	87	1.4	300	91	600	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			---	40	12	2000	8	---	---	---	22	87	1.4	300	91	600	40	89	2.9	40	1	300	300	130	320
ARB																									
ARB-17-1	21-Sep-2017	1.0 - 1.5m	6900	0.56	11	280	0.46	5.5	0.56	0.19	0.51	15	< 0.080	9.2	21	9.9	2.2	28	0.68	< 0.20	0.14	< 1.0	1.0	24	89
	21-Sep-2017	2.0 - 2.5m	7600	0.68	12 [#1]	320	0.49	6.6	1.2	0.64	0.62	17	< 0.080	11	25	11	1.9	32	0.57	< 0.20	0.17	< 1.0	1.0	26	100
	21-Sep-2017	3.0 - 3.5m	8600	0.60	11	280	0.49	7.1	1.2	0.58	0.47	20	< 0.080	11	22	11	2.4	33	0.60	< 0.20	0.18	< 1.0	0.95	29	98
ARB-17-2	21-Sep-2017	0.5 - 1.0m	6900	0.54	7.5	270	0.44	4.6	0.37	0.10	0.44	15	< 0.080	8.4	20	9.5	2.0	26	0.60	< 0.20	0.15	< 1.0	0.84	23	83
	21-Sep-2017	1.5 - 2.0m	7400	0.56	8.7	270	0.46	4.7	0.5	0.18	0.49	16	< 0.080	9.2	21	9.8	2.5	28	0.52	< 0.20	0.17	< 1.0	0.88	25	91
	21-Sep-2017	2.5 - 3.0m	7700	0.57	11	260	0.46	6.4	1.3	0.70	0.54	17	< 0.080	9.7	22	10	2.1	28	0.64	< 0.20	0.17	< 1.0	0.92	26	94
ARB-17-3	21-Sep-2017	0.5 - 1.0m	6600	< 0.50	11	200	0.42	3.7	0.15	< 0.10	0.42	16	< 0.080	7.7	15	9.2	2.0	25	< 0.50	< 0.20	0.14	< 1.0	1.3	28	70
	21-Sep-2017	2.5 - 3.0m	7100	0.64	9.5	320	0.46	4.9	0.62	0.29	0.57	17	< 0.080	9.5	22	11	2.2	29	0.65	< 0.20	0.18	< 1.0	0.92	25	97
(Duplicate)	21-Sep-2017	2.5 - 3.0m	6800	0.63	9.3	310	0.50	4.7	0.61	0.27	0.59	16	< 0.080	9.5	21	11	2.0	29	0.62	< 0.20	0.16	< 1.0	0.94	24	94
	21-Sep-2017	4.0 - 4.5m	6700	0.60	11	350	< 0.40	4.7	0.52	0.39	0.53	20	< 0.080	11	24	11	1.6	34	< 0.50	< 0.20	0.17	< 1.0	0.93	31	110
B-30X																									
B30-17-1	22-Sep-2017	1.0 - 1.5m	6800	0.60	7.7	260	0.43	4.2	0.21	< 0.10	0.45	15	< 0.080	8.2	20	8.9	3.9	26	0.66	< 0.20	0.31	< 1.0	1.3	27	74
	22-Sep-2017	2.0 - 2.5m	7400	0.57	9.8	260	0.46	6.9	0.91	0.39	0.49	17	< 0.080	9.8	22	9.9	2.3	29	< 0.50	< 0.20	0.18	< 1.0	0.91	25	92
B30-17-2	22-Sep-2017	1.5 - 2.0m	8700	0.62	10	320	0.50	5.3	0.34	0.11	0.60	20	< 0.080	11	25	12	2.6	34	0.67	< 0.20	0.20	< 1.0	1.1	29	110
	22-Sep-2017	2.5 - 3.0m	9500	0.56	12 [#1]	240	0.46	4.8	0.48	0.29	0.41	22	< 0.080	12	22	10	1.8	36	< 0.50	< 0.20	0.19	< 1.0	0.93	30	97
B30-17-3	22-Sep-2017	0.2 - 0.5m	10000	0.67	12 [#1]	290	0.54	6.4	0.8	0.34	0.41	23	< 0.080	11	27	11	3.4	36	0.63	< 0.20	0.24	< 1.0	0.89	34	100
	22-Sep-2017	1.0 - 1.5m	7800	< 0.50	6.5	290	0.51	4.9	0.84	0.13	0.55	15	< 0.080	7.1	16	8.1	1.4	21	0.55	< 0.20	< 0.10	< 1.0	1.4	26	76
	22-Sep-2017	2.0 - 2.5m	8500	0.63	10	310	0.50	5.7	0.48	0.21	0.59	19	< 0.080	11	24	12	2.3	32	0.53	< 0.20	0.19	< 1.0	0.96	27	100
B30-17-4	23-Sep-2017	0.5 - 1.0m	5200	< 0.50	7.1	220	< 0.40	3.9	0.39	0.12	0.41	15	< 0.080	7.1	16	8.1	1.6	23	0.51	< 0.20	0.12	< 1.0	0.96	21	69
	23-Sep-2017	2.5 - 3.0m	7200	0.66	9.4	330	0.45	7.5	1.4	0.54	0.60	17	< 0.080	9.7	22	11	1.9	30	0.69	< 0.20	0.18	< 1.0	0.94	26	97
	23-Sep-2017	4.0 - 4.5m	8400	< 0.50	14 [#2]	230	0.49	6.2	0.88	0.62	0.36	21	< 0.080	11	20	11	2.7	33	< 0.50	< 0.20	0.16	< 1.0	0.63	28	91
B30-17-5	23-Sep-2017	0.5 - 1.0m	7500	< 0.50	6.4	290	0.49	4.8	0.49	< 0.10	0.74	16	< 0.080	7.3	17	8.9	1.5	22	0.59	< 0.20	0.12	< 1.0	1.2	26	76
(Duplicate)	23-Sep-2017	0.5 - 1.0m	6900	< 0.50	5.5	310	0.51	4.7	0.23	< 0.10	0.89	14	< 0.080	6.3	16	8.6	1.4	20	0.68	< 0.20	< 0.10	< 1.0	1.8	24	69
	23-Sep-2017	1.5 - 2.0m	5900	0.61	8.2	210	0.43	3.4	0.18	< 0.10	0.52	15	< 0.080	8.7	19	9.5	2.3	26	0.75	< 0.20	0.20	< 1.0	0.84	24	81
B30-17-6	23-Sep-2017	1.0 - 1.5m	8000	< 0.50	6.6	350	0.55	4.3	0.35	< 0.10	0.42	18	< 0.080	8.0	22	9.7	1.6	26	0.62	< 0.20	< 0.10	< 1.0	0.88	29	75
	23-Sep-2017	1.5 - 2.0m	8600	0.69	10	300	0.55	8.1	1.1	0.22	0.67	19	< 0.080	11	23	11	2.1	33	1.1	< 0.20	0.18	< 1.0	1.7	28	100
B42-X																									
B42-17-1	20-Sep-2017	0.5 - 1.0m	7100	0.51	7.7	300	0.47	6.0	0.6	< 0.10	0.49	18	< 0.080	7.9	16	10	1.9	26	0.57	0.22	0.14	< 1.0	0.98	26	79
	20-Sep-2017	1.0 - 1.5m	7900	< 0.50	9.1	250	0.53	4.2	0.48	< 0.10	0.35	19	< 0.080	8.1	16	9.0	1.7	34	0.53	< 0.20	0.12	< 1.0	0.78	51	71
	20-Sep-2017	1.5 - 2.0m	9600	0.71	7.2	220	0.68	6.3	1	0.18	0.68	22	< 0.080	11	28	12	1.8	37	0.83	< 0.20	0.19	< 1.0	0.91	32	110
B42-17-2	20-Sep-2017	0.0 - 0.5m	5900	0.93	9.4	330	0.48	4.9	0.43	< 0.10	0.60	25	< 0.080	7.8	21	15	13	37	1.2	< 0.20	0.78	< 1.0	1.8	35	87
	20-Sep-2017	0.5 - 1.0m	7000	0.53	6.5	300	0.52	6.4	0.2	< 0.10	0.53	13	< 0.080	7.3	16	12	3.0	22	0.65	0.25	0.19	< 1.0	1.1	27	71
	20-Sep-2017	1.5 - 2.0m	8400	0.64	7.7	280	0.56	6.6	1.2	0.20	0.60	17	< 0.080	9.9	23	10	2.0	30	0.71	< 0.20	0.18	< 1.0	1.0	28	100

Advisian
WorleyParsons Group

Table 11
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Boron - Hot Water Soluble (mg/kg)	Boron - Saturated Paste (mg/L)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			---	40	12	2000	8	---	---	---	22	87	1.4	300	91	600	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			---	40	12	2000	8	---	---	---	22	87	1.4	300	91	600	40	89	2.9	40	1	300	300	130	320
B42-17-3	20-Sep-2017	0.5 - 1.0m	8900	0.57	14 [#1]	250	0.50	5.7	0.4	< 0.10	0.31	36	< 0.080	11	23	10	2.7	40	0.57	< 0.20	0.30	< 1.0	0.87	29	94
	20-Sep-2017	1.0 - 1.5m	10000	0.65	7.2	220	0.68	4.8	0.51	< 0.10	0.66	23	< 0.080	11	25	12	1.4	35	0.83	< 0.20	0.15	< 1.0	1.1	33	100
	20-Sep-2017	1.5 - 2.0m	7400	0.63	8.1	250	0.54	4.7	0.65	0.12	0.52	16	< 0.080	9.1	22	11	2.0	29	0.71	< 0.20	0.19	< 1.0	0.89	25	92
B42-17-4	21-Sep-2017	0.5 - 1.0m	8100	< 0.50	11	240	0.46	6.8	0.79	0.11	0.41	18	< 0.080	9.3	19	11	1.9	29	0.54	< 0.20	0.21	< 1.0	0.92	27	86
	21-Sep-2017	1.5 - 2.0m	9300	0.68	8.7	190	0.65	5.9	0.81	0.12	0.72	19	< 0.080	11	24	11	2.3	34	0.87	< 0.20	0.20	< 1.0	1.0	30	100
(Duplicate)	21-Sep-2017	1.5 - 2.0m	8600	0.67	8.1	190	0.59	4.7	0.88	---	0.56	18	< 0.080	11	24	11	2.1	32	0.77	< 0.20	0.20	< 1.0	0.91	28	100
	21-Sep-2017	2.5 - 3.0m	11000	0.75	9.4	320	0.71	6.7	0.99	0.17	0.69	22	< 0.080	13	26	13	2.3	39	0.86	< 0.20	0.23	< 1.0	1.2	35	130
B42-17-5	21-Sep-2017	0.5 - 1.0m	8800	0.64	16 [#1]	230	0.47	5.2	0.39	< 0.10	0.25	22	< 0.080	11	25	10	4.5	36	0.57	< 0.20	0.41	< 1.0	0.88	30	98
	21-Sep-2017	2.0 - 2.5m	9800	0.60	8.0	210	0.65	5.0	0.53	0.12	0.70	20	< 0.080	11	25	12	2.2	34	0.83	< 0.20	0.22	< 1.0	1.1	31	99
(Duplicate)	21-Sep-2017	2.0 - 2.5m	8500	0.58	7.2	200	0.59	4.2	0.83	---	0.62	17	< 0.080	9.6	23	11	1.7	31	0.77	< 0.20	0.17	< 1.0	0.89	27	93
	21-Sep-2017	2.5 - 3.0m	8800	0.70	7.6	330	0.62	6.9	1.3	0.21	0.70	18	< 0.080	9.4	25	11	2.3	31	0.78	< 0.20	0.21	< 1.0	1.1	30	110
B42-17-6	21-Sep-2017	0.5 - 1.0m	8700	0.68	15 [#1]	260	0.46	5.1	0.25	< 0.10	0.29	23	< 0.080	11	25	11	7.0	37	0.89	< 0.20	0.62	< 1.0	1.1	32	98
	21-Sep-2017	2.0 - 2.5m	8500	0.59	7.0	260	0.53	5.1	0.68	< 0.10	0.55	18	< 0.080	10	23	11	1.9	31	0.70	< 0.20	0.16	< 1.0	0.93	27	98
B42-17-7	21-Sep-2017	0.5 - 1.0m	2400	3.3	21 [#1]	180	< 0.40	3.3	0.23	< 0.10	0.24	110 [#1]	< 0.080	4.1	23	16	78 [#1]	79	4.4 [#1]	0.29	5.1 [#1]	< 1.0	4.4	74	42
	21-Sep-2017	1.0 - 1.5m	10000	0.57	5.5	260	0.76	3.2	0.75	0.10	0.47	19	< 0.080	7.5	19	12	1.4	27	0.67	< 0.20	0.15	< 1.0	1.1	32	80
BT3																									
BT3-17-3	22-Sep-2017	0.5 - 1.0m	7600	0.52	8.7	300	0.51	4.2	0.11	< 0.10	0.32	17	< 0.080	8.4	21	9.2	1.4	29	0.57	< 0.20	0.12	< 1.0	0.80	27	72
(Duplicate)	22-Sep-2017	0.5 - 1.0m	7500	0.54	8.2	280	0.48	4.1	< 0.10	< 0.10	0.3	18	< 0.080	8.1	21	8.9	1.5	28	0.5	< 0.20	0.13	< 1.0	0.75	27	75
	22-Sep-2017	1.5 - 2.0m	7500	< 0.50	9.7	270	0.41	3.8	0.11	< 0.10	0.45	17	< 0.080	9.5	21	9.9	1.9	29	< 0.50	< 0.20	0.16	< 1.0	0.91	26	89
	22-Sep-2017	3.0 - 3.5m	7900	0.56	8.5	140	0.43	4.0	0.3	0.16	0.47	17	< 0.080	10	21	9.3	1.7	29	0.50	< 0.20	0.14	< 1.0	0.87	26	92
BT3-17-2	22-Sep-2017	0.5 - 1.0m	8300	0.58	9.0	480	0.58	6.5	0.66	< 0.10	0.62	15	< 0.080	7.5	16	10	0.93	26	0.82	< 0.20	< 0.10	< 1.0	1.4	31	76
	22-Sep-2017	1.5 - 2.0m	8400	0.52	11	270	0.49	4.1	0.18	< 0.10	0.41	20	< 0.080	9.8	20	9.9	1.7	31	< 0.50	< 0.20	0.16	< 1.0	0.81	29	89
BT3-17-1	22-Sep-2017	0.5 - 1.0m	8600	0.59	9.9	340	0.54	4.2	0.14	< 0.10	0.50	19	< 0.080	10	23	11	2.1	31	0.67	< 0.20	0.16	< 1.0	0.86	29	95
	22-Sep-2017	2.0 - 2.5m	7600	0.62	10	310	0.48	4.1	0.11	< 0.10	0.55	17	< 0.080	10	22	10	2.1	30	< 0.50	< 0.20	0.18	< 1.0	0.88	26	96
	22-Sep-2017	4.0 - 4.5m	8000	< 0.50	11	180	0.43	3.6	0.19	0.13	0.41	17	< 0.080	10	20	9.3	1.6	30	< 0.50	< 0.20	0.14	< 1.0	0.82	26	90
E33-X																									
E33-17-1	23-Sep-2017	0.5 - 1.0m	8200	0.52	7.1	320	0.58	5.2	0.32	< 0.10	0.54	17	< 0.080	9.7	19	11	1.9	29	0.56	< 0.20	0.19	< 1.0	0.72	25	98
	23-Sep-2017	1.5 - 2.0m	7500	< 0.50	7.4	280	0.53	4.3	0.34	---	0.36	16	< 0.080	9.6	17	9.8	1.8	28	0.63	< 0.20	0.17	< 1.0	0.80	22	79
E33-17-2	23-Sep-2017	1.0 - 1.5m	6400	< 0.50	6.8	340	0.45	4.3	< 0.10	< 0.10	0.39	15	< 0.080	8.1	15	9.2	1.7	26	0.56	< 0.20	0.19	< 1.0	0.77	20	75
	23-Sep-2017	3.0 - 3.5m	8000	0.52	9.9	300	0.62	3.7	0.21	< 0.10	0.47	18	< 0.080	11	20	14	3.8	37	0.56	< 0.20	0.25	< 1.0	0.88	28	96
(Duplicate)	23-Sep-2017	3.0 - 3.5m	7900	0.52	9.4	300	0.60	4.1	0.24	< 0.10	0.46	18	< 0.080	11	19	13	4.0	35	0.59	< 0.20	0.27	< 1.0	0.87	27	93
	23-Sep-2017	6.0 - 6.5m	7300	0.65	9.3	180	0.50	3.7	0.31	0.16	0.55	16	< 0.080	10	17	10	3.4	36	0.69	< 0.20	0.27	< 1.0	0.99	31	88
	23-Sep-2017	7.5 - 9.0m	12000	< 0.50	12 [#2]	170	0.50	5.5	0.76	0.42	0.20	24	< 0.080	12	19	8.0	1.2	39	< 0.50	< 0.20	0.11	< 1.0	0.54	36	98
E33-17-3	24-Sep-2017	1.0 - 1.5m	7600	< 0.50	7.6	260	0.63	4.2	0.13	< 0.10	0.32	17	< 0.080	11	17	12	2.3	32	< 0.50	< 0.20	0.22	< 1.0	0.77	21	79
	24-Sep-2017	5.0 - 5.5m	6600	0.54	7.3	240	0.41	4.4	0.54	0.27	0.47	14	< 0.080	8.9	18	9.3	2.6	27	0.58	< 0.20	0.16	< 1.0	0.81	23	80
	24-Sep-2017	6.0 - 6.5m	14000	< 0.50	11	400	0.77	8.5	1.6	0.79	< 0.050	29	< 0.080	17	37	12	< 0.40	51	< 0.50	< 0.20	< 0.10	< 1.0	0.38	36	140

Advisian
WorleyParsons Group

Table 11
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Boron - Hot Water Soluble (mg/kg)	Boron - Saturated Paste (mg/L)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			---	40	12	2000	8	---	---	---	22	87	1.4	300	91	600	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			---	40	12	2000	8	---	---	---	22	87	1.4	300	91	600	40	89	2.9	40	1	300	300	130	320
E33-17-4	24-Sep-2017	2.5 - 3.0m	6600	0.55	11	220	0.51	4.1	0.12	< 0.10	0.56	18	< 0.080	8.9	22	13	5.6	35	0.83	< 0.20	0.25	< 1.0	1.1	32	90
	24-Sep-2017	3.9 - 4.2m	7000	0.73	**18 [#2]**	180	0.52	4.1	0.31	0.13	0.60	16	< 0.080	9.0	18	10	5.4	35	0.91	< 0.20	0.23	< 1.0	1.3	36	87
(Duplicate)	24-Sep-2017	3.9 - 4.2m	7800	0.60	**15 [#2]**	160	0.50	3.9	0.25	0.14	0.52	18	< 0.080	9.0	16	9.4	4.7	33	0.73	< 0.20	0.19	< 1.0	1.0	37	86
	24-Sep-2017	6.0 - 6.5m	14000	< 0.50	**14 [#2]**	420	0.83	10	1.8	1.1	0.056	30	< 0.080	17	44	14	< 0.40	54	< 0.50	< 0.20	< 0.10	< 1.0	0.44	38	150
E33-17-5	24-Sep-2017	2.5 - 3.0m	9100	< 0.50	8.9	350	0.63	4.8	0.56	0.21	0.34	19	< 0.080	13	19	12	3.9	35	0.52	< 0.20	0.23	2.9	1.0	26	90
	24-Sep-2017	4.0 - 4.5m	6900	0.57	8.4	230	0.43	4.7	0.52	0.24	0.51	19	< 0.080	10	19	9.7	4.8	34	0.69	< 0.20	0.20	< 1.0	0.98	29	83
	24-Sep-2017	4.5 - 5.0m	21000	< 0.50	**34 [#2]**	170	0.81	8.6	0.89	0.58	< 0.050	34	< 0.080	18	35	10	< 0.40	57	< 0.50	< 0.20	0.10	< 1.0	0.44	51	140
E33-17-6	24-Sep-2017	3.5 - 4.0m	7500	0.50	8.8	230	0.48	4.3	0.62	0.20	0.45	16	< 0.080	11	19	10	3.0	32	0.63	< 0.20	0.20	< 1.0	0.82	24	87
	24-Sep-2017	5.0 - 5.5m	8600	0.52	8.4	270	0.58	5.0	0.66	0.30	0.42	18	< 0.080	11	18	11	3.0	34	0.57	< 0.20	0.23	< 1.0	0.84	27	87
	24-Sep-2017	6.0 - 6.5m	15000	< 0.50	**16 [#2]**	380	0.75	9.6	2.2	0.73	0.053	32	< 0.080	19	45	12	< 0.40	57	< 0.50	< 0.20	< 0.10	< 1.0	0.39	38	160

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 12
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
CCME Industrial Fine Sub-Surface [#3]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
BT3																															
BT3-17-1	22-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0056	0.012	0.012	0.012	0.023	< 0.0050	0.029	0.027	< 0.0050	0.0097	< 0.0050	0.0068	< 0.0050	0.0062	0.056	0.029	0.20	0.018	0.0083	0.046	0.022	0.012	< 0.010
	22-Sep-2017	2.0 - 2.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0085	0.0085	0.021	< 0.0050	0.025	0.023	< 0.0050	0.0097	< 0.0050	0.0074	< 0.0050	0.0054	0.051	0.027	0.18	0.013	0.0055	0.040	0.020	0.011	< 0.010
	22-Sep-2017	4.0 - 4.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0065	0.013	0.013	0.013	0.022	< 0.0050	0.028	0.032	< 0.0050	0.012	< 0.0050	0.0096	< 0.0050	0.0067	0.056	0.029	0.20	0.034	0.013 [#2]	0.074	**0.048 [#2]**	0.017	< 0.010
BT3-17-2	22-Sep-2017	0.5 - 1.0m	0.0067 [#2]	0.027 [#2]	< 0.010	0.012	0.027 [#2]	0.037	0.11	0.10	0.10	0.13	< 0.0050	0.31	0.13	0.0088	0.23	0.042	0.090	0.023 [#2]	0.056	0.34	0.18	**1.4 [#1]**	0.35	**0.065 [#1]**	0.0079	**1.5 [#1]**	0.25	0.040
	22-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0076	0.0076	0.016	< 0.0050	0.019	0.016	< 0.0050	0.0083	< 0.0050	0.0053	< 0.0050	< 0.0050	0.044	0.023	0.15	0.0092	< 0.0050	0.025	0.019	0.0080	< 0.010
BT3-17-3	22-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0070	0.0070	0.011	< 0.0050	0.014	0.013	< 0.0050	0.0052	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.037	0.019	0.11	0.0077	< 0.0050	0.016	0.010	< 0.0050	< 0.010
(Duplicate)	22-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0070	0.0070	0.011	< 0.0050	0.015	0.014	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.037	0.019	0.11	0.030	0.0074	0.017	0.014	0.0053	< 0.010
	22-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0077	0.0077	0.017	< 0.0050	0.021	0.017	< 0.0050	0.0072	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.045	0.024	0.15	0.0089	< 0.0050	0.025	0.015	0.0076	< 0.010
	22-Sep-2017	3.0 - 3.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	0.0061	0.0072	0.014	0.014	0.014	0.023	< 0.0050	0.030	0.027	< 0.0050	0.014	< 0.0050	0.010	0.0078	0.0068	0.060	0.031	0.22	0.038	0.012	0.091	**0.063 [#2]**	0.022	< 0.010

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Benzo(a)Pyrene Total Potency Equivalent (CCME)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits
7. Benzo(a)Pyrene Total Potency Equivalent (ESRD)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits
8. Calculate ESRD IACR (Fine Grained Soils)
   (Benzo(a)Pyrene/1.7) + (Benzo(a)Anthracene/1.6) + (Benzo(b,j)Fluoranthene/0.74) + (Benzo(k)Fluoranthene/0.16) + (Benzo(g,h,i)Perylene/32) + (Chrysene/10) + (Dibenzo(a,h)Anthracene/1.1) + (Indeno(1,2,3-c,d)Pyrene/13)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits.
9. Calculate ESRD IACR (Coarse Grained Soils)
   (Benzo(a)Pyrene/3.4) + (Benzo(a)Anthracene/3.1) + (Benzo(b,j)Fluoranthene/1.4) + (Benzo(k)Fluoranthene/0.31) + (Benzo(g,h,i)Perylene/63) + (Chrysene/19) + (Dibenzo(a,h)Anthracene/2.1) + (Indeno(1,2,3-c,d)Pyrene/24)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits.
10. Calculate CCME IACR
    (Benzo(a)Pyrene/0.37) + (Benzo(a)Anthracene/0.33) + (Benzo(b,j)Fluoranthene/0.16) + (Benzo(k)Fluoranthene/0.16) + (Benzo(g,h,i)Perylene/6.8) + (Chrysene/2.1) + (Dibenzo(a,h)Anthracene/0.23) + (Indeno(1,2,3-c,d)Pyrene/2.7)
    Non-Detect Isomer values calculated as 0.5 x detection limit.
    Final result value rounded to 2 significant digits
11. Superscript [#1]denotes values exceeding
    (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
    Acenaphthene:
    For ecological receptors only.
    SQG has not been calculated.
    Value presented is based on back calculated value for aquatic life pathway

Table 12
2017 Mainland Sites Phase II ESA
Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
CCME Industrial Fine Sub-Surface [#3]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**

Acenaphthylene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Anthracene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Benzo(a)Anthracene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Benzo(a)Pyrene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Benzo(a)Pyrene Total Potency Equivalent:
For protection of humans only, via inhalation, ingestion and dermal pathways.
Applies to carcinogenic PAHS only, for incremental lifetime cancer risk of 1x10-6

Benzo(a)Pyrene Total Potency Equivalent (CCME):
For protection of humans only, via inhalation, ingestion and dermal pathways.
Applies to carcinogenic PAHS only, for incremental lifetime cancer risk of 1x10-6

Benzo(k)Fluoranthene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Dibenzo(a,h)Anthracene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Fluoranthene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Fluorene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Indeno(1,2,3-c,d)Pyrene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Calculate CCME IACR:
For protection of humans only, via consumption of potable water (DUA) pathway.
Applies to carcinogenic PAHS only, for incremental liftime cancer risk of 1x10-6

Naphthalene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Phenanthrene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Pyrene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

12. Superscript [#2] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
13. Superscript [#3] denotes values exceeding
(CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 13
ARB Reclamation
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	General: Clay (%)	General: Silt (%)	General: Sand (%)	General: Organic matter (%)	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Salinity: Soluble Calcium (mg/L)	Salinity: Soluble Chloride (mg/L)	Salinity: Soluble Potassium (mg/L)	Salinity: Soluble Magnesium (mg/L)	Salinity: Soluble Sodium (mg/L)	Salinity: Soluble Sulphate (mg/L)	Salinity: Calcium (mg/kg)	Salinity: Chloride (mg/kg)	Salinity: Chloride (Calculated) (mg/kg)	Salinity: Potassium (mg/kg)	Salinity: Magnesium (mg/kg)	Salinity: Sodium (mg/kg)	Salinity: Sulphate (mg/kg)	Salinity: % Saturation (%)	Nutrients: Nitrite (as N) (mg/kg)	Nutrients: Nitrate as N (mg/kg)	Nutrients: Nitrate plus nitrite as N (mg/kg)	Nutrients: Total Kjeldahl Nitrogen (mg/kg)	Nutrients: Ammonia as N (mg/kg)	Nutrients: Nitrogen (mg/kg)	Nutrients: Potassium (mg/kg)	Nutrients: Phosphorus (mg/kg)	Nutrients: Sulphur (mg/kg)
CCME Industrial Fine Surface [#1]			---	---	---	---	**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ARB Reclamation																															
ARB-S01	09-Jun-2017	0.0 - 0.2m	19	41	39	---	1.4	3.4	7.60	120	67	5.0	24	150	490	56	31	31	2.3	11	73	230	47	< 0.50	7.7	7.7	< 5.0	< 2.0	< 10	41	< 4.0	72
ARB-S02	09-Jun-2017	0.0 - 0.2m	20	42	38	2.7	2.5	0.35	7.58	510	15	6.4	83	32	1600	240	7.3	7.1	3.0	39	15	730	47	< 0.50	0.94	0.94	< 5.0	< 2.0	< 10	41	< 4.0	310
ARB-S03	09-Jun-2017	0.0 - 0.2m	19	48	33	4.2	0.45	0.61	7.31	57	9.5	1.8	14	20	170	28	4.7	4.8	0.91	6.7	9.8	84	50	< 0.50	3.9	3.9	12	< 2.0	16	28	< 4.0	25

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 14
Biocell Sampling Results
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-30

Sampling Location	Date (dd-mmm-yyyy)	Salinity: Electrical Conductivity (dS/m)	Salinity: % Saturation (%)	Nutrients: Nitrite (as N) (mg/kg)	Nitrate as N (mg/kg)	Nitrate plus nitrite as N (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Ammonia as N (mg/kg)	Nitrogen (mg/kg)	Potassium (mg/kg)	Phosphorus (mg/kg)	Sulphur (mg/kg)
CCME Industrial Fine Surface [#1]		**4**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**
Biocell Sampling - 2017 Results												
W23-17-01	23-Aug-2017	2.4	39	---	---	---	---	---	---	---	---	---
	19-Sep-2017	3.3	37	---	---	---	---	---	---	---	---	---
W23-17-02	23-Aug-2017	2.2	43	---	---	---	---	---	---	---	---	---
	19-Sep-2017	2.7	37	---	---	---	---	---	---	---	---	---
W23-17-03	23-Aug-2017	2.6	38	---	---	---	---	---	---	---	---	---
	19-Sep-2017	2.7	40	---	---	---	---	---	---	---	---	---
W23-17-04	23-Aug-2017	2.9	36	---	---	---	---	---	---	---	---	---
	19-Sep-2017	2.9	39	---	---	---	---	---	---	---	---	---
W23-17-05	19-Sep-2017	2.9	37	---	---	---	---	---	---	---	---	---
W23A-17-01	21-Jun-2017	---	---	< 0.50	130	130	9.5	< 2.0	140	120	< 4.0	87
	16-Jul-2017	3.4	38	---	---	---	---	---	---	---	---	---
	23-Aug-2017	3.9	37	---	---	---	---	---	---	---	---	---
	19-Sep-2017	**4.2 [#1]**	37	---	---	---	---	---	---	---	---	---
W23A-17-02	21-Jun-2017	---	---	< 0.50	150	150	10	< 2.0	160	120	< 4.0	89
	16-Jul-2017	3.7	37	---	---	---	---	---	---	---	---	---
	23-Aug-2017	3.9	39	---	---	---	---	---	---	---	---	---
	19-Sep-2017	3.5	40	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 15
Biocell Sampling Results
Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (ug/g)	Toluene (ug/g)	Ethylbenzene (ug/g)	Xylenes (Total) (ug/g)	PHC F1 (C_6-C_{10}) - BTEX (ug/g)	PHC F2 (C_{10}-C_{16}) (ug/g)	PHC F3 (C_{16}-C_{34}) (ug/g)	PHC F4 (C_{34}-C_{50}) (ug/g)	Reached Baseline at C_{50} (none)	PHC F4 (C_{34}-C_{50+})-Gravimetric (ug/g)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]		**110**	**330**	**430**	**230**	**---**	**---**	**---**	**---**	**---**	**---**
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]		**---**	**---**	**---**	**---**	**320**	**260**	**2500**	**6600**	**---**	**6600**
Biocell Sampling - 2017 Results											
W7-17-01	19-Jun-2017	0.012	0.029	0.015	0.090	< 10	210	1900	770	NO	2600
	16-Jul-2017	0.0088	0.036	0.015	0.087	11	190	1900	760	NO	3900
	22-Aug-2017	0.015	0.034	0.018	0.11	< 10	200	1900	740	NO	2600
	19-Sep-2017	0.019	0.046	0.023	0.14	< 10	170	1800	670	NO	2700
W7-17-02	19-Jun-2017	0.011	0.027	0.017	0.089	< 10	190	1700	650	NO	2200
	16-Jul-2017	0.010	0.034	0.016	0.094	21	190	1700	660	NO	3700
	22-Aug-2017	0.015	0.035	0.021	0.11	< 10	170	1700	630	NO	2400
	19-Sep-2017	0.010	< 0.020	0.019	0.091	< 10	130	1500	670	NO	2800
W7-17-03	19-Jun-2017	0.0095	0.035	0.022	0.12	< 10	190	1700	700	NO	2800
	16-Jul-2017	0.012	0.042	0.023	0.15 [#3]	26	180	1900	740	NO	2600
	22-Aug-2017	0.015	0.035	0.022	0.11	< 10	150	1600	640	NO	2400
	19-Sep-2017	0.010	< 0.020	0.020	0.097	< 10	150	1700	710	NO	2900
W7-17-04	19-Jun-2017	0.010	0.027	0.017	0.083	< 10	160	1600	650	NO	2500
	16-Jul-2017	0.024	0.13	0.054	0.37	< 10	180	1900	720	NO	3100
	22-Aug-2017	0.017	0.045	0.026	0.14	12	170	1600	620	NO	2400
	19-Sep-2017	0.016	0.028	0.019	0.10 [#3]	< 10	150	1600	670	NO	2800
W8-17-01	21-Jun-2017	0.014	0.026	0.021	0.11 [#3]	< 10	**260** [#2]	2400	900	NO	3100
	16-Jul-2017	0.010	0.033	0.018	0.099	66	220	2100	820	NO	3000
	23-Aug-2017	0.014	0.026	0.021	0.12	< 10	140	1800	740	NO	2600
	19-Sep-2017	0.012	0.025	0.019	0.11	< 10	130	1800	770	NO	3200
W8-17-02	21-Jun-2017	0.016	0.031	0.026	0.13 [#3]	< 10	**300** [#2]	2400	890	NO	3200
	16-Jul-2017	0.022	0.031	0.027	0.14	< 10	210	2100	870	NO	4100
	23-Aug-2017	0.023	0.038	0.027	0.14	< 10	180	1900	750	NO	3300
	19-Sep-2017	0.014	0.028	0.024	0.12	15	160	1900	720	NO	3100
W8-17-03	21-Jun-2017	0.019	0.043	0.025	0.12	< 10	240	2200	810	NO	3100
	16-Jul-2017	0.017	0.034	0.025	0.13	< 10	200	1800	700	NO	2500
	23-Aug-2017	0.017	0.031	0.024	0.13	< 10	170	2000	820	NO	2700
	19-Sep-2017	0.011	0.029	0.021	0.12	15	210	2100	800	NO	3600
W8-17-04	21-Jun-2017	0.012	0.041	0.024	0.12	< 10	**290** [#2]	2200	830	NO	2900
	16-Jul-2017	0.0096	0.027	0.014	0.062	31	190	2100	860	NO	3200
	23-Aug-2017	0.014	0.031	0.023	0.13	< 10	170	1900	730	NO	2700
	19-Sep-2017	0.014	0.030	0.021	0.11	17	180	1900	710	NO	3100
W8-17-05	21-Jun-2017	0.016	0.027	0.020	0.11	< 10	170	1900	780	NO	2600
	19-Sep-2017	0.013	0.028	0.024	0.12	14	140	1800	710	NO	2900
W10-17-01	21-Jun-2017	0.018	0.035	0.019	0.11	< 10	150	2000	910	NO	3000
	16-Jul-2017	0.019	0.027	0.021	0.13	< 10	190	2300	1000	NO	4300
	23-Aug-2017	0.024	0.036	0.028	0.17	< 10	120	2000	970	NO	3400
	19-Sep-2017	0.015	< 0.020	0.019	0.11	11	76	1600	820	NO	3000
(Duplicate)	19-Sep-2017	0.014	< 0.020	0.018	0.11	12	72	1500	770	NO	3400
W10-17-02	21-Jun-2017	0.013	0.029	0.025	0.12	< 10	200	2400	1000	NO	3600
	16-Jul-2017	0.020	0.025	0.023	0.16	< 10	150	2300	1000	NO	4000
	23-Aug-2017	0.023	0.031	0.024	0.14	< 10	130	1900	890	NO	2900
	19-Sep-2017	0.016	< 0.020	0.018	0.11	< 10	81	1500	760	NO	2900
W10-17-03	21-Jun-2017	0.012	0.033	0.023	0.12	< 10	190	2300	1000	NO	3500
	16-Jul-2017	0.021	< 0.020	0.017	0.062	< 10	160	2300	1100	NO	3900
	23-Aug-2017	0.020	0.025	0.021	0.14	< 10	140	2200	1000	NO	3000
	19-Sep-2017	0.022	< 0.020	0.022	0.12	12	110	1700	790	NO	3200
W10-17-04	21-Jun-2017	0.012	0.032	0.024	0.14	< 10	140	2000	880	NO	3000
	16-Jul-2017	0.032	< 0.020	0.019	0.10	< 10	120	2000	960	NO	3900
	23-Aug-2017	0.017	< 0.020	0.016	0.11	< 10	88	1800	880	NO	3100
	19-Sep-2017	0.020	0.031	0.023	0.13	14	110	1700	810	NO	3000
W10-17-05	21-Jun-2017	0.016	0.034	0.025	0.13	< 10	140	2000	910	NO	3200
	19-Sep-2017	0.042	0.050	0.035	0.18	13	73	1500	740	NO	2700
W11-17-01	18-Jun-2017	0.046	0.099	0.028	0.24	12	69	510	210	YES	---
	14-Jul-2017	0.029	0.058	0.022	0.19	13	25	330	150	YES	---
W11-17-02	18-Jun-2017	0.025	0.058	0.017	0.18	13	34	330	140	YES	---
	14-Jul-2017	0.028	0.047	0.045	0.23	14	27	320	140	YES	---
W11-17-03	18-Jun-2017	0.031	0.067	0.019	0.19 [#3]	16	29	320	140	YES	---
	14-Jul-2017	0.018	0.037	0.013	0.12	13	20	240	100	YES	---
W11-17-04	18-Jun-2017	0.019	0.045	0.020	0.18	13	28	300	120	YES	---
	14-Jul-2017	0.019	0.038	0.014	0.13	< 10	21	260	110	YES	---
W11-17-05	18-Jun-2017	0.022	0.051	0.022	0.19	15	37	360	150	YES	---
	14-Jul-2017	0.018	0.051	0.019	0.16	12	58	420	170	YES	---
W11-17-06	14-Jul-2017	0.020	0.036	0.015	0.12	< 10	31	340	160	YES	---
W12-17-01	19-Jun-2017	0.017	0.094	0.075	0.36	27	**320** [#2]	1800	560	YES	---
	16-Jul-2017	0.013	0.089	0.083	0.36	63	**320** [#2]	1900	650	NO	3100
	22-Aug-2017	0.021	0.092	0.070	0.33	26	230	1500	520	NO	2000
	19-Sep-2017	0.032	0.16	0.075	0.36	28	**270** [#2]	1700	600	NO	2400
W12-17-02	19-Jun-2017	0.030	0.14	0.12	0.52	27	**330** [#2]	1800	580	NO	2100
	16-Jul-2017	0.020	0.13	0.11	0.45	41	**280** [#2]	1600	540	NO	2000
	22-Aug-2017	0.022	0.13	0.080	0.42	41	210	1400	500	NO	1700
	19-Sep-2017	0.036	0.24	0.14	0.65	39	**350** [#2]	1700	580	NO	2400
W12-17-03	19-Jun-2017	0.018	0.12	0.10	0.49	31	**340** [#2]	1700	590	NO	1900
	19-Sep-2017	0.019	0.11	0.070	0.37	47	**290** [#2]	1500	530	NO	2500
W12-17-04	19-Jun-2017	0.026	0.15	0.11	0.51	44	**380** [#2]	1900	650	NO	2200
	19-Sep-2017	0.023	0.15	0.081	0.41	47	250	1500	490	YES	---

Advisian
WorleyParsons Group

Table 15
Biocell Sampling Results
Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (ug/g)	Toluene (ug/g)	Ethylbenzene (ug/g)	Xylenes (Total) (ug/g)	PHC F1 (C_6-C_{10}) - BTEX (ug/g)	PHC F2 (C_{10}-C_{16}) (ug/g)	PHC F3 (C_{16}-C_{34}) (ug/g)	PHC F4 (C_{34}-C_{50}) (ug/g)	Reached Baseline at C_{50} (none)	PHC F4 (C_{34}-C_{50+})-Gravimetric (ug/g)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]		**110**	**330**	**430**	**230**	**---**	**---**	**---**	**---**	**---**	**---**
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]		**---**	**---**	**---**	**---**	**320**	**260**	**2500**	**6600**	**---**	**6600**
W13-17-01	18-Jun-2017	0.015	0.049	0.024	0.15	12	130	1300	470	YES	---
	14-Jul-2017	0.013	0.042	0.018	0.11	< 10	57	780	320	NO	3600
	20-Aug-2017	0.022	0.054	0.022	0.17	14	65	840	360	NO	1400
	19-Sep-2017	0.020	0.053	0.028	0.17 [#3]	16	58	840	380	NO	1800
W13-17-02	18-Jun-2017	0.024	0.089	0.037	0.23	10	88	900	330	YES	---
	14-Jul-2017	0.013	0.052	0.026	0.14	13	86	1000	420	NO	3000
	20-Aug-2017	0.033	0.13	0.065	0.35	27	71	960	400	NO	1500
	19-Sep-2017	0.039	0.14	0.071	0.36	38	62	810	350	NO	1500
W13-17-03	18-Jun-2017	0.018	0.061	0.026	0.17	11	110	1000	350	YES	---
	14-Jul-2017	0.012	0.054	0.021	0.13	13	76	990	400	NO	1500
	20-Aug-2017	0.025	0.074	0.030	0.19	12	79	1100	450	NO	1500
	19-Sep-2017	0.046	0.18	0.061	0.36	33	55	750	330	NO	1700
(Duplicate)	19-Sep-2017	0.028	0.060	0.031	0.17	24	40	630	290	YES	---
W13-17-04	18-Jun-2017	0.031	0.13	0.053	0.32	14	110	1100	390	YES	---
	14-Jul-2017	0.021	0.10	0.040	0.23	14	64	750	300	YES	---
	20-Aug-2017	0.028	0.070	0.030	0.18	< 10	49	980	400	NO	1500
	19-Sep-2017	0.022	0.061	0.031	0.16	27	47	670	300	NO	1400
W13-17-05	18-Jun-2017	0.015	0.050	0.026	0.15	10	110	1300	460	YES	---
	19-Sep-2017	0.042	0.11	0.050	0.26	24	68	830	360	NO	1800
W16-17-01	19-Jun-2017	0.011	0.027	0.025	0.061 [#3]	15	130	1500	680	NO	1900
	16-Jul-2017	0.013	0.037	0.015	0.079	33	150	1600	710	NO	2500
	22-Aug-2017	0.014	0.033	0.024	0.12	< 10	85	1300	600	NO	2200
	19-Sep-2017	0.021	0.051	0.032	0.18	23	120	1400	670	NO	2200
W16-17-02	19-Jun-2017	0.011	0.023	0.016	0.072	< 10	130	1500	700	NO	2500
	16-Jul-2017	0.0088	0.033	0.019	0.087	15	150	2200	1000	NO	3800
	22-Aug-2017	0.014	0.037	0.023	0.13	15	94	1300	620	NO	2100
	19-Sep-2017	0.029	0.053	0.032	0.15	11	140	1400	630	NO	2300
(Duplicate)	19-Sep-2017	0.016	0.032	0.021	0.10	12	120	1300	580	NO	2100
W16-17-03	19-Jun-2017	0.012	0.025	0.017	0.089	11	150	1700	810	NO	2500
	19-Sep-2017	0.025	0.037	0.032	0.14	22	110	1900	900	NO	4200
W16-17-04	19-Jun-2017	0.025	0.046	0.024	0.12	14	110	1200	550	NO	1600
	19-Sep-2017	0.020	0.058	0.043	0.19	24	120	1400	660	NO	2600
W17-17-01	18-Jun-2017	0.040	0.037	0.049	0.33	84	**610** [#2]	1800	660	YES	---
	14-Jul-2017	0.027	0.028	0.044	0.28	64	**870** [#2]	2300	810	YES	---
	20-Aug-2017	0.041	0.047	0.043	0.25	13	**700** [#2]	**2800** [#2]	1000	NO	3400
	19-Sep-2017	0.039	0.044	0.035	0.22	26	**340** [#2]	1700	680	NO	2800
W17-17-02	18-Jun-2017	0.067	0.078	0.052	0.37 [#3]	66	**870** [#2]	2300	830	YES	---
	14-Jul-2017	0.034	0.041	0.032	0.20	26	**460** [#2]	1400	540	NO	1800
	20-Aug-2017	0.056	0.062	0.053	0.28	37	**530** [#2]	2300	890	NO	3100
	19-Sep-2017	0.043	0.047	0.044	0.23	37	**590** [#2]	**2900** [#2]	1100	NO	4800
W18-17-01	19-Jun-2017	0.013	< 0.020	0.018	0.048	< 10	180	1500	530	YES	---
	16-Jul-2017	0.0098	0.027	0.015	0.054	16	150	1400	530	NO	3800
	22-Aug-2017	0.020	0.055	0.041	0.17	13	93	1000	390	NO	1900
	19-Sep-2017	0.014	0.031	0.019	0.10 [#3]	< 10	130	1400	580	NO	2400
W18-17-02	19-Jun-2017	0.011	< 0.020	0.020	0.092	12	170	1600	620	NO	2100
	16-Jul-2017	0.011	0.030	0.020	0.075	18	160	1500	560	NO	3300
	22-Aug-2017	0.015	0.031	0.020	0.11	14	150	1600	600	NO	2000
	19-Sep-2017	0.012	< 0.020	0.021	0.088	15	130	1500	610	NO	2500
W18-17-03	19-Jun-2017	0.0098	< 0.020	0.017	< 0.040	< 10	200	1600	580	NO	2000
	19-Sep-2017	0.015	0.029	0.020	0.090	< 10	120	1300	540	NO	2400
W18-17-04	19-Jun-2017	0.011	0.026	0.019	0.055	12	220	1700	600	NO	1800
	19-Sep-2017	0.016	0.044	0.035	0.15	18	150	1600	670	NO	2500
W19-17-01	19-Jun-2017	0.012	< 0.020	0.014	< 0.040	12	76	1600	930	NO	3000
	16-Jul-2017	0.012	0.032	0.015	0.077	22	120	2100	1100	NO	4800
	22-Aug-2017	0.020	0.035	0.021	0.098	13	95	1800	1000	NO	2800
	19-Sep-2017	0.020	0.051	0.024	0.079	20	95	1600	910	NO	1500
W19-17-02	19-Jun-2017	0.017	0.033	0.017	0.13	< 10	100	1800	1100	NO	3400
	16-Jul-2017	0.016	0.034	0.014	0.069	14	86	1800	1000	NO	3300
	22-Aug-2017	0.018	0.035	0.024	0.11	12	67	1400	780	NO	2900
	19-Sep-2017	0.017	0.029	0.019	0.093	11	75	1400	880	NO	3500
W19-17-03	19-Jun-2017	0.016	0.028	0.014	0.086	< 10	88	1600	950	NO	2700
	16-Jul-2017	0.014	0.029	0.012	< 0.040	< 10	78	1600	960	NO	4000
	22-Aug-2017	0.018	0.033	0.020	0.10	< 10	89	1600	970	NO	3200
	19-Sep-2017	0.014	< 0.020	0.016	0.084	< 10	84	1800	1100	NO	4300
W19-17-04	19-Jun-2017	0.018	0.042	0.030	0.11	< 10	77	1400	810	NO	2600
	16-Jul-2017	0.023	0.064	0.026	0.11 [#3]	11	71	1500	900	NO	3900
	22-Aug-2017	0.021	0.037	0.023	0.12	< 10	79	1500	870	NO	3200
	19-Sep-2017	0.017	0.034	0.020	0.11	11	71	1600	950	NO	3500
W22-17-01	21-Jun-2017	0.020	0.035	0.029	0.12	< 10	250	**3200** [#2]	1500	NO	5100
	16-Jul-2017	0.020	0.025	0.027	0.14	< 10	180	2400	1100	NO	4900
	23-Aug-2017	0.019	< 0.020	0.026	0.14	< 10	120	2300	1200	NO	4200
	19-Sep-2017	0.026	< 0.020	0.026	0.12	11	99	2000	1000	NO	4800
W22-17-02	21-Jun-2017	0.021	0.030	0.028	0.14	< 10	260 [#2]	**3000** [#2]	1400	NO	5400
	16-Jul-2017	0.018	< 0.020	0.017	0.059	< 10	200	**3000** [#2]	1500	NO	5300
	23-Aug-2017	0.021	0.025	0.027	0.16	< 10	130	2400	1200	NO	4700
	19-Sep-2017	0.018	< 0.020	0.021	0.11	14	110	2100	1100	NO	4800
(Duplicate)	19-Sep-2017	0.018	< 0.020	0.022	0.11	13	110	2200	1200	NO	4400
W22-17-03	21-Jun-2017	0.017	0.027	0.023	0.11	< 10	**370** [#2]	**3600** [#2]	1600	NO	5800
	16-Jul-2017	0.021	0.027	0.027	0.11	< 10	160	**2700** [#2]	1400	NO	5500
	23-Aug-2017	0.024	< 0.020	0.024	0.12	< 10	110	2300	1200	NO	4700
	19-Sep-2017	0.024	< 0.020	0.022	0.11	25	110	2200	1100	NO	4200

Advisian
WorleyParsons Group

Table 15
Biocell Sampling Results
Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (ug/g)	Toluene (ug/g)	Ethylbenzene (ug/g)	Xylenes (Total) (ug/g)	PHC F1 (C_6-C_{10}) - BTEX (ug/g)	PHC F2 (C_{10}-C_{16}) (ug/g)	PHC F3 (C_{16}-C_{34}) (ug/g)	PHC F4 (C_{34}-C_{50}) (ug/g)	Reached Baseline at C_{50} (none)	PHC F4 (C_{34}-C_{50+})-Gravimetric (ug/g)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]		**110**	**330**	**430**	**230**	**---**	**---**	**---**	**---**	**---**	**---**
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]		**---**	**---**	**---**	**---**	**320**	**260**	**2500**	**6600**	**---**	**6600**
W22-17-04	21-Jun-2017	0.019	0.032	0.027	0.14	< 10	160	**2600** [#2]	1300	NO	5100
	16-Jul-2017	0.022	< 0.020	0.021	0.12	< 10	150	2500 [#2]	1300	NO	5700
	23-Aug-2017	0.021	< 0.020	0.027	0.14	< 10	130	2400	1200	NO	4600
	19-Sep-2017	0.056	0.037	0.032	0.15	12	100	1900	950	NO	4400
W22-17-05	21-Jun-2017	0.016	0.031	0.024	0.11	< 10	210	**2700** [#2]	1300	NO	5000
	19-Sep-2017	0.026	0.033	0.024	0.12	13	97	2000	1100	NO	4600
W23-17-01	21-Jun-2017	0.018	0.027	0.025	0.074	< 10	150	2500 [#2]	1300	NO	4900
	16-Jul-2017	0.021	< 0.020	0.029	0.12	< 10	160	**2600** [#2]	1300	NO	**6800** [#2]
	23-Aug-2017	0.017	< 0.020	0.021	0.073	< 10	110	2200	1200	NO	4500
	19-Sep-2017	0.022	< 0.020	0.026	0.11	13	81	1800	950	NO	4600
W23-17-02	21-Jun-2017	0.018	0.028	0.021	0.059	< 10	130	**2600** [#2]	1300	NO	4400
	16-Jul-2017	0.021	< 0.020	0.023	0.11	< 10	210	**2800** [#2]	1400	NO	6000
	23-Aug-2017	0.021	< 0.020	0.024	0.11	< 10	120	2300	1200	NO	4600
	19-Sep-2017	0.019	< 0.020	0.021	0.091	11	84	1800	950	NO	4500
W23-17-03	21-Jun-2017	0.023	0.031	0.026	0.10	< 10	130	2500 [#2]	1300	NO	4400
	16-Jul-2017	0.019	< 0.020	0.026	0.11	< 10	140	**2600** [#2]	1500	NO	**8200** [#2]
	23-Aug-2017	0.021	< 0.020	0.026	0.12	< 10	110	2300	1200	NO	4300
	19-Sep-2017	0.018	< 0.020	0.023	0.067	13	99	1800	940	NO	4400
W23-17-04	21-Jun-2017	0.019	0.030	0.025	0.094 [#3]	< 10	140	2500 [#2]	1300	NO	4600
	16-Jul-2017	0.024	< 0.020	0.029	0.13	< 10	160	**2800** [#2]	1400	NO	5800
	23-Aug-2017	0.019	< 0.020	0.024	0.078	< 10	120	2300	1200	NO	4300
	19-Sep-2017	0.022	< 0.020	0.022	0.071	16	120	2100	1100	NO	4400
W23-17-05	21-Jun-2017	0.020	0.032	0.026	0.11	< 10	170	2500 [#2]	1200	NO	4400
	19-Sep-2017	0.018	< 0.020	0.023	0.076	13	100	2300	1200	NO	4300
W23A-17-01	21-Jun-2017	0.024	< 0.020	0.024	0.10	< 10	120	2200	1100	NO	4100
	16-Jul-2017	0.018	0.041	0.017	0.096	< 10	70	2000	1100	NO	5700
	23-Aug-2017	0.019	0.023	0.024	0.13	< 10	69	1800	950	NO	3200
	19-Sep-2017	0.022	0.024	0.024	0.11	< 10	53	1600	880	NO	3400
W23A-17-02	21-Jun-2017	0.022	0.038	0.031	0.13	< 10	170	2400	1100	NO	6000
	16-Jul-2017	0.021	< 0.020	0.021	0.062	< 10	98	2300	1200	NO	4100
	23-Aug-2017	0.019	< 0.020	0.030	0.15	11	67	1800	940	NO	3500
	19-Sep-2017	0.025	0.026	0.029	0.12	11	57	1700	940	NO	3500
W24A-17-01	19-Jun-2017	0.017	< 0.020	0.024	0.080	< 10	**560** [#2]	**3700** [#2]	1400	NO	6400
	16-Jul-2017	0.015	0.032	0.020	0.11	< 10	**430** [#2]	**3200** [#2]	1100	NO	5700
	22-Aug-2017	0.021	0.037	0.025	0.12	< 10	**320** [#2]	**3000** [#2]	1100	NO	4500
	19-Sep-2017	0.017	< 0.020	0.024	0.10 [#3]	14	**390** [#2]	**3300** [#2]	1200	NO	5200
W24A-17-02	19-Jun-2017	0.015	< 0.020	0.023	0.069	< 10	**560** [#2]	**3800** [#2]	1400	NO	5700
	16-Jul-2017	0.015	0.030	0.022	0.093 [#3]	50	**380** [#2]	**3000** [#2]	1100	NO	5000
	22-Aug-2017	0.021	< 0.020	0.027	0.13 [#3]	19	**430** [#2]	**3500** [#2]	1300	NO	4800
	19-Sep-2017	0.017	< 0.020	0.020	0.066	< 10	**380** [#2]	**3300** [#2]	1300	NO	5800
W24A-17-03	19-Jun-2017	0.015	< 0.020	0.023	0.072	< 10	**640** [#2]	**4200** [#2]	1600	NO	6000
	16-Jul-2017	0.013	0.026	0.027	0.087 [#3]	62	**510** [#2]	**3700** [#2]	1400	NO	**6900** [#2]
	22-Aug-2017	0.041	< 0.020	0.034	0.13 [#3]	< 10	**420** [#2]	**3300** [#2]	1300	NO	4800
	19-Sep-2017	0.019	0.025	0.026	0.11	< 10	**330** [#2]	**3100** [#2]	1200	NO	5200
W24A-17-04	19-Jun-2017	0.016	< 0.020	0.021	0.060	14	**640** [#2]	**4000** [#2]	1500	NO	6100
	19-Sep-2017	0.018	0.034	0.032	0.17	< 10	**380** [#2]	**3400** [#2]	1300	NO	5100
W24B-17-01	19-Jun-2017	0.020	< 0.020	0.027	0.081	11	**560** [#2]	**3700** [#2]	1400	NO	5800
	16-Jul-2017	0.023	0.028	0.032	0.14	< 10	**420** [#2]	**3200** [#2]	1100	NO	4700
	22-Aug-2017	0.019	0.033	0.027	0.14	16	**330** [#2]	**2900** [#2]	1100	NO	4100
	19-Sep-2017	0.024	0.026	0.028	0.11	10	**290** [#2]	**2700** [#2]	1100	NO	4500
(Duplicate)	19-Sep-2017	0.021	0.030 [#3]	0.025	0.12	< 10	**320** [#2]	**2900** [#2]	1100	NO	4900
W24B-17-02	19-Jun-2017	0.017	< 0.020	0.022	0.066	< 10	**580** [#2]	**3800** [#2]	1400	NO	5500
	16-Jul-2017	0.031	0.032	0.024	0.096	< 10	**490** [#2]	**3800** [#2]	1400	NO	5300
	22-Aug-2017	0.021	0.026	0.027	0.12	< 10	**340** [#2]	**3000** [#2]	1100	NO	4300
	19-Sep-2017	0.026	0.027	0.030	0.12	< 10	**310** [#2]	**2700** [#2]	1100	NO	5000
W24B-17-03	19-Jun-2017	0.015	< 0.020	0.025	0.068 [#3]	13	**560** [#2]	**3800** [#2]	1400	NO	5300
	16-Jul-2017	0.017	0.027	0.020	0.070	60	**480** [#2]	**3500** [#2]	1300	NO	5100
	22-Aug-2017	0.022	0.024	0.028	0.12	< 10	**400** [#2]	**3300** [#2]	1200	NO	4700
	19-Sep-2017	0.036	0.054	0.045	0.19	< 10	**380** [#2]	**3300** [#2]	1200	NO	5900
W24B-17-04	19-Jun-2017	0.020	< 0.020	0.028	0.075	17	**560** [#2]	**3700** [#2]	1400	NO	5700
	19-Sep-2017	0.034	0.034	0.033	0.13	< 10	**350** [#2]	**3000** [#2]	1200	NO	5600
W25A-17-01	21-Jun-2017	0.019	0.059	0.028	0.21	14	71	1300	540	NO	1700
	16-Jul-2017	0.032	0.030	0.019	0.12	< 10	69	1400	630	NO	2900
	23-Aug-2017	0.026	0.047	0.022	0.17	< 10	60	1200	560	NO	1600
	19-Sep-2017	0.028	0.064	0.027	0.22	16	43	920	460	NO	1800
W25A-17-02	21-Jun-2017	0.021	0.043	0.024	0.19	12	67	1200	490	NO	1700
	16-Jul-2017	0.027	0.053	0.023	0.18	< 10	60	1200	570	NO	2100
	23-Aug-2017	0.038	0.072	0.027	0.21	< 10	49	1100	490	NO	1500
	19-Sep-2017	0.019	0.041	0.020	0.14	< 10	42	1100	520	NO	2000
W25A-17-03	19-Sep-2017	0.029	0.078	0.025	0.21	13	65	1000	500	NO	2100
W25A-17-04	19-Sep-2017	0.037	0.11	0.032	0.27	14	55	1200	570	NO	2400
W25B-17-01	21-Jun-2017	0.019	0.054	0.019	0.14	< 10	44	850	360	NO	1000
	16-Jul-2017	0.027	0.052	0.020	0.17	< 10	42	960	440	NO	2900
	23-Aug-2017	0.022	0.046	0.019	0.16	< 10	42	930	410	NO	1300
	19-Sep-2017	0.020	0.038	0.017	0.15	17	39	800	390	NO	1600

Advisian
WorleyParsons Group

Table 15
Biocell Sampling Results
Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Benzene (ug/g)	Toluene (ug/g)	Ethylbenzene (ug/g)	Xylenes (Total) (ug/g)	PHC F1 (C_6-C_{10}) - BTEX (ug/g)	PHC F2 (C_{10}-C_{16}) (ug/g)	PHC F3 (C_{16}-C_{34}) (ug/g)	PHC F4 (C_{34}-C_{50}) (ug/g)	Reached Baseline at C_{50} (none)	PHC F4 (C_{34}-C_{50+})-Gravimetric (ug/g)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]		**110**	**330**	**430**	**230**	**---**	**---**	**---**	**---**	**---**	**---**
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]		**---**	**---**	**---**	**---**	**320**	**260**	**2500**	**6600**	**---**	**6600**
W25B-17-02	21-Jun-2017	0.027	0.064	0.027	0.18	13	43	860	370	NO	1200
	16-Jul-2017	0.022	0.045	0.016	0.13	< 10	44	970	460	NO	2400
	23-Aug-2017	0.024	0.050	0.022	0.17	< 10	34	790	400	NO	1500
	19-Sep-2017	0.016	0.044	0.024	0.21	14	38	890	430	NO	1800
(Duplicate)	19-Sep-2017	0.018	0.045	0.020	0.15	14	40	1000	490	NO	1800
W25B-17-03	19-Sep-2017	0.017	0.032	0.016	0.13	13	41	860	420	NO	1500
W25B-17-04	19-Sep-2017	0.021	0.039	0.020	0.17	14	33	840	420	NO	1600

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Surface Soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
8. Superscript [#3] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

Advisian
WorleyParsons Group

Table 16
Biocell Sampling Results
Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
Biocell Sampling - 2017 Results																														
W25A-17-01	21-Jun-2017		< 0.0050	< 0.0050	---	< 0.0040	0.0066 [#2]	< 0.0050	0.0080	0.0079	0.0079	0.014	---	---	0.019	< 0.0050	0.012	< 0.0050	0.0075	0.0050 [#2]	< 0.0050	0.044	0.023	0.15	---	0.0083	---	0.027	0.019	---
	23-Aug-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	0.0082 [#2]	< 0.0050	0.0080	0.0083	0.0083	0.016	< 0.0050	0.048	0.021	< 0.0050	0.012	< 0.0050	< 0.0050	0.0053	< 0.0050	0.048	0.025	0.17	0.072	**0.018 [#1]**	0.037	0.044	0.024	< 0.010
	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0071	0.0071	0.011	< 0.0050	0.034	0.016	< 0.0050	0.011	< 0.0050	< 0.0050	0.0065	< 0.0050	0.038	0.020	0.12	0.092	**0.027 [#1]**	0.033	0.035	0.013	< 0.010
W25A-17-02	21-Jun-2017		< 0.0050	< 0.0050	---	< 0.0040	0.0059 [#2]	< 0.0050	0.0080	0.0080	0.0080	0.013	---	---	0.020	< 0.0050	0.012	< 0.0050	0.0068	< 0.0050	0.0051	0.043	0.022	0.14	---	0.0073	---	0.027	0.018	---
	23-Aug-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	0.0078	< 0.0050	0.0080	0.0079	0.0079	0.013	< 0.0050	0.050	0.023	< 0.0050	0.0085	< 0.0050	< 0.0050	0.0068	< 0.0050	0.044	0.023	0.15	0.080	**0.020 [#1]**	0.037	0.034	0.019	< 0.010
	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0074	0.0074	0.014	< 0.0050	0.040	0.018	< 0.0050	0.010	< 0.0050	< 0.0050	0.0060	< 0.0050	0.042	0.022	0.14	0.066	**0.019 [#1]**	0.036	0.032	0.014	< 0.010
W25A-17-03	19-Sep-2017		0.0061 [#2]	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0073	0.0073	0.012	< 0.0050	0.038	0.018	< 0.0050	0.014	< 0.0050	< 0.0050	0.0092	< 0.0050	0.039	0.020	0.13	0.086	**0.022 [#1]**	0.035	**0.079 [#1]**	0.018	< 0.010
W25A-17-04	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0073	0.0073	0.012	< 0.0050	0.040	0.018	< 0.0050	0.012	< 0.0050	< 0.0050	0.0064	< 0.0050	0.039	0.020	0.13	0.080	**0.022 [#1]**	0.038	0.039	0.015	< 0.010
W25B-17-01	21-Jun-2017		< 0.0050	< 0.0050	---	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0075	0.0075	0.014	---	---	0.020	< 0.0050	0.012	< 0.0050	0.0051	< 0.0050	< 0.0050	0.042	0.022	0.14	---	0.0062	---	0.022	0.016	---
	23-Aug-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	0.0055 [#2]	< 0.0050	0.0080	0.0077	0.0077	0.014	< 0.0050	0.037	0.020	< 0.0050	0.0098	< 0.0050	< 0.0050	0.0052	< 0.0050	0.044	0.023	0.15	0.057	**0.015 [#1]**	0.044	0.032	0.016	< 0.010
	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0072	0.0072	0.012	< 0.0050	0.034	0.018	< 0.0050	0.011	< 0.0050	< 0.0050	0.0056	< 0.0050	0.039	0.020	0.12	0.061	**0.017 [#1]**	0.036	0.038	0.014	< 0.010
W25B-17-02	21-Jun-2017		< 0.0050	< 0.0050	---	< 0.0040	< 0.0050 [#2]	< 0.0050	< 0.0071	0.0073	0.0073	0.012	---	---	0.020	< 0.0050	0.011	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.039	0.020	0.12	---	0.0064	---	0.021	0.014	---
	23-Aug-2017		0.0071 [#2]	< 0.0050	< 0.010	< 0.0040	0.025	0.032	0.055	0.055	0.055	0.037	< 0.0050	0.094	0.047	< 0.0050	0.047	0.014	0.014	0.010	0.013	0.12	0.062	0.50	0.069	**0.020 [#1]**	0.050	**0.074 [#1]**	0.068	< 0.010
	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0054	0.010	0.010	0.010	0.013	< 0.0050	0.039	0.020	< 0.0050	0.013	< 0.0050	< 0.0050	0.0054	< 0.0050	0.042	0.022	0.14	0.056	**0.016 [#1]**	0.039	0.031	0.015	< 0.010
(Duplicate)	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0074	0.0074	0.013	< 0.0050	0.039	0.020	< 0.0050	0.014	< 0.0050	< 0.0050	0.0068	< 0.0050	0.041	0.021	0.13	0.064	**0.019 [#1]**	0.043	0.036	0.017	< 0.010
W25B-17-03	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0075	0.0075	0.014	< 0.0050	0.034	0.018	< 0.0050	0.012	< 0.0050	< 0.0050	0.0078	< 0.0050	0.042	0.022	0.14	0.070	**0.016 [#1]**	0.039	**0.049 [#1]**	0.016	< 0.010
W25B-17-04	19-Sep-2017		< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0073	0.0073	0.012	< 0.0050	0.040	0.021	< 0.0050	0.014	< 0.0050	< 0.0050	0.0068	< 0.0050	0.039	0.021	0.13	0.063	**0.017 [#1]**	0.044	0.033	0.015	< 0.010

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Benzo(a)Pyrene Total Potency Equivalent (CCME)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits
7. Benzo(a)Pyrene Total Potency Equivalent (ESRD)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits

Advisian
WorleyParsons Group

Table 16
Biocell Sampling Results
Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**

8. Calculate ESRD IACR (Fine Grained Soils)
(Benzo(a)Pyrene/1.7) + (Benzo(a)Anthracene/1.6) + (Benzo(b,j)Fluoranthene/0.74) + (Benzo(k)Fluoranthene/0.16) + (Benzo(g,h,i)Perylene/32) + (Chrysene/10) + (Dibenzo(a,h)Anthracene/1.1) + (Indeno(1,2,3-c,d)Pyrene/13)
Non-Detect Isomer values calculated as 0.5 x detection limit.
Final result value rounded to 2 significant digits.
9. Calculate ESRD IACR (Coarse Grained Soils)
(Benzo(a)Pyrene/3.4) + (Benzo(a)Anthracene/3.1) + (Benzo(b,j)Fluoranthene/1.4) + (Benzo(k)Fluoranthene/0.31) + (Benzo(g,h,i)Perylene/63) + (Chrysene/19) + (Dibenzo(a,h)Anthracene/2.1) + (Indeno(1,2,3-c,d)Pyrene/24)
Non-Detect Isomer values calculated as 0.5 x detection limit.
Final result value rounded to 2 significant digits.
10. Calculate CCME IACR
(Benzo(a)Pyrene/0.37) + (Benzo(a)Anthracene/0.33) + (Benzo(b,j)Fluoranthene/0.16) + (Benzo(k)Fluoranthene/0.16) + (Benzo(g,h,i)Perylene/6.8) + (Chrysene/2.1) + (Dibenzo(a,h)Anthracene/0.23) + (Indeno(1,2,3-c,d)Pyrene/2.7)
Non-Detect Isomer values calculated as 0.5 x detection limit.
Final result value rounded to 2 significant digits
11. Superscript [#1] denotes values exceeding
(CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)

Acenaphthene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Acenaphthylene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Anthracene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Benzo(a)Anthracene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Benzo(a)Pyrene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Benzo(a)Pyrene Total Potency Equivalent:
For protection of humans only, via inhalation, ingestion and dermal pathways.
Applies to carcinogenic PAHS only, for incremental lifetime cancer risk of 1x10-6

Benzo(a)Pyrene Total Potency Equivalent (CCME):
For protection of humans only, via inhalation, ingestion and dermal pathways.
Applies to carcinogenic PAHS only, for incremental lifetime cancer risk of 1x10-6

Benzo(k)Fluoranthene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Dibenzo(a,h)Anthracene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Table 16
Biocell Sampling Results
Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**

Fluoranthene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only
Fluorene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway
Indeno(1,2,3-c,d)Pyrene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG
Calculate CCME IACR:
For protection of humans only, via consumption of potable water (DUA) pathway.
Applies to carcinogenic PAHS only, for incremental liftime cancer risk of 1x10-6
Naphthalene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway
Phenanthrene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway
Pyrene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

12. Superscript [#2] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

Advisian
WorleyParsons Group

Table 17
Refinery Bank Well Installations
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	General: Texture Class (none)	Salinity: Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Chloride (Calculated) (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Industrial Fine Surface #1			---	**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Industrial Fine Sub-Surface #2			---	**4**	**12**	**(6 - 8)**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Refinery Bank - 2017 Well Installations																				
RB-MW17-01	12-Jun-2017	1.0 - 1.5m	FINE	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-02	12-Jun-2017	1.5 - 2.0m	---	0.50	1.0	7.65	50	< 5.0	16	12	32	130	33	< 3.2	< 3.2	10	7.8	20	81	64
	12-Jun-2017	2.6 - 3.0m	---	0.36	1.5	7.72	26	49	13	8.6	35	160	14	26	26	7.2	4.7	19	87	54
RB-MW17-03	13-Jun-2017	4.0 - 4.5m	FINE	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-05	13-Jun-2017	3.0 - 3.5m	---	0.45	0.80	7.82	55	5.4	11	7.5	24	100	32	3.1	3.1	6.4	4.4	14	59	58
(Duplicate)	13-Jun-2017	3.0 - 3.5m	---	0.54	0.85	7.65	67	8.2	12	9.7	28	120	38	4.7	4.7	6.6	5.6	16	67	57
	13-Jun-2017	4.0 - 4.5m	FINE	0.41	3.3	7.82	18	40	15	3.7	59	99	9.6	22	22	8.4	2.0	32	54	55
RB-MW17-07	13-Jun-2017	4.5 - 5.0m	FINE	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript #1 denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
8. Superscript #2 denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 18
Refinery Bank Well Installations
Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	General: % Moisture (%)	General: Sieve #200 (>0.075mm) (%)	General: Sieve - Pan (%)	Petroleum Hydrocarbons (PHCs): Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)	Reached Baseline at C_{50} (none)
CCME CSQG, Industrial, Fine, Surface, GW Check and Indoor Air Paths Excluded [#1]			---	---	---	**110**	**330**	**430**	**230**	---	---	---	---	---	---
CCME PHC in Soil, Industrial, Fine, Surface, Potable GW Excluded [#2]			---	---	---	---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---
CCME CSQG, Industrial, Fine, Sub-Surface, GW Check and Indoor Air Paths Excluded [#4]			---	---	---	**620**	**660**	**860**	**460**	---	---	---	---	---	---
CCME PHC in Soil, Industrial, Fine, Sub-Surface, Potable GW Excluded [#5]			---	---	---	---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---
Refinery Bank - 2017 Well Installations															
RB-MW17-01	12-Jun-2017	0.0 - 0.4m	24	---	---	0.069	< 0.020	0.016	0.066	12	97	1600	800	2900	NO
	12-Jun-2017	1.0 - 1.5m	20	38.2	61.8	33	0.88 [#3]	6.3	**320** [#1]	**47000** [#2]	**10000** [#2]	**8100** [#2]	2300	---	YES
	12-Jun-2017	1.5 - 2.0m	13	---	---	1.7	0.034 [#3]	0.11	1.5 [#3]	280	**1400** [#2]	**2600** [#2]	920	---	YES
(Duplicate)	12-Jun-2017	1.5 - 2.0m	15	---	---	2.5	0.029 [#3]	0.17	2.4	**440** [#2]	**2700** [#2]	**3400** [#2]	1100	---	YES
RB-MW17-02	12-Jun-2017	0.5 - 1.0m	13	---	---	0.16	0.031 [#3]	0.055	0.28	170	**1800** [#2]	**3500** [#2]	1200	---	YES
	12-Jun-2017	1.5 - 2.0m	12	---	---	3.3	0.20	5.6	17	**1600** [#2]	**3400** [#2]	2000	390	---	YES
	12-Jun-2017	2.6 - 3.0m	17	---	---	6.7	0.20 [#3]	5.9	74	**4600** [#2]	**4800** [#2]	**4100** [#2]	1100	---	YES
	12-Jun-2017	3.5 - 3.75m	18	---	---	1.4	0.053 [#3]	0.24	5.2	**870** [#5]	**1600** [#5]	2300	720	---	YES
RB-MW17-03	13-Jun-2017	0.0 - 0.5m	14	---	---	0.20	0.039	0.046	0.23	32	**340** [#2]	1800	730	2800	NO
	13-Jun-2017	1.5 - 1.8m	12	---	---	22	85	36	180	**5600** [#2,3]	**9600** [#2]	**4300** [#2]	710	---	YES
	13-Jun-2017	4.0 - 4.5m	19	9.4	90.6	3.4	0.48	1.2	11	**1200** [#5]	**2800** [#5]	3300	940	---	YES
RB-MW17-04	13-Jun-2017	1.0 - 1.5m	11	---	---	0.89	0.12	0.033	0.18	39	260 [#2]	1500	640	2500	NO
	13-Jun-2017	1.5 - 2.0m	13	---	---	12	54	28	130	**6100** [#2]	**6800** [#2]	**3400** [#2]	560	---	YES
	13-Jun-2017	3.5 - 4.0m	19	---	---	7.4	28	12	57	**3000** [#5]	**2500** [#5]	2300	570	---	YES
RB-MW17-05	13-Jun-2017	3.0 - 3.5m	14	---	---	9.2	19	7.1	33	**1900** [#5]	**3600** [#5]	4500	1300	---	YES
(Duplicate)	13-Jun-2017	3.0 - 3.5m	15	---	---	7.8	18	6.3	31	**1200** [#5]	**3200** [#5]	4200	1300	---	YES
	13-Jun-2017	4.0 - 4.5m	8.1	6.4	93.6	0.51	0.29	0.040	0.18	81	1000 [#5]	2000	680	3000	NO
RB-MW17-06	13-Jun-2017	2.5 - 3.0m	19	---	---	16	35	13	59	**2300** [#2]	**3800** [#2]	**4800** [#2]	1400	---	YES
	13-Jun-2017	3.5 - 4.0m	17	---	---	14	32	10	47	**1800** [#5]	**2700** [#5]	3900	1300	7300	NO
RB-MW17-07	13-Jun-2017	2.5 - 3.0m	11	---	---	1.2	1.2	2.9	12	**1600** [#2]	**3800** [#2]	**7000** [#2]	2400	**13000** [#2]	NO
	13-Jun-2017	4.5 - 5.0m	16	7.1	92.9	0.75	0.73	0.70	3.2	340	980	1700	580	2600	NO

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Surface Soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
8. Superscript [#3] - Detection limits raised due to dilution to bring analyte within the calibrated range.
11. Superscript [#4] denotes values exceeding
    (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
12. Superscript [#5] denotes values exceeding
    (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 19
Refinery Bank Well Installations
Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
CCME Industrial Fine Sub-Surface [#3]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
Refinery Bank - 2017 Well Installations																															
RB-MW17-02	12-Jun-2017	1.5 - 2.0m	0.090 [#2]	0.13	---	< 0.0040	0.021 [#2]	< 0.0050	0.011	0.011	0.011	0.027	---	---	0.032	< 0.0050	0.072	< 0.0050	0.0060	**0.46** [#1]	< 0.0050	0.077	0.040	0.31	---	**2.4** [#1]	---	**0.96** [#1]	0.043	---
	12-Jun-2017	2.6 - 3.0m	0.11	0.18 [#2]	---	0.050	0.041 [#2]	< 0.0050	0.017	0.017	0.017	0.039	---	---	0.038	< 0.0050	0.11	< 0.0050	0.0094	**0.68** [#1]	0.020	0.11	0.058	0.47	---	**3.4** [#1]	---	**1.4** [#1]	0.065	---
RB-MW17-05	13-Jun-2017	3.0 - 3.5m	0.18	0.13 [#2]	---	< 0.0040	0.040 [#2]	< 0.0050	0.016	0.016	0.016	0.039	---	---	0.027	< 0.0050	0.13	< 0.0050	0.014	**0.51** [#1]	0.0093 [#2]	0.11	0.058	0.47	---	**1.7** [#1]	---	**1.5** [#1]	0.075	---
(Duplicate)	13-Jun-2017	3.0 - 3.5m	0.16	0.12 [#2]	---	< 0.0040	0.035 [#2]	< 0.0050	0.015	0.015	0.015	0.034	---	---	0.023	< 0.0050	0.11	< 0.0050	0.011	**0.45** [#1]	0.013 [#2]	0.10	0.052	0.41	---	**1.2** [#1]	---	**1.3** [#1]	0.076	---
	13-Jun-2017	4.0 - 4.5m	0.059	0.023 [#2]	---	< 0.0040	0.027 [#2]	< 0.0050	0.013	0.013	0.013	0.030	---	---	0.029	< 0.0050	0.082	< 0.0050	0.0073	0.11	0.011 [#2]	0.087	0.045	0.35	---	**0.077** [#3]	---	**0.67** [#3]	0.048	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Benzo(a)Pyrene Total Potency Equivalent (CCME)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits
7. Benzo(a)Pyrene Total Potency Equivalent (ESRD)
   (Benzo(a)Pyrene*1) + (Benzo(a)Anthracene*0.1) + (Benzo(b,j,K)Fluoranthene*0.1) + (Benzo(g,h,i)Perylene*0.01) + (Chrysene*0.01) + (Dibenzo(a,h)Anthracene*1) + (Indeno(1,2,3-c,d)Pyrene*0.1)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits
8. Calculate ESRD IACR (Fine Grained Soils)
   (Benzo(a)Pyrene/1.7) + (Benzo(a)Anthracene/1.6) + (Benzo(b,j)Fluoranthene/0.74) + (Benzo(k)Fluoranthene/0.16) + (Benzo(g,h,i)Perylene/32) + (Chrysene/10) + (Dibenzo(a,h)Anthracene/1.1) + (Indeno(1,2,3-c,d)Pyrene/13)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits.
9. Calculate ESRD IACR (Coarse Grained Soils)
   (Benzo(a)Pyrene/3.4) + (Benzo(a)Anthracene/3.1) + (Benzo(b,j)Fluoranthene/1.4) + (Benzo(k)Fluoranthene/0.31) + (Benzo(g,h,i)Perylene/63) + (Chrysene/19) + (Dibenzo(a,h)Anthracene/2.1) + (Indeno(1,2,3-c,d)Pyrene/24)
   Non-Detect Isomer values calculated as 0.5 x detection limit.
   Final result value rounded to 2 significant digits.
10. Calculate CCME IACR
    (Benzo(a)Pyrene/0.37) + (Benzo(a)Anthracene/0.33) + (Benzo(b,j)Fluoranthene/0.16) + (Benzo(k)Fluoranthene/0.16) + (Benzo(g,h,i)Perylene/6.8) + (Chrysene/2.1) + (Dibenzo(a,h)Anthracene/0.23) + (Indeno(1,2,3-c,d)Pyrene/2.7)
    Non-Detect Isomer values calculated as 0.5 x detection limit.
    Final result value rounded to 2 significant digits

Table 19
Refinery Bank Well Installations
Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**
CCME Industrial Fine Sub-Surface [#3]			**0.28**	**320**	**---**	**32**	**10**	**72**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**10**	**---**	**10**	**180**	**0.25**	**10**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**100**	**---**

11. Superscript [#1] denotes values exceeding
(CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)

Acenaphthene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Acenaphthylene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Anthracene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Benzo(a)Anthracene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Benzo(a)Pyrene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Benzo(a)Pyrene Total Potency Equivalent:
For protection of humans only, via inhalation, ingestion and dermal pathways.
Applies to carcinogenic PAHS only, for incremental lifetime cancer risk of 1x10-5

Benzo(a)Pyrene Total Potency Equivalent (CCME):
For protection of humans only, via inhalation, ingestion and dermal pathways.
Applies to carcinogenic PAHS only, for incremental lifetime cancer risk of 1x10-5

Benzo(k)Fluoranthene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Dibenzo(a,h)Anthracene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Fluoranthene:
For ecological receptors only.
Value presented is current SQG and based on direct contact pathway only

Fluorene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Indeno(1,2,3-c,d)Pyrene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

Calculate CCME IACR:
For protection of humans only, via consumption of potable water (DUA) pathway.
Applies to carcinogenic PAHS only, for incremental liftime cancer risk of 1x10-5

Advisian
WorleyParsons Group

Table 19
Refinery Bank Well Installations
Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Industrial Fine Surface [#1]			0.28	320	---	32	10	72	5.3	5.3	---	---	---	---	---	10	---	10	180	0.25	10	---	---	1	---	0.013	---	0.046	100	---
CCME Industrial Fine Sub-Surface [#3]			0.28	320	---	32	10	72	5.3	5.3	---	---	---	---	---	10	---	10	180	0.25	10	---	---	1	---	0.013	---	0.046	100	---

Naphthalene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Phenanthrene:
For ecological receptors only.
SQG has not been calculated.
Value presented is based on back calculated value for aquatic life pathway

Pyrene:
For ecological receptors only. New SQG not calculated, interim 1991 value retained as SQG

12. Superscript [#2] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
11. Superscript [#3]denotes values exceeding
(CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 20
2017 Islands Sites Phase II ESA
Soil Analytical Results: General and Salinity Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Calcium (mg/L)	Soluble Chloride (mg/L)	Soluble Potassium (mg/L)	Soluble Magnesium (mg/L)	Soluble Sodium (mg/L)	Soluble Sulphate (mg/L)	Calcium (mg/kg)	Chloride (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Sodium (mg/kg)	Sulphate (mg/kg)	% Saturation (%)
CCME Residential/Parkland Coarse Surface [#1]			2	5	(6 - 8)	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Residential/Parkland Coarse Sub-Surface [#2]			2	5	(6 - 8)	---	---	---	---	---	---	---	---	---	---	---	---	---
BEAR ISLAND SUMP 6																		
BIS6-17-1	26-Sep-2017	1.0 - 1.5m	1.8	0.44	7.54	290	44	16	91	34	970	180	27	9.9	56	21	600	61
	26-Sep-2017	2.0 - 2.5m	2.4 [#1]	0.42	7.35	480	21	11	76	37	1400	230	10	5.1	36	18	680	48
BIS6-17-2	26-Sep-2017	0.0 - 0.5m	0.77	0.33	7.39	110	13	9.3	30	15	220	83	9.1	6.8	21	11	160	73
BIS6-17-3	26-Sep-2017	0.5 - 1.0m	0.82	0.36	7.47	130	22	7.7	23	17	280	81	14	4.8	15	11	180	63
	26-Sep-2017	1.5 - 2.0m	2.5 [#1]	0.30	7.23	490	41	15	92	27	1500	290	24	8.9	54	16	860	59
BIS6-17-4	26-Sep-2017	0.0 - 0.5m	0.69	0.30	7.46	100	18	12	38	14	130	88	15	9.9	32	12	110	84
BIS6-17-5	26-Sep-2017	0.5 - 1.0m	7.0 [#1]	3.8	7.51	860	1600 [#3]	21	230	490	1700	410	780	10	110	230	790	47
	26-Sep-2017	2.5 - 3.0m	4.5 [#1]	8.9 [#1]	7.62	300	1100 [#3]	20	35	610	530	140	520	9.6	16	290	250	47
(Duplicate)	26-Sep-2017	2.5 - 3.0m	4.3 [#1]	9.8 [#1]	7.60	250	1100 [#3]	22	27	610	430	120	530	10	13	290	210	48
	26-Sep-2017	3.0 - 3.5m	4.0 [#2]	10 [#2]	7.78	210	1100 [#3]	26	24	580	430	86	450	11	9.7	240	180	41
	26-Sep-2017	4.0 - 4.5m	5.4 [#2]	4.2	7.53	730	1100 [#3]	16	87	450	1400	320	490	7.0	38	200	600	44
BEAR ISLAND BIBT1																		
BIBT1-17-1	27-Sep-2017	0.0 - 1.0m	0.49	0.61	7.52	67	17	8.9	14	21	100	30	7.8	4.0	6.2	9.4	45	45
	27-Sep-2017	1.5 - 2.0m	0.75	0.44	7.51	91	41	14	29	19	260	36	16	5.4	11	7.3	100	39
BIBT1-17-2	27-Sep-2017	0.5 - 1.0m	0.51	0.63	7.81	71	21	9.3	14	22	110	30	9.0	3.9	6.1	9.5	48	42
	27-Sep-2017	2.0 - 2.5m	0.50	0.79	7.69	51	26	10	11	24	130	17	8.7	3.5	3.5	8.0	44	33
BIBT1-17-3	27-Sep-2017	0.5 - 1.0m	1.3	0.56	7.45	160	170	11	47	31	330	84	92	5.7	25	16	180	53
	27-Sep-2017	1.0 - 1.5m	1.4	1.3	7.30	140	300	13	52	68	170	86	190	7.8	32	42	100	62
(Duplicate)	27-Sep-2017	1.0 - 1.5m	1.3	1.2	7.22	120	280	9.3	44	60	130	80	180	6.2	29	39	89	66
	27-Sep-2017	3.0 - 3.5m	0.83	0.69	7.47	110	23	13	22	30	110	42	8.6	5.1	8.4	12	42	38
BIFP																		
BIFP-17-1	25-Sep-2017	1.0 - 1.5m	0.90	0.38	7.37	160	15	5.2	23	19	390	80	7.8	2.6	12	9.8	200	51
	25-Sep-2017	4.5 - 5.0m	1.7	0.34	7.56	330	17	9.4	48	25	890	120	5.8	3.3	17	8.8	310	35
	25-Sep-2017	5.5 - 6.0m	0.77	0.42	7.62	120	15	7.2	18	18	320	39	5.1	2.4	5.8	6.1	110	33
BIFP-17-2	25-Sep-2017	0.5 - 1.0m	0.38	0.51	7.47	64	5.9	2.2	13	17	75	28	2.6	0.98	5.6	7.4	33	44
BIFP-17-3	25-Sep-2017	1.0 - 1.5m	2.9 [#1]	0.38	7.49	590	50	10	140	40	1900	280	24	5.0	69	19	920	48
	25-Sep-2017	4.0 - 4.5m	1.6	0.31	7.58	320	53	13	42	22	830	130	22	5.3	17	9.1	340	41
	25-Sep-2017	5.0 - 5.5m	0.54	0.85	7.70	71	34	7.8	12	30	110	22	10	2.4	3.7	9.0	35	31
BIFP-17-4	25-Sep-2017	1.0 - 1.5m	0.35	0.49	7.47	57	9.9	8.3	8.5	15	50	22	3.7	3.1	3.2	5.7	19	38
	25-Sep-2017	2.0 - 2.5m	0.38	0.62	7.55	56	13	8.2	7.7	18	87	18	3.9	2.6	2.4	5.8	28	32
BIFP-17-5	25-Sep-2017	0.5 - 1.0m	0.37	0.53	7.64	68	9.1	4.5	7.9	17	50	32	4.2	2.1	3.7	8.1	23	46
	25-Sep-2017	1.5 - 2.0m	0.39	0.45	7.45	64	15	9.5	8.7	14	70	26	6.0	3.8	3.5	5.8	28	40
BIFP-17-6	25-Sep-2017	0.5 - 1.0m	0.42	0.44	7.61	74	16	9.7	13	16	100	37	8.1	4.9	6.6	7.9	50	50
	25-Sep-2017	2.5 - 3.0m	0.27	0.47	7.61	42	12	5.0	3.8	12	19	14	3.9	1.6	1.3	3.9	6.2	33
BIFP-17-7	26-Sep-2017	0.5 - 1.0m	0.39	0.45	7.52	64	14	3.6	5.1	14	89	29	6.3	1.6	2.3	6.3	40	45
	26-Sep-2017	1.5 - 2.0m	0.33	0.51	7.48	49	12	5.8	4.2	14	47	15	3.7	1.8	1.3	4.4	15	31
BIFP-17-8	26-Sep-2017	0.5 - 1.0m	0.49	0.40	7.46	76	13	11	12	14	140	35	6.1	5.0	5.6	6.5	63	46
	26-Sep-2017	1.0 - 1.5m	0.46	0.47	7.50	67	15	4.9	11	16	130	25	5.5	1.9	4.0	5.9	49	38
BIFP-17-9	26-Sep-2017	0.5 - 1.0m	0.80	0.36	7.39	130	11	7.4	18	16	310	72	6.1	4.2	10	9.4	180	57
	26-Sep-2017	1.5 - 2.0m	0.47	0.50	7.49	66	11	8.7	11	17	110	30	4.8	3.9	4.9	7.5	48	45
(Duplicate)	26-Sep-2017	1.5 - 2.0m	0.47	0.41	7.47	70	11	9.1	11	14	110	32	4.9	4.2	5.2	6.5	52	46
O-29X																		
O29X-17-1	27-Sep-2017	0.0 - 0.5m	1.2	0.39	7.76	240	32	8.8	27	24	620	62	8.3	2.3	7.2	6.2	160	26
	27-Sep-2017	1.0 - 1.5m	1.6	0.24	7.51	310	13	11	39	17	860	120	5.2	4.2	15	6.5	330	39
	27-Sep-2017	3.5 - 4.0m	0.86	0.52	7.81	130	30	8.6	16	24	320	36	8.4	2.4	4.3	6.6	90	28

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates detection limit below applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, 2007 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, 2007 and updates)
8. Superscript [#3] - Detection limits raised due to dilution to bring analyte within the calibrated range.

Advisian
WorleyParsons Group

Table 21
2017 Islands Sites Phase II ESA
Soil Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	General: % Moisture (%)	Petroleum Hydrocarbons (PHCs): Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Reached Baseline at C_{50} (none)
CCME Residential/Parkland Coarse Surface [#1]			---	1	0.1	50	37	---	---	---	---	---	---
CCME Residential/Parkland Coarse Sub-Surface [#2]			---	1	0.1	50	37	---	---	---	---	---	---
CCME Canada Wide Standards Surface [#3]			---	---	---	---	---	210	150	300	2800	2800	---
CCME Canada Wide Standards Sub-Surface [#5]			---	---	---	---	---	700	380	2500	10000	10000	---
BEAR ISLAND SUMP 6													
BIS6-17-1	26-Sep-2017	1.0 - 1.5m	29	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	53	< 50	---	YES
	26-Sep-2017	2.0 - 2.5m	26	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	10	71	< 50	---	YES
BIS6-17-2	26-Sep-2017	0.0 - 0.5m	38	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIS6-17-3	26-Sep-2017	0.5 - 1.0m	29	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	58	< 50	---	YES
	26-Sep-2017	1.5 - 2.0m	29	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	55	< 50	---	YES
BIS6-17-4	26-Sep-2017	0.0 - 0.5m	35	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	68	< 50	---	YES
BIS6-17-5	26-Sep-2017	0.5 - 1.0m	28	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	80	< 50	---	YES
	26-Sep-2017	2.5 - 3.0m	23	0.12	0.050	0.28	0.22 [#4]	43	600 [#3]	470 [#3]	86	---	YES
(Duplicate)	26-Sep-2017	2.5 - 3.0m	23	0.10	0.046	0.22	0.18 [#4]	78	200 [#3]	200	< 50	---	YES
	26-Sep-2017	3.0 - 3.5m	24	0.25	0.11 [#2]	0.96	0.94 [#4]	130	1200 [#5]	860	590	3200	NO
	26-Sep-2017	4.0 - 4.5m	27	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BEAR ISLAND BIBT1													
BIBT1-17-1	27-Sep-2017	0.0 - 1.0m	25	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	55	< 50	---	YES
	27-Sep-2017	1.5 - 2.0m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIBT1-17-2	27-Sep-2017	0.5 - 1.0m	26	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	50	< 50	---	YES
	27-Sep-2017	2.0 - 2.5m	19	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIBT1-17-3	27-Sep-2017	0.5 - 1.0m	16	0.048	< 0.020	< 0.010	< 0.040	< 10	12	180	54	---	YES
	27-Sep-2017	1.0 - 1.5m	25	9.0 [#1]	8.1 [#1]	5.8	23	190	45	81	< 50	---	YES
(Duplicate)	27-Sep-2017	1.0 - 1.5m	23	17 [#1]	23 [#1]	17	63 [#1]	1300 [#3]	1500 [#3]	2100 [#3]	590	---	YES
	27-Sep-2017	3.0 - 3.5m	24	16 [#2]	2.9 [#2]	8.5	33	1600 [#5]	770 [#5]	1100	300	---	YES
BIFP													
BIFP-17-1	25-Sep-2017	1.0 - 1.5m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	66	< 50	---	YES
	25-Sep-2017	4.5 - 5.0m	17	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	25-Sep-2017	5.5 - 6.0m	23	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIFP-17-2	25-Sep-2017	0.5 - 1.0m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	70	< 50	---	YES
BIFP-17-3	25-Sep-2017	1.0 - 1.5m	16	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	58	< 50	---	YES
	25-Sep-2017	4.0 - 4.5m	18	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	25-Sep-2017	5.0 - 5.5m	25	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIFP-17-4	25-Sep-2017	1.0 - 1.5m	23	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	25-Sep-2017	2.0 - 2.5m	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIFP-17-5	25-Sep-2017	0.5 - 1.0m	23	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	12	290	160	---	YES
	25-Sep-2017	1.5 - 2.0m	22	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	11	63	< 50	---	YES
BIFP-17-6	25-Sep-2017	0.5 - 1.0m	24	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	110	< 50	---	YES
	25-Sep-2017	2.5 - 3.0m	19	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIFP-17-7	26-Sep-2017	0.5 - 1.0m	24	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	57	< 50	---	YES
	26-Sep-2017	1.5 - 2.0m	20	< 0.0050	0.036	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIFP-17-8	26-Sep-2017	0.5 - 1.0m	27	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	100	< 50	---	YES
	26-Sep-2017	1.0 - 1.5m	19	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
BIFP-17-9	26-Sep-2017	1.0 - 1.5m	19	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
	26-Sep-2017	0.5 - 1.0m	29	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	130	< 50	---	YES
	26-Sep-2017	1.5 - 2.0m	26	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	79	< 50	---	YES
(Duplicate)	26-Sep-2017	1.5 - 2.0m	24	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	YES
O-29X													
O29X-17-1	27-Sep-2017	0.0 - 0.5m	8.4	0.20	0.20 [#1]	0.15	0.66	38	62	190	68	---	YES
	27-Sep-2017	1.0 - 1.5m	16	0.10	0.18 [#1]	0.26	0.73	130	210 [#3]	330 [#3]	89	---	YES
	27-Sep-2017	3.5 - 4.0m	12	0.040	0.075	0.059	0.24	37	81	190	64	---	YES

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates detection limit above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, 2007 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, 2007 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada Wide Standards, excluded Potable Groundwater and Vapour Inhalation Pathways 2008)
9. Superscript [#4] - Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
10. Superscript [#5] denotes values exceeding
    (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Coarse-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 22
2017 Island Sites Phase II ESA
Soil Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Boron - Hot Water Soluble (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			---	20	12	500	4	---	---	10	52	0.4	50	63	140	10	50	1	20	1	50	23	130	200
CCME Residential/Parkland Coarse Sub-Surface [#2]			---	20	12	500	4	---	---	10	52	0.4	50	63	140	10	50	1	20	1	50	23	130	200
BEAR ISLAND SUMP 6																								
BIS6-17-1	26-Sep-2017	1.0 - 1.5m	6900	0.62	8.2	330	0.46	4.5	0.17	0.55	14	< 0.080	8.4	19	9.4	2.0	26	0.66	< 0.20	0.16	< 1.0	0.93	25	86
	26-Sep-2017	2.0 - 2.5m	6000	0.60	8.0	270	< 0.40	3.9	0.16	0.60	13	< 0.080	7.5	17	8.6	2.1	23	0.66	< 0.20	0.14	< 1.0	0.99	23	81
BIS6-17-2	26-Sep-2017	0.0 - 0.5m	6300	0.63	8.0	350	0.43	4.4	0.24	0.60	14	< 0.080	8.0	18	9.7	2.1	25	0.67	< 0.20	0.16	< 1.0	0.96	23	87
BIS6-17-3	26-Sep-2017	0.5 - 1.0m	7800	0.69	9.1	360	0.52	5.1	0.2	0.62	16	< 0.080	11	21	10	2.2	28	0.71	< 0.20	0.17	< 1.0	1.0	26	89
	26-Sep-2017	1.5 - 2.0m	7300	0.65	8.8	320	0.48	6.2	0.32	0.65	15	< 0.080	9.0	20	9.9	2.1	27	0.71	< 0.20	0.16	< 1.0	1.0	25	91
BIS6-17-4	26-Sep-2017	0.0 - 0.5m	6600	0.53	7.5	290	0.43	7.0	0.27	0.76	13	< 0.080	8.0	19	9.0	1.9	25	0.66	< 0.20	0.15	< 1.0	0.85	23	84
BIS6-17-5	26-Sep-2017	0.5 - 1.0m	6100	0.61	8.0	270	0.40	4.0	0.16	0.51	14	< 0.080	8.3	17	8.7	2.1	24	0.58	< 0.20	0.13	< 1.0	0.92	22	81
	26-Sep-2017	2.5 - 3.0m	6700	0.72	8.7	**760** [#1]	0.43	3.8	0.2	0.60	17	< 0.080	9.4	19	23	2.4	28	0.64	< 0.20	0.16	< 1.0	1.2	24	100
(Duplicate)	26-Sep-2017	2.5 - 3.0m	6700	0.77	8.3	**810** [#1]	0.46	4.9	0.19	0.61	15	< 0.080	8.5	18	21	2.2	26	0.63	< 0.20	0.16	< 1.0	1.1	24	99
	26-Sep-2017	3.0 - 3.5m	6900	0.83	8.5	**1000** [#2]	0.43	4.8	0.3	0.57	17	< 0.080	8.9	21	48	2.4	28	0.67	< 0.20	0.19	< 1.0	0.95	24	120
	26-Sep-2017	4.0 - 4.5m	5600	0.60	7.6	310	< 0.40	3.6	0.16	0.52	13	< 0.080	7.6	17	9.6	1.8	23	0.57	< 0.20	0.14	< 1.0	0.91	21	80
BEAR ISLAND BIBT1																								
BIBT1-17-1	27-Sep-2017	0.0 - 1.0m	6900	0.58	8.1	290	0.43	4.0	< 0.10	0.59	15	< 0.080	9.2	20	9.6	1.9	27	0.62	< 0.20	0.14	< 1.0	0.87	**24** [#3]	93
	27-Sep-2017	1.5 - 2.0m	6200	0.58	7.6	220	0.41	3.6	0.16	0.56	13	< 0.080	8.1	17	8.5	1.8	24	0.59	< 0.20	0.13	< 1.0	0.87	22	81
BIBT1-17-2	27-Sep-2017	0.5 - 1.0m	6500	0.57	7.8	270	0.42	3.6	0.13	0.58	14	< 0.080	8.5	18	8.7	1.9	25	0.57	< 0.20	0.13	< 1.0	0.91	22	86
	27-Sep-2017	2.0 - 2.5m	3700	< 0.50	5.7	150	< 0.40	2.1	< 0.10	0.34	8.8	< 0.080	5.9	9.8	6.2	1.4	17	< 0.50	< 0.20	< 0.10	< 1.0	0.68	15	60
BIBT1-17-3	27-Sep-2017	0.5 - 1.0m	6100	0.61	7.6	270	0.41	4.2	0.23	0.59	13	< 0.080	8.0	17	8.6	1.8	24	0.58	< 0.20	0.14	< 1.0	0.89	22	79
	27-Sep-2017	1.0 - 1.5m	6900	0.69	9.0	330	0.48	4.3	< 0.10	0.56	15	< 0.080	9.2	21	11	2.2	29	0.70	< 0.20	0.17	< 1.0	0.98	25	89
(Duplicate)	27-Sep-2017	1.0 - 1.5m	7100	0.71	9.2	350	0.52	4.3	0.24	0.61	16	< 0.080	9.2	21	11	2.2	29	0.72	< 0.20	0.17	< 1.0	1.0	27	92
	27-Sep-2017	3.0 - 3.5m	4100	< 0.50	6.4	190	< 0.40	2.7	< 0.10	0.41	10	< 0.080	6.5	12	6.5	1.7	20	< 0.50	< 0.20	< 0.10	< 1.0	0.78	18	63
BIFP																								
BIFP-17-1	25-Sep-2017	1.0 - 1.5m	6500	0.58	7.6	300	0.44	4.5	0.14	0.59	14	< 0.080	8.1	17	8.6	1.9	24	0.59	< 0.20	0.15	< 1.0	0.90	23	90
	25-Sep-2017	4.5 - 5.0m	5400	0.52	7.3	220	< 0.40	3.1	< 0.10	0.43	12	< 0.080	7.5	15	8.5	1.8	22	< 0.50	< 0.20	0.11	< 1.0	0.80	21	73
	25-Sep-2017	5.5 - 6.0m	3900	< 0.50	6.2	180	< 0.40	2.4	< 0.10	0.44	9.9	< 0.080	6.0	11	6.5	1.6	18	< 0.50	< 0.20	< 0.10	< 1.0	0.78	17	61
BIFP-17-2	25-Sep-2017	0.5 - 1.0m	6000	0.62	7.4	290	< 0.40	3.8	< 0.10	0.50	13	< 0.080	7.5	16	8.3	1.9	23	0.56	< 0.20	0.13	< 1.0	0.92	**22** [#3]	75

Advisian
WorleyParsons Group

Table 22
2017 Island Sites Phase II ESA
Soil Analytical Results: Total Metals and Trace Elements

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Boron - Hot Water Soluble (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			---	20	12	500	4	---	---	10	52	0.4	50	63	140	10	50	1	20	1	50	23	130	200
CCME Residential/Parkland Coarse Sub-Surface [#2]			---	20	12	500	4	---	---	10	52	0.4	50	63	140	10	50	1	20	1	50	23	130	200
BIFP-17-3	25-Sep-2017	1.0 - 1.5m	6200	0.59	7.4	270	0.42	4.2	0.15	0.52	13	< 0.080	7.4	16	8.2	1.9	23	0.61	< 0.20	0.13	< 1.0	0.97	22	77
	25-Sep-2017	4.0 - 4.5m	5100	0.54	6.9	210	< 0.40	3.2	< 0.10	0.50	11	< 0.080	7.1	14	7.5	1.9	21	0.53	< 0.20	0.12	< 1.0	0.94	21	71
	25-Sep-2017	5.0 - 5.5m	4100	< 0.50	6.2	170	< 0.40	2.3	< 0.10	0.39	11	< 0.080	6.4	9.9	6.1	1.7	18	< 0.50	< 0.20	< 0.10	< 1.0	0.82	18	61
BIFP-17-4	25-Sep-2017	1.0 - 1.5m	5700	0.54	7.6	240	< 0.40	3.1	0.1	0.48	13	< 0.080	7.9	16	8.4	1.8	23	0.56	< 0.20	0.12	< 1.0	0.81	21	74
	25-Sep-2017	2.0 - 2.5m	4000	< 0.50	5.3	140	< 0.40	2.2	< 0.10	0.36	8.9	< 0.080	5.8	10	5.7	1.4	17	< 0.50	< 0.20	< 0.10	< 1.0	0.66	16	58
BIFP-17-5	25-Sep-2017	0.5 - 1.0m	6300	0.54	7.4	300	0.43	4.1	0.11	0.48	14	< 0.080	7.9	17	8.5	1.8	24	0.54	< 0.20	0.13	< 1.0	0.83	23	76
	25-Sep-2017	1.5 - 2.0m	6500	0.62	8.3	300	0.44	3.4	< 0.10	0.56	14	< 0.080	8.5	18	9.3	2.0	25	0.58	< 0.20	0.13	< 1.0	0.89	23	83
BIFP-17-6	25-Sep-2017	0.5 - 1.0m	6200	0.54	7.4	280	0.40	3.7	0.11	0.54	13	< 0.080	7.8	17	8.6	1.8	23	0.54	< 0.20	0.13	< 1.0	0.83	21	80
	25-Sep-2017	2.5 - 3.0m	3800	< 0.50	6.0	160	< 0.40	2.1	< 0.10	0.33	9.0	< 0.080	6.1	9.4	5.9	1.5	17	< 0.50	< 0.20	< 0.10	< 1.0	0.75	16	56
BIFP-17-7	26-Sep-2017	0.5 - 1.0m	6300	0.56	8.1	300	0.43	3.4	< 0.10	0.46	13	< 0.080	8.2	18	9.0	1.9	24	0.59	< 0.20	0.13	< 1.0	0.85	22	80
	26-Sep-2017	1.5 - 2.0m	4300	< 0.50	5.8	170	< 0.40	2.7	< 0.10	0.37	9.7	< 0.080	6.2	11	6.3	1.5	18	< 0.50	< 0.20	< 0.10	< 1.0	0.68	17	56
BIFP-17-8	26-Sep-2017	0.5 - 1.0m	6200	0.63	7.9	290	0.44	3.9	< 0.10	0.51	14	< 0.080	8.3	18	9.6	1.9	25	0.62	< 0.20	0.14	< 1.0	0.90	23	82
	26-Sep-2017	1.0 - 1.5m	6000	< 0.50	7.1	230	0.40	3.8	< 0.10	0.43	13	< 0.080	7.7	15	8.2	1.7	23	0.53	< 0.20	0.13	< 1.0	0.80	21	73
BIFP-17-9	26-Sep-2017	0.5 - 1.0m	7500	0.67	8.5	350	0.51	4.6	0.17	0.66	15	< 0.080	9.3	20	10	1.5	28	0.75	< 0.20	0.15	< 1.0	0.99	25	91
	26-Sep-2017	1.5 - 2.0m	6500	0.63	7.8	320	0.44	4.1	0.19	0.61	14	< 0.080	8.3	18	9.0	2.1	25	0.62	< 0.20	0.14	< 1.0	0.95	23	85
(Duplicate)	26-Sep-2017	1.5 - 2.0m	6500	0.64	8.3	300	0.44	3.8	0.12	0.56	14	< 0.080	8.2	18	9.1	2.1	25	0.60	< 0.20	0.14	< 1.0	0.90	23	83
O-29X																								
O29X-17-1	27-Sep-2017	0.0 - 0.5m	2100	< 0.50	4.0	100	< 0.40	1.5	< 0.10	0.32	7.5	< 0.080	3.9	7.6	3.6	3.4	15	0.58	< 0.20	0.17	< 1.0	1.2	13	41
	27-Sep-2017	1.0 - 1.5m	4800	0.86	9.1	160	0.44	3.2	< 0.10	1.1	15	< 0.080	12	23	8.3	**13** [#1]	**54** [#1]	**1.7** [#1]	< 0.20	0.73	< 1.0	3.5	26	160
	27-Sep-2017	3.5 - 4.0m	2500	< 0.50	4.1	110	< 0.40	1.9	< 0.10	0.32	11	< 0.080	4.3	8.6	3.9	3.9	18	0.57	< 0.20	0.21	< 1.0	1.3	13	46

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates detection limit above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, 2007 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, 2007 and updates)
8. Superscript [#3] - Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.

Advisian
WorleyParsons Group

Table 23
2017 Islands Sites Phase II ESA
Soil Analytical Results: Polycyclic Aromatic Hydrocarbons (PAHs)

PROJECT No.: 407011-00622-300

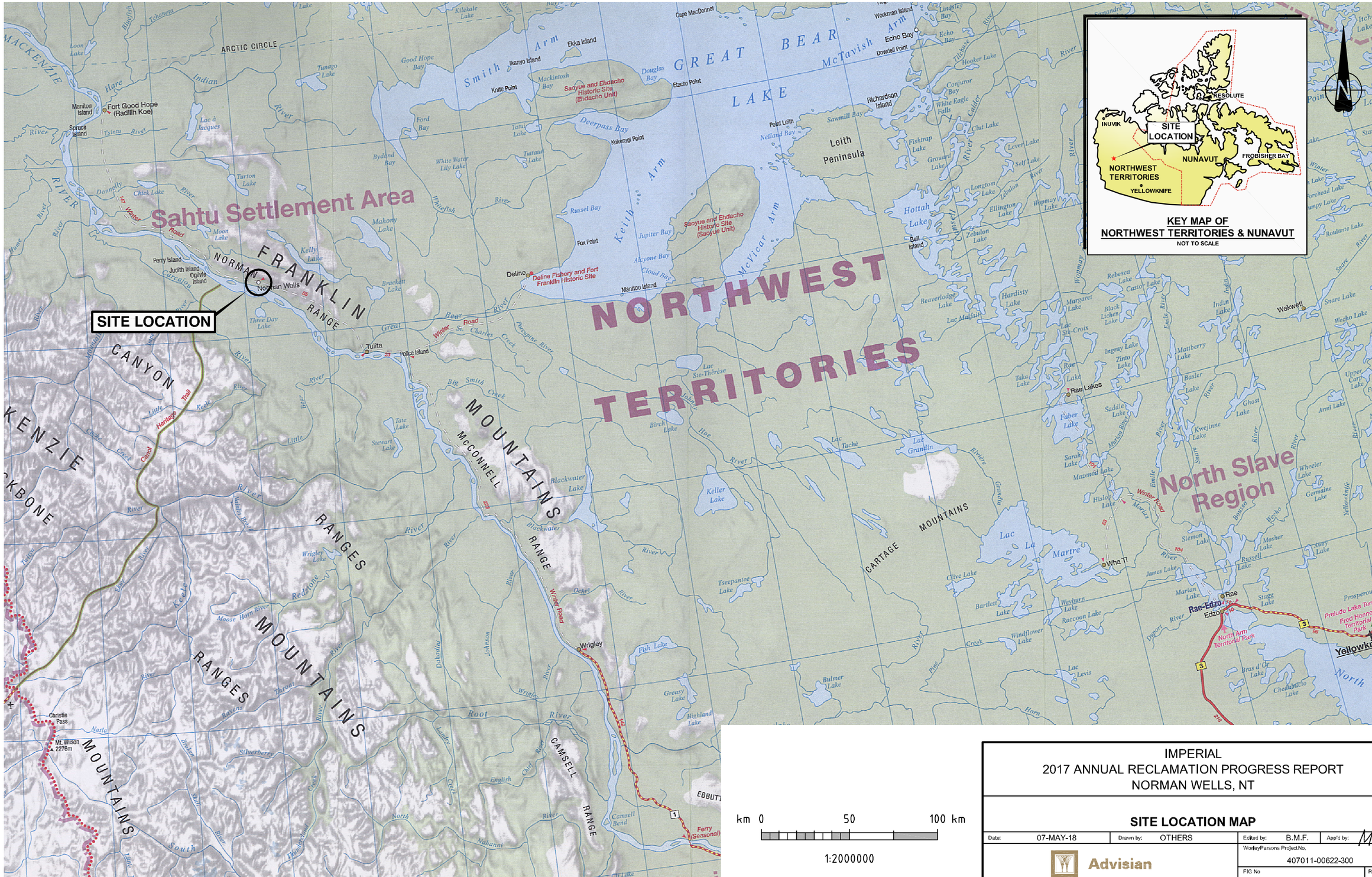
Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Acridine (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(b,j)Fluoranthene (mg/kg)	Benzo(c)Phenanthrene (mg/kg)	Benzo(e)Pyrene (mg/kg)	Benzo(g,h,i)Perylene (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	2-Methylnaphthalene (mg/kg)	Naphthalene (mg/kg)	Perylene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Quinoline (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			**0.28**	**320**	**---**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**7.7**	**---**
CCME Residential/Parkland Coarse Sub-Surface [#2]			**0.28**	**320**	**---**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**---**	**---**	**---**	**---**	**---**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**---**	**---**	**1**	**---**	**0.013**	**---**	**0.046**	**7.7**	**---**
BIFP																															
BIFP-17-2	25-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0076	0.0076	0.015	< 0.0050	0.022	0.024	< 0.0050	0.0071	< 0.0050	0.0061	< 0.0050	< 0.0050	0.043	0.022	0.14	0.020	0.011	0.067	0.019	0.011	< 0.010
BIFP-17-3	25-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0074	0.0074	0.014	< 0.0050	0.019	0.021	< 0.0050	0.0069	< 0.0050	0.0062	< 0.0050	< 0.0050	0.041	0.022	0.14	0.020	0.011	0.066	0.019	0.012	< 0.010
	25-Sep-2017	4.0 - 4.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0071	0.0071	0.012	< 0.0050	0.016	0.016	< 0.0050	< 0.0050	< 0.0050	0.0051	< 0.0050	< 0.0050	0.038	0.020	0.12	0.015	0.0077	0.053	0.017	0.0099	< 0.010
	25-Sep-2017	5.0 - 5.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0065	0.0065	0.0067	< 0.0050	0.010	0.0076	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.031	0.016	0.086	0.0082	< 0.0050	0.022	0.011	0.0056	< 0.010
BIFP-17-4	25-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0055	0.011	0.011	0.011	0.018	< 0.0050	0.024	0.025	< 0.0050	0.0075	< 0.0050	0.0083	< 0.0050	0.0057	0.049	0.026	0.17	0.024	**0.013** [#1]	0.093	0.025	0.015	< 0.010
	25-Sep-2017	2.0 - 2.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0061	0.0061	< 0.0050	< 0.0050	0.0063	0.0053	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.025	0.013	0.059	0.0057	< 0.0050	0.018	0.0068	< 0.0050	< 0.010
BIFP-17-5	25-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0081	0.0081	0.016	< 0.0050	0.029	0.029	< 0.0050	0.0087	< 0.0050	0.0073	< 0.0050	0.0065	0.045	0.023	0.15	0.027	0.012	0.075	0.022	0.016	< 0.010
	25-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	0.0053	0.0073	0.014	0.014	0.014	0.024	< 0.0050	0.033	0.036	< 0.0050	0.013	< 0.0050	0.012	< 0.0050	0.0075	0.061	0.032	0.23	0.032	**0.015** [#1]	0.13	0.034	0.021	< 0.010
BIFP-17-6	25-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0054	0.011	0.011	0.011	0.019	< 0.0050	0.028	0.030	< 0.0050	0.0089	< 0.0050	0.0075	< 0.0050	0.0071	0.051	0.026	0.18	0.024	0.012	0.085	0.024	0.015	< 0.010
	25-Sep-2017	2.5 - 3.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0065	0.0065	0.0061	< 0.0050	0.0092	0.0082	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.030	0.016	0.082	0.0077	< 0.0050	0.025	0.0099	0.0057	< 0.010
BIFP-17-7	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0074	0.014	0.014	0.014	0.024	< 0.0050	0.035	0.036	< 0.0050	0.011	< 0.0050	0.010	0.0054	0.0073	0.059	0.031	0.22	0.044	**0.024** [#1]	0.11	0.038	0.019	< 0.010
	26-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0068	0.0068	0.0087	< 0.0050	0.012	0.011	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.033	0.017	0.099	0.019	**0.013** [#1]	0.037	0.015	0.0070	< 0.010
BIFP-17-8	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0063	0.012	0.012	0.012	0.020	< 0.0050	0.029	0.029	< 0.0050	0.0098	< 0.0050	0.0090	0.0050	0.0057	0.053	0.027	0.19	0.039	**0.021** [#1]	0.099	0.033	0.016	< 0.010
	26-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0058	0.012	0.012	0.012	0.017	< 0.0050	0.026	0.026	< 0.0050	0.0092	< 0.0050	0.0078	< 0.0050	0.0074	0.048	0.025	0.17	0.039	**0.023** [#1]	0.092	0.029	0.015	< 0.010
BIFP-17-9	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0061	0.012	0.012	0.012	0.020	< 0.0050	0.030	0.028	< 0.0050	0.010	< 0.0050	0.0094	0.0070	0.0061	0.052	0.027	0.19	0.040	**0.021** [#1]	0.10	0.036	0.017	< 0.010
	26-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0054	0.011	0.011	0.011	0.019	< 0.0050	0.028	0.025	< 0.0050	0.010	< 0.0050	0.0084	0.0055	0.0054	0.051	0.026	0.18	0.035	**0.018** [#1]	0.095	0.032	0.015	< 0.010
(Duplicate)	26-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.0050	< 0.010	< 0.0040	< 0.0050	0.0054	0.011	0.011	0.011	0.017	< 0.0050	0.025	0.024	< 0.0050	0.0087	< 0.0050	0.0079	< 0.0050	< 0.0050	0.047	0.025	0.16	0.032	**0.016** [#1]	0.092	0.029	0.015	< 0.010

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates detection limit above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, 2007 and updates)
12. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, 2007 and updates)

Figures





SCANNING SOURCE: MAPART PUBLISHING, 2002 EDITION

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

SITE LOCATION MAP

Date: 07-MAY-18	Drawn by: OTHERS	Edited by: B.M.F.	App'd by: MB
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-300	
		FIG No 1	REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-ROADMAP.DWG

PLOT DATE & TIME: 7/5/2018 4:04:10 PM
SAVE DATE & TIME: 7/5/2018 2:22:08 PM
USER NAME: blair.tink
ISSUING OFFICE: CALGARY

MAINLAND SUMPS

MAINLAND CENTRAL

MAINLAND WEST

MAINLAND EAST

SEEPAGE LAKE

NORMAN WELLS AIRSTRIP

MACKENZIE RIVER

GOOSE ISLAND

BEAR ISLAND

FRENCHY'S ISLAND

SANDBAR

LEASE No. 96 E/7-29

LEASE No. 76 E/7-16

LEASE No. 96 E/7-26-4

LEASE No. L-2825T

LEASE No. L-2824T

LEASE No. L-3175T

LOT 8 REMAINDER GROUP 1158
PLAN 52019 C.L.S.R.

PLAN 69807 C.L.S.R. (L.T.O. No. 1732)
LOT 1007 LEASE No. 96 E/7-15-2
ISLAND 5 (ITEH K'EE)

PRODUCING WELLS	INJECTION WELLS
W-31X K-36X	J-31X L-33X
W-32X K-37X	J-32X L-34X
W-34X I-32X	J-35X L-35X
W-35X I-34X	J-36X L-36X
K-32X I-35X	L-37X
K-33X	
K-34X	

PLAN 69807 C.L.S.R. (L.T.O. No. 1732)
LOT 1008 LEASE No. 96 E/7-14-2
ISLAND 6 (LITTLE BEAR)

PRODUCING WELLS	INJECTION WELLS
I-40X K-40X	J-37X J-43X
I-42X K-42X	J-38X L-30X
K-38X M-40X	J-41X L-41X

ISLAND 3 (DEHCHO)

PRODUCING WELLS	INJECTION WELLS
I-22X K-24X	J-19X L-19X
I-24X M-18X	J-21X L-21X
K-17X M-20X	J-23X L-23X
K-20X M-22X	
K-22X M-24X	

ISLAND 4 (EKWE)

PRODUCING WELLS	INJECTION WELLS
I-26X K-28X	I-29-1X L-25X
I-28X K-30X	J-25X L-27X
I-30X M-26X	J-27X L-29X
K-26X M-28X	J-29-1X L-31X
M-30X	

ISLAND 1 (RAYUKA)

PRODUCING WELLS	INJECTION WELLS
G-34X G-40X	F-37X H-35X
G-36X I-36X	F-39X H-37X
G-38X I-38X	H-33X H-39X

ISLAND 2 (RAMPART)

PRODUCING WELLS	INJECTION WELLS
E-42X G-46X	F-41X H-43X
E-44X G-48X	F-43X H-45X
E-46X I-44X	F-45X H-47X
E-48X I-46X	F-47X H-49X
E-50X I-48X	H-41X
F-52X (PROPOSED)	H-51X (PROPOSED)

LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- ESSO LEASE BOUNDARY
- UTILIDOR LOCATION
- PIPELINE R/W
- O/H POWERLINE
- LEASE BOUNDARY (O.H.W.M.)
- REGISTERED PLAN BOUNDARY
- SITE SUB-AREA
- CSM AREA
- ADDITIONAL AREAS MANAGED BY IES

CSM LEGEND AND CONCORDANCE

1. BATTERY #3 FLARE PIT - APPENDIX 5
2. REFINERY BANK - APPENDIX 6
3. B-38X AREA - APPENDIX 7
4. MAINLAND SUMPS - APPENDIX 8
5. BEAR ISLAND BT1 - APPENDIX 9
6. BEAR ISLAND SUMPS - APPENDIX 10
7. BEAR ISLAND FLARE PIT - APPENDIX 11

SOURCE:
SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)

UTM NAD27

m 0 100 200 300 400 500 m

1:10000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

SITE LAYOUT

Date:	Drawn by:	Edited by:	Appr'd by:
14-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622-300

FIG No.: 2 REV.: B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: I:\GAL\GB\01\0701\406222\006\dc\WMAB REPORTS\12_FIGURES_&_MAPS\11_C_CAD_FILES\00220x300x594\fig2x2x1594TEPLAN.DWG



LEGEND

SITE SUB-AREA

SOURCES:
1. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND WEST AREAS

Date:	07-MAY-18	Drawn by:	OTHERS	Edited by:	B.M.F.	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Projection: 407011-00622-300

FIG No: 3A REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CALGARY\407011\00622\00\DRAWINGS\REPORT\1A_FIGURES_MAPS\1A_CAD_FILES\00622\00\00622-00\MAINLAND WEST.DWG

PLOT DATE & TIME: 10/20/2018 1:42:17 PM USER: VANCHUR JAN
SAVE DATE & TIME: 10/20/2018 1:03:44 PM BEGUN: OTHERS ACAD



LEGEND

- SITE SUB-AREA
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL LOCATION
- OTHER MONITORING WELL LOCATION
- OTHER SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2016.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND WEST - 2017 GROUNDWATER MONITORING

Date:	Drawn by:	Edited by:	App'd by:
07-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

Worley Parsons Project No. 407011-00622-300

FIG No. 3B REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLANDCENTRAL.DWG

PLOT DATE & TIME: 10/5/2018 3:07:50 PM
SAVE DATE & TIME: 10/5/2018 2:19:57 PM
USER NAME: Blair.Fink
ISSUING OFFICE: eCAD



LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 5)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 250 m

1:5000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND CENTRAL AREAS

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

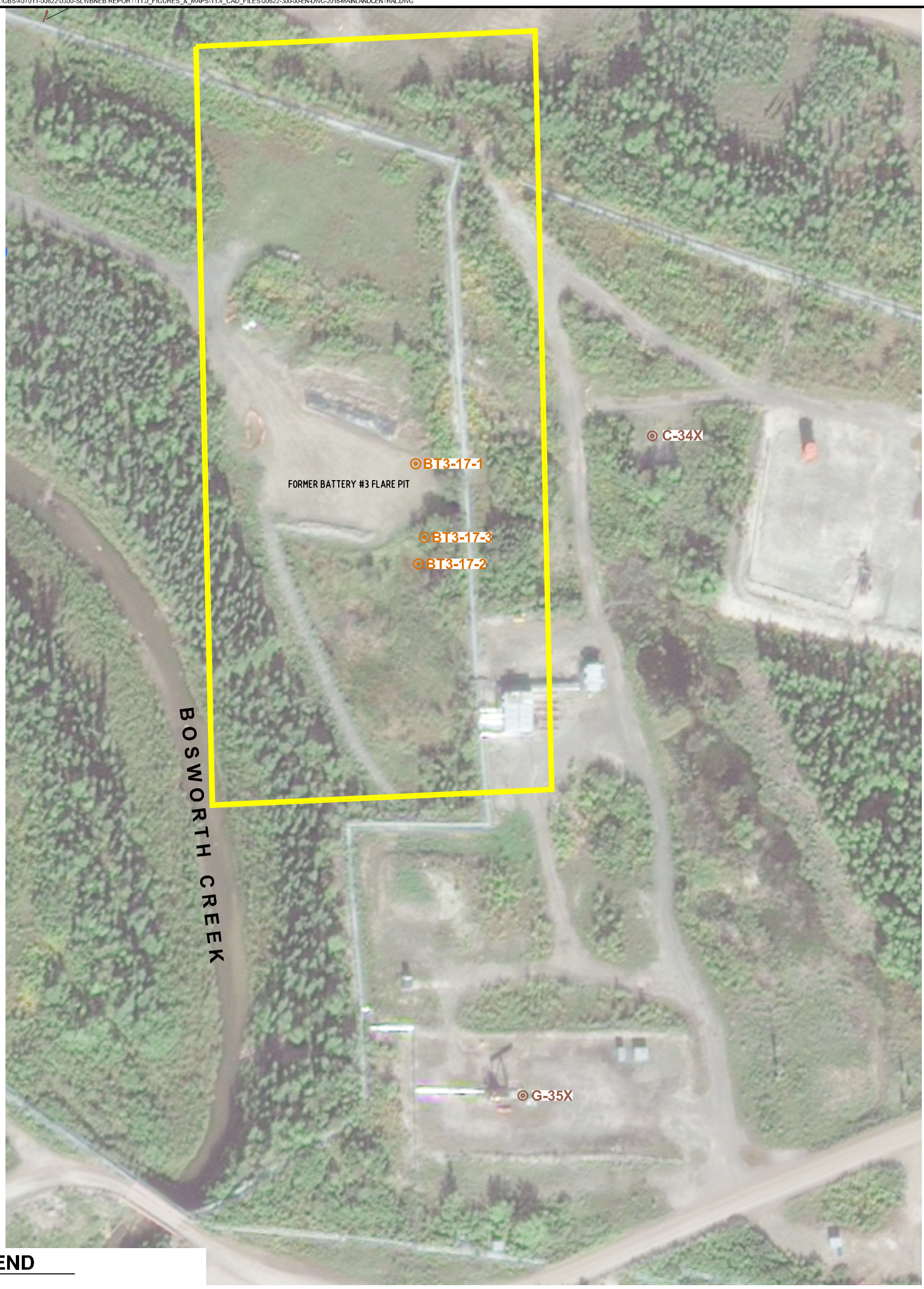
WorleyParsons Project No.
407011-00622-300

FIG No: 4A
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLANDCENTRAL.DWG

PLOT DATE & TIME: 10/5/2018 3:12:00 PM
SAVE DATE & TIME: 10/5/2018 2:19:57 PM
USER NAME: Blair.Fink
ISSUING OFFICE: eCAD



LEGEND

- PRODUCTION WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)
- CSM AREA (SEE APPENDIX 5)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 25 50 75 m

1:1250

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND CENTRAL - 2017 PHASE II ESA (BATTERY #3 FLARE PIT)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

FIG No: 4B
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WPC_B_Envir



LEGEND

- PRODUCTION WELL LOCATION
- FORMER INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- SOIL SAMPLE LOCATION (APPROXIMATE)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 10 20 30 40 50 m

1:1000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND CENTRAL - 2017 PHASE II ESA (BIOCELLS)

Date: 08-MAY-18	Drawn by: OTHERS	Edited by: B.M.F.	App'd by: MB
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-300	
		FIG No 4C	REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 10/5/2018 2:14:08 PM USER NAME: blair.fink
SAVE DATE & TIME: 10/5/2018 2:09:18 PM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLANDCENTRAL.DWG



LEGEND

- FORMER PRODUCTION WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 10 20 30 40 50 m

1:1000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND CENTRAL - 2017 PHASE II ESA (E-33X WELL SITE)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

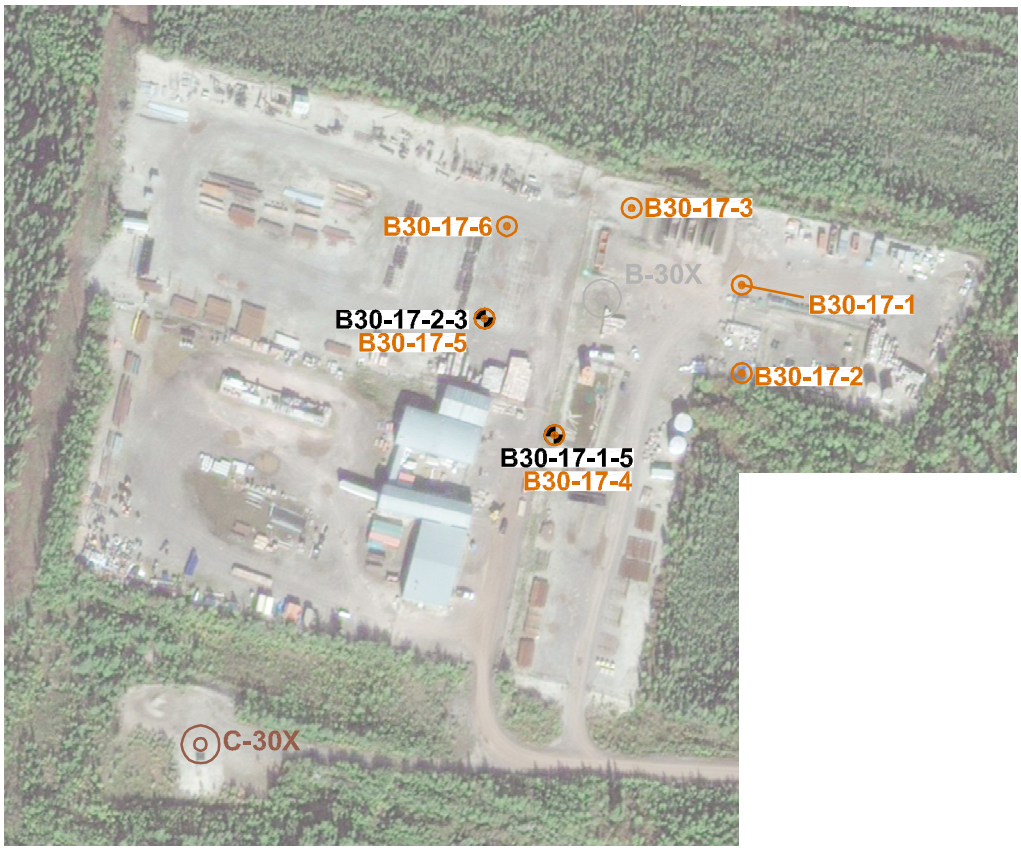
WorleyParsons Project No.
407011-00622-300

FIG No: 4D
REV: A

*This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

USER NAME: blair.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 10/5/2018 4:14:29 PM
SAVE DATE & TIME: 10/5/2018 2:19:57 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLANDCENTRAL.DWG



LEGEND

- FORMER INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND CENTRAL - 2017 PHASE II ESA (B-30X WELL SITE)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

FIG No 4E | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blair.fink
ISSUING OFFICE: CALGARY
PLOT DATE & TIME: 10/5/2018 2:16:24 PM
SAVE DATE & TIME: 10/5/2018 2:09:18 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLANDCENTRAL.DWG

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLANDCENTRAL.DWG

PLOT DATE & TIME: 10/5/2018 4:12:04 PM
SAVE DATE & TIME: 10/5/2018 2:19:57 PM
USER NAME: Blair.Fink
ISSUING OFFICE: eCAD

MCBG-12-1-2
CPF97-9-4
B30-13-4-3.9
B30-13-3-4.5
B30X-12-2-4
B-30X
WELL SERVICES YARD
B30-13-2-4.5
B30X-12-1-4
B-30X WELL SITE
B30-17-2-3
HAZARDOUS WASTE STORAGE
WSY 97-2-4
WSY 97-1-5
MCBG-10-1-3
OPB 09-2-4
OPB 09-3-4
BC2-15-1-3
ARB-12-3-3
B30-17-1-5
B30-13-5-4.5
ARB-10-2-3
BC2-15-2-4
BIOCELL 1
BIOCELL 2
ARB-17-1-3
ARB-13-1-4.5
ARB-13-3-4.5
ARB-12-1-4
B-33X
ARB SW01
B30-13-1-5.4
ARB-12-4-2
BC2-15-3-4
B33-10-1-3
SOIL TREATMENT CELL
ARB-17-SW02
ARB-17-2-3
ARB-17-3-5
ARB-16-1-3
C-30X
ARB-17-SW01
ARB-13-4-2.7
C30-10-1-5
ARB-13-5-4.5
BC2-15-4-3
ARB-13-7-SW
C-32X
ARB-10-1-3
BT300-28-44
BT300-29-22
BT3-10-1-3
BT3-10-2-3
C30 98-3-21
BOS SW01
BOS-DP-13-1-1.4
BOS DP 08-3
BOS SW-13-1
C-34X
FORMER BATTERY #3 FLARE PIT
BOSWORTH CREEK
BT3 99-23-13
BOS-DP-13-2-1.35
BOS 99-2-13
BT3 02-33-4
BT3-12-1-3
C-34-1X
BT3 SW01
D32 09-2-13
D32 09-1-4
BT3 99-21-12
D-31X
C-31X
FORMER TANK STORAGE (TANK 53)
D-32X
BT3 02-32-6
LT11 08-1-4
BT3 99-20-13
BOS-DP-13-3-2
BOS98 3-8-2
BOS DP 08-2
FORMER TANK STORAGE (TANK 401)
BT3 98-17-3
F31 98-1-4
F31 00-5-4
BT300 30 29
BT3 97 2-5
BT3-12-2-7
F31 97-3-5
BOS-DP-13-4-3
BT3 02-34-4
J-29X
E-32-1X
BT3 99-12-20
BT3 02-35-4
G-35X
F-31X
G-32X
BT3 97-10-8
BT3 02-36-4
F31 02-4-5
BT3 02-1-4
BOS DP98-3
G32 09-2-15
G32 09-1-4
BT3 97-11-11
BT3 99-6-13
MCBG-16-5-4
BT3 98-7-7
BT3 98-5-8
D-36X
F-33X
G32-10-1-3

LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 5)
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- FORMER INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- OTHER MONITORING WELL LOCATION
- 2017 SURFACE WATER SAMPLE LOCATION
- OTHER SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND CENTRAL -
2017 GROUNDWATER AND SURFACE WATER MONITORING

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

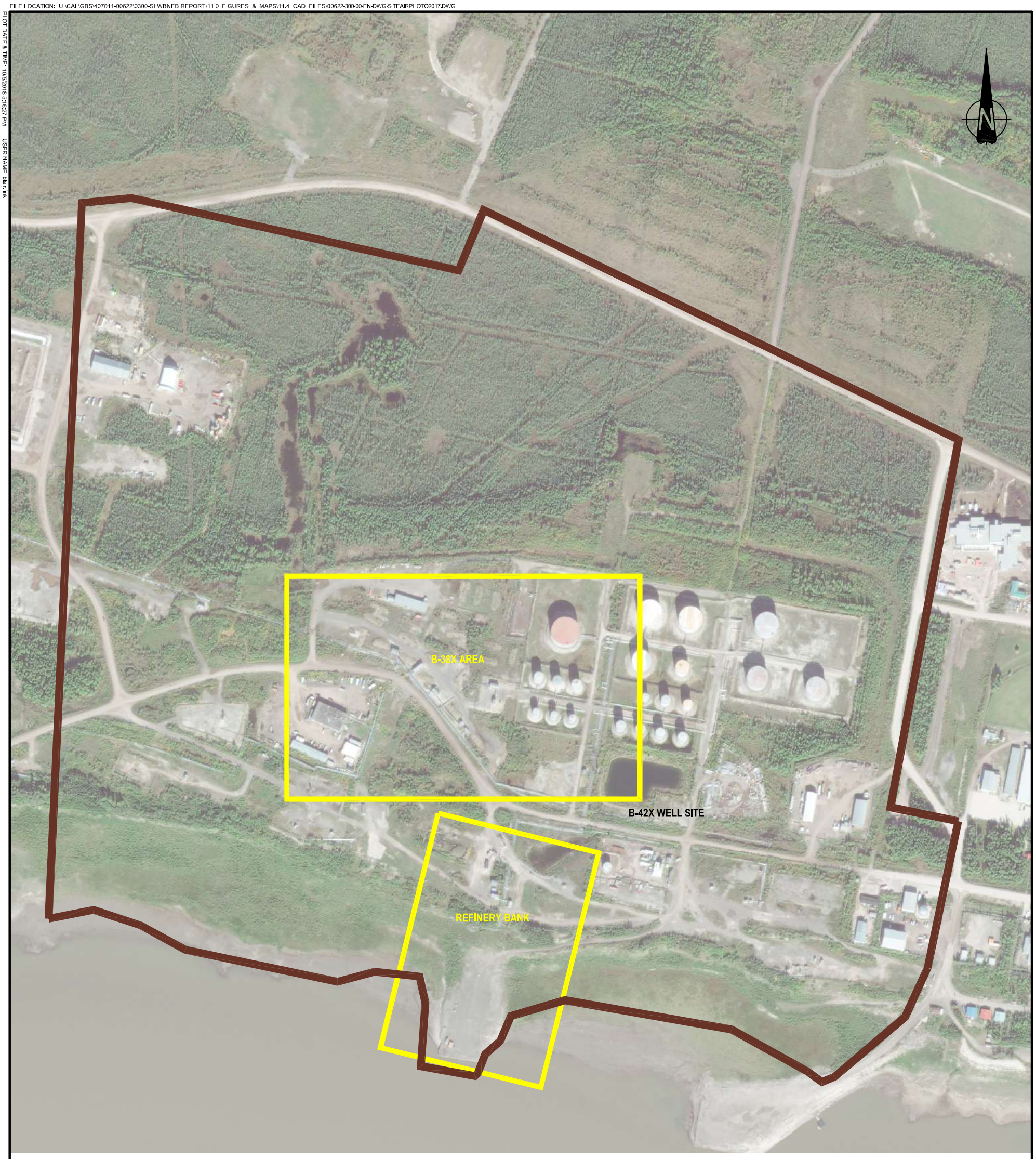
WorleyParsons Project No.
407011-00622-300

FIG No: 4F
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-SITEAIRPHOTO2017.DWG

PLOT DATE & TIME: 10/5/2018 5:16:27 PM
SAVE DATE & TIME: 9/5/2018 4:09:13 PM
USER NAME: Blair Rink
ISSUING OFFICE: eCAD



LEGEND

SITE SUB-AREA

CSM AREA (SEE APPENDIX 6 AND 7)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 250 m

1:5000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND EAST AREAS

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-300

FIG No 5A | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WPC_B_Enviro

RB-MW17-11
RB-MW17-10
RB-MW17-09
RB-MW17-08
RB-MW17-07
RB-MW17-06
RB-MW17-05
RB-MW17-04
RB-MW17-03
RB-MW17-02
RB-MW17-01
C-41X
REFINERY BANK
FUEL LOADING DOCK

LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 6)
- INJECTION WELL LOCATION
- MONITORING WELL LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 10 20 30 40 m

1:750

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND EAST - 2017 REFINERY BANK WELL INSTALLATIONS

Date:	Drawn by:	Edited by:	App'd by:
07-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-300

FIG No 5B | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 10/5/2018 9:36:05 PM
SAVE DATE & TIME: 9/5/2018 8:14:47 PM
USER NAME: bbirch
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWSNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLAND.DWG



LEGEND

- FORMER PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)

SOURCES:

1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 5 10 15 20 25 m

1:500

IMPERIAL

2017 ANNUAL RECLAMATION PROGRESS REPORT

NORMAN WELLS, NT

MAINLAND EAST - 2017 PHASE II ESA (B-42X WELL SITE)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

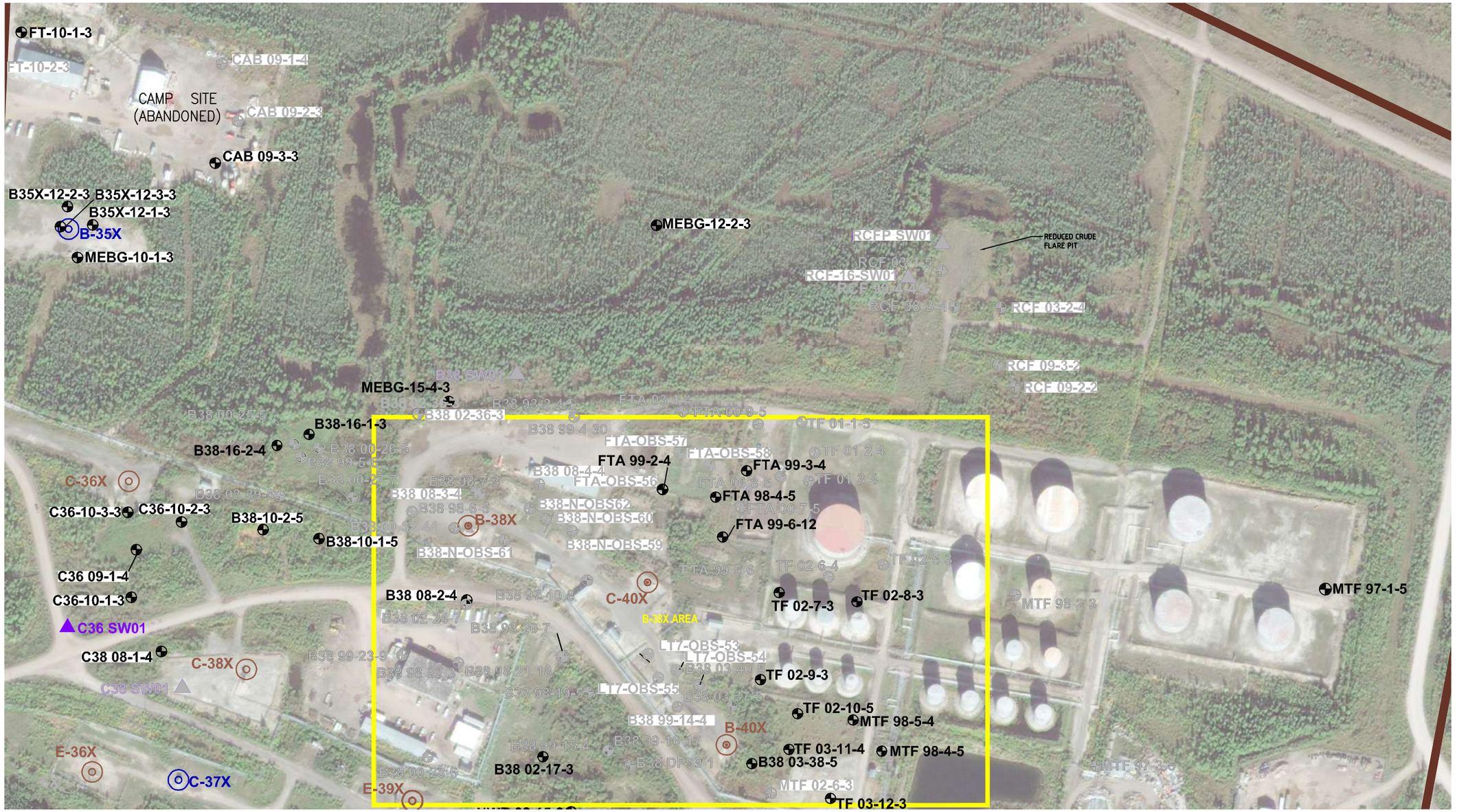
FIG No: 5C

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blair.fink
ISSUING OFFICE: CALGARY
PLOT DATE & TIME: 10/5/2018 4:24:38 PM
SAVE DATE & TIME: 10/5/2018 4:29:34 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-B42X.DWG



LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 7)
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- 2017 SURFACE WATER SAMPLE LOCATION
- OTHER MONITORING WELL LOCATION
- OTHER SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

NORTH MAINLAND EAST -
2017 GROUNDWATER AND SURFACE WATER MONITORING

Date:	08-MAY-18	Drawn by:	OTHERS	Edited by:	B.M.F.	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-300

FIG No 5D | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CALGBS\407011-00622\0300-SLWSNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00822-300-00-EN-DWG-2018_MAINLANDEAST.DWG

PLOT DATE & TIME: 10/5/2018 #5958 PM
SAVE DATE & TIME: 10/5/2018 #4824 PM
USER NAME: bfehr
ISSUING OFFICE: CALGARY

FORMER TANKS
FORMER REFINERY
FORMER TANKS
NWR-OBS33
NWR-OBS34
NWR98-13-21
PIPELINES
NWR-09-3-20
NWR-OBS37
FORMER FLARE PIT
FORMER API SEPARATOR
NWR 93-9-7
FORMER TANKS
NWR02-12-7
NWR03-41-17
NWR-09-4-17
NWR-09-2-26
FORMER PORTCO DRUM FILLING BLDG
NWR03-43-20
NWR03-42-19
RB-OBS30
RB-OBS38
RB-OBS28
NWR-09-1-20
NWR01-29-7
RB-RW
RB-OBS29
RB-RW-7
RB-OBS35
NWR93-10-6
NWR-09-4-5
RB-RW-10
NWR98-23-21
RB-OBS36
RB-OBS39
NWR-09-5-19
RB-OBS49
RB-RW-11
RB-OBS48
RB-RW-14
RB-OBS50
RB-RW-08
RB-RW-1
RB-OBS42
RB-OBS32
C-41X
RB-MW17-11
RB-RW-09
RB-OBS46
RB-OBS45
RB-OBS44
RB-RW-5
RB-RW-6
RB-MW17-10
RB-OBS52
RB-OBS47
RB-RW-3
RB-RW-12
RB-RW-4
RB-RW-13
RB-MW17-09
RB-13-3-2.4
RB-MW17-08
RB-13-5-2.4
RB-MW17-07
RB-OBS40
RB-MW17-06
RB-MW17-04
RB-MW17-05
RB-MW17-03
RB-MW17-02
RB-MW17-01
RB-13-1-2.4
RB-13-2-2.4
REFINERY BANK
RB-13-7-1.5
FUEL LOADING DOCK
RB-13-6-2.4
RB-13-8-1.5

LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 6)
- INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 10 20 30 40 m

1:750

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

REFINERY BANK (MAINLAND EAST) -
2017 GROUNDWATER AND SURFACE WATER MONITORING

Date: 08-MAY-18	Drawn by: OTHERS	Edited by: BMF	App'd by: MB

OneWay to zero harm

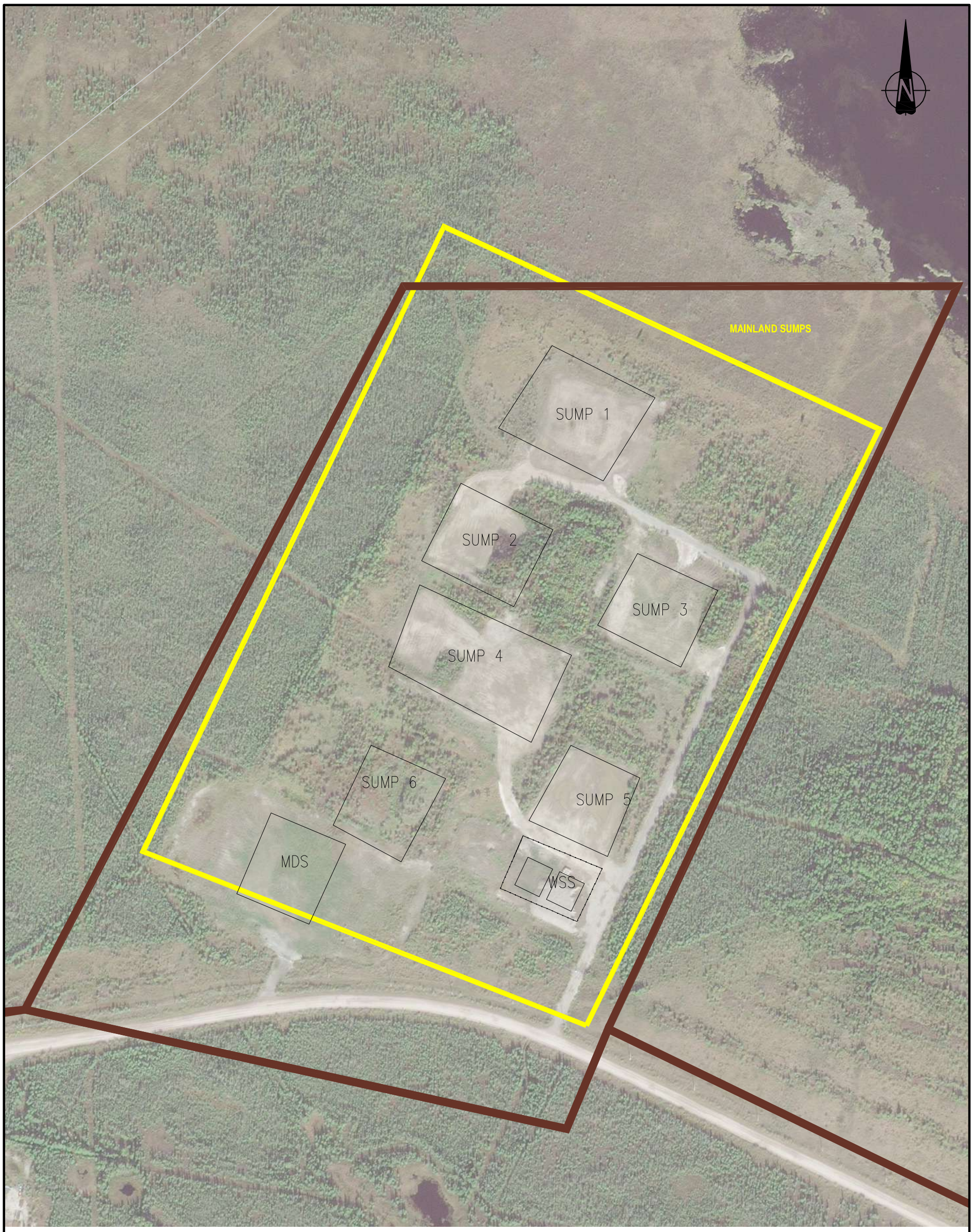
Advisian WorleyParsons Group

WorleyParsons Project No. 407011-00622-300

FIG No 5E | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GIS\407011-00622\300-SLV\BNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-MAINLAND.DWG
PLOT DATE & TIME: 11/5/2018 3:37:15 PM
SAVE DATE & TIME: 10/5/2018 3:37:18 PM
USER NAME: bblefisk
ISSUING OFFICE: eCAD



LEGEND

SITE SUB-AREA

CSM AREA (SEE APPENDIX 8)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND SUMPS AREA

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-300

FIG No 6A | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 10/5/2018 2:47:37 PM
SAVE DATE & TIME: 10/5/2018 2:43:15 PM
USER NAME: blair.link
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018_MAINLANDEAST.DWG

MLS-13-9-3
MLS SW02
MAINLAND SUMPS
MLS 09-2-3
MLS 09-1-3
SUMP 1
MLS-14-5-4
MLS 92-2-2
MLS92-1-3
MLS SW07
MLS 09-3-3
MLS 09-7-2
MLS-14-4-SW
MLS 09-15-3
MLS-14-4-3
MLS SW03
MLS 93-3-6
MLS-14-8-3
SUMP 2
MLS-14-3-3
MLS-14-3-SW
MLS-14-8-SW
MLS SW05
MLS-13-5-2
MLS 09-4-4
MLS SW04
SUMP 3
MLS-10-1-7
MLS 09-6-2
SUMP 4
MLS-14-2-3
MLS 09-5-3
MLS-14-9-SW
MLS SW01
MLS-14-9-3
SUMP 6
SUMP 5
MLS 02-5-8
MLS 08-2-5
MLS SW06
MLS 09-9-2
MLS-10-2-3
MLS-13-2-3
MLS 08-1-4
MLS 09-8-2
MLS 02-10-8
MDS
MLS 08-3-4
WSS
MLS 02-6-9
MLS 02-9-8
MLS 97-12-4
MLS 02-8-8
MLS 02-7-7
MLS-13-3-3
MLS-13-1-3
MLS-13-4-3
ALF 98-1-3
MEBG-12-2-3
MEBG-12-1-3

LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 8)
- MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 150 m

1:3000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

MAINLAND SUMPS -
2017 GROUNDWATER AND SURFACE WATER MONITORING

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

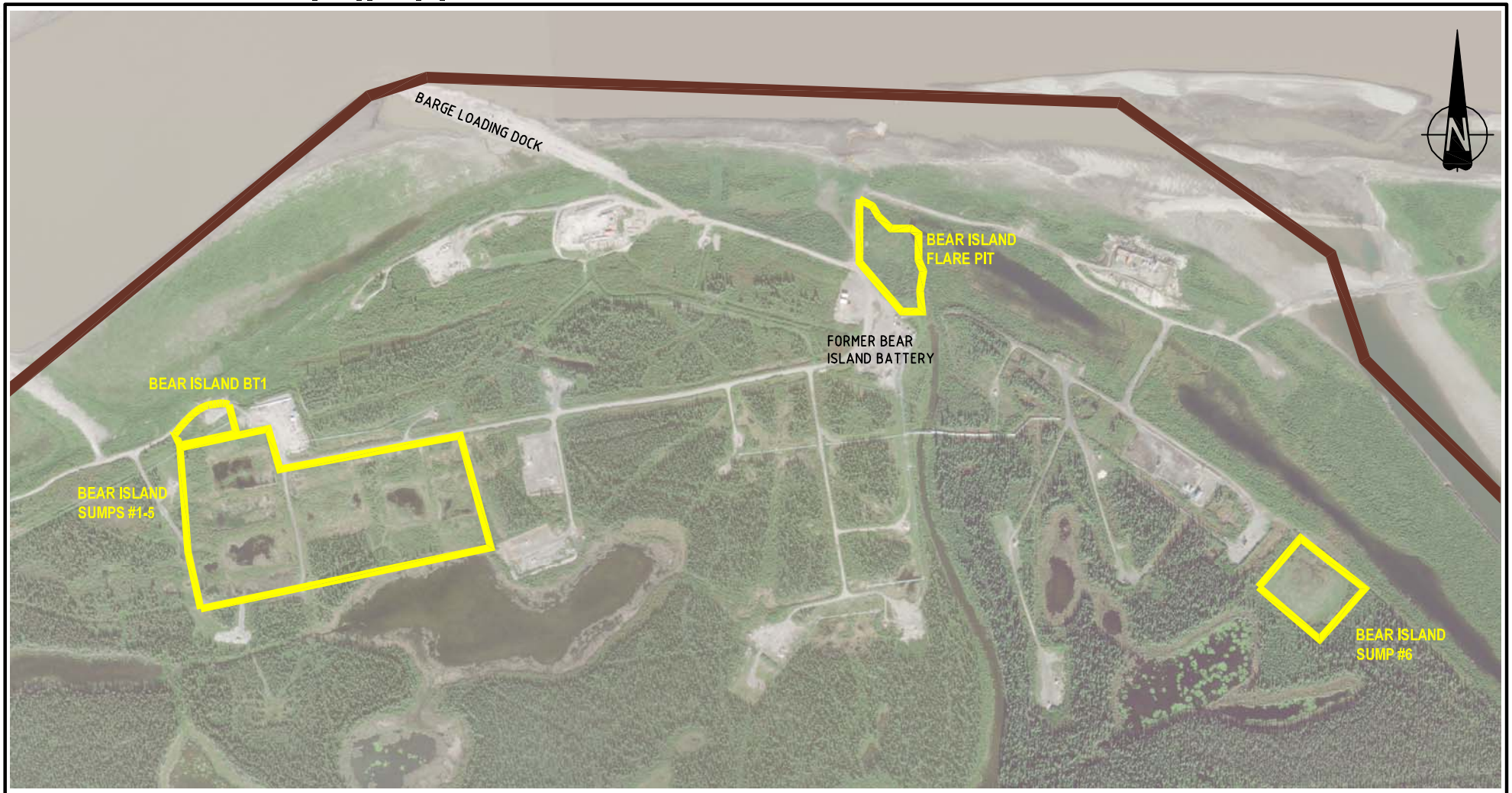
FIG No: 6B
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 10/5/2018 2:49:11 PM
SAVE DATE & TIME: 10/5/2018 2:43:15 PM
USER NAME: blair.link
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018_MAINLANDEAST.DWG

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11,0_FIGURES_&_MAPS\11,4_CAD_FILES\00622-300-00-EN-DWG-SITEAIRPHOTO2017.DWG



LEGEND

SITE SUB-AREA

CSM AREA

CSM LEGEND AND CONCORDANCE

BEAR ISLAND BT1 - APPENDIX 9

BEAR ISLAND SUMPS - APPENDIX 10

BEAR ISLAND FLARE PIT - APPENDIX 11

AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 300 400 500 m

1:10000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

BEAR ISLAND AREAS

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	BMF	-	MB

Advisian
WorleyParsons Group

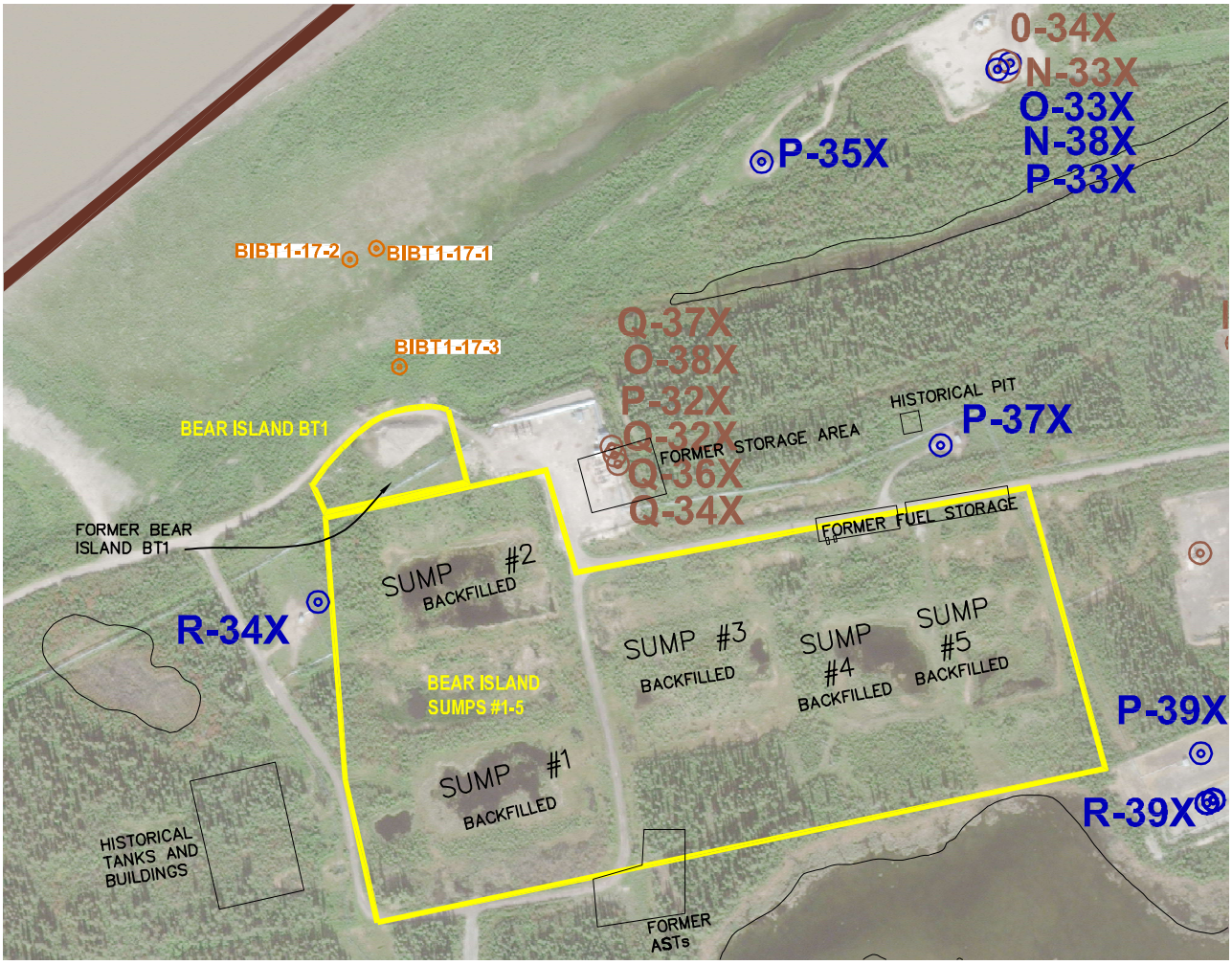
WorleyParsons Project No.
407011-00622-300

FIG No: 7A

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 11/5/2018 9:20:30 AM USER NAME: blair.fink
SAVE DATE & TIME: 10/5/2018 5:24:52 PM ISSUING OFFICE: eCAD



LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 9 AND 10)
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)

SOURCES:

1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 250 m

1:5000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

BEAR ISLAND -
2017 PHASE II ESA (BEAR ISLAND BT1)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

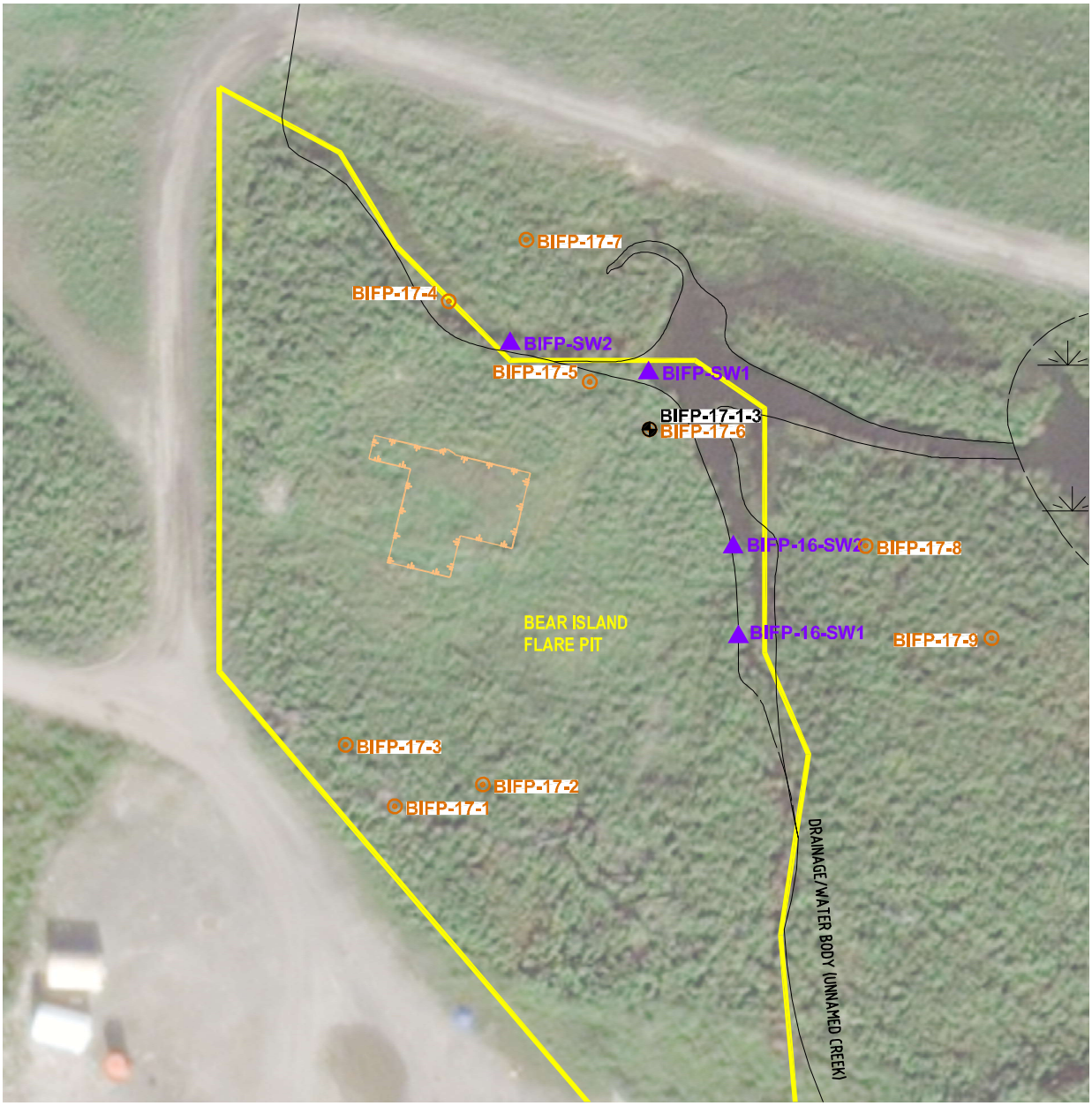
WorleyParsons Project No.
407011-00622-300

FIG No 7B | REV A

*This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

USER NAME: blan.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 10/5/2018 8:28:31 PM
SAVE DATE & TIME: 10/5/2018 8:55:52 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)
- SURFACE WATER SAMPLING LOCATION
- CSM AREA (SEE APPENDIX 11)
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 25 50 75 m

1:1250

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

BEAR ISLAND - 2017 PHASE II ESA (BEAR ISLAND FLARE PIT)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

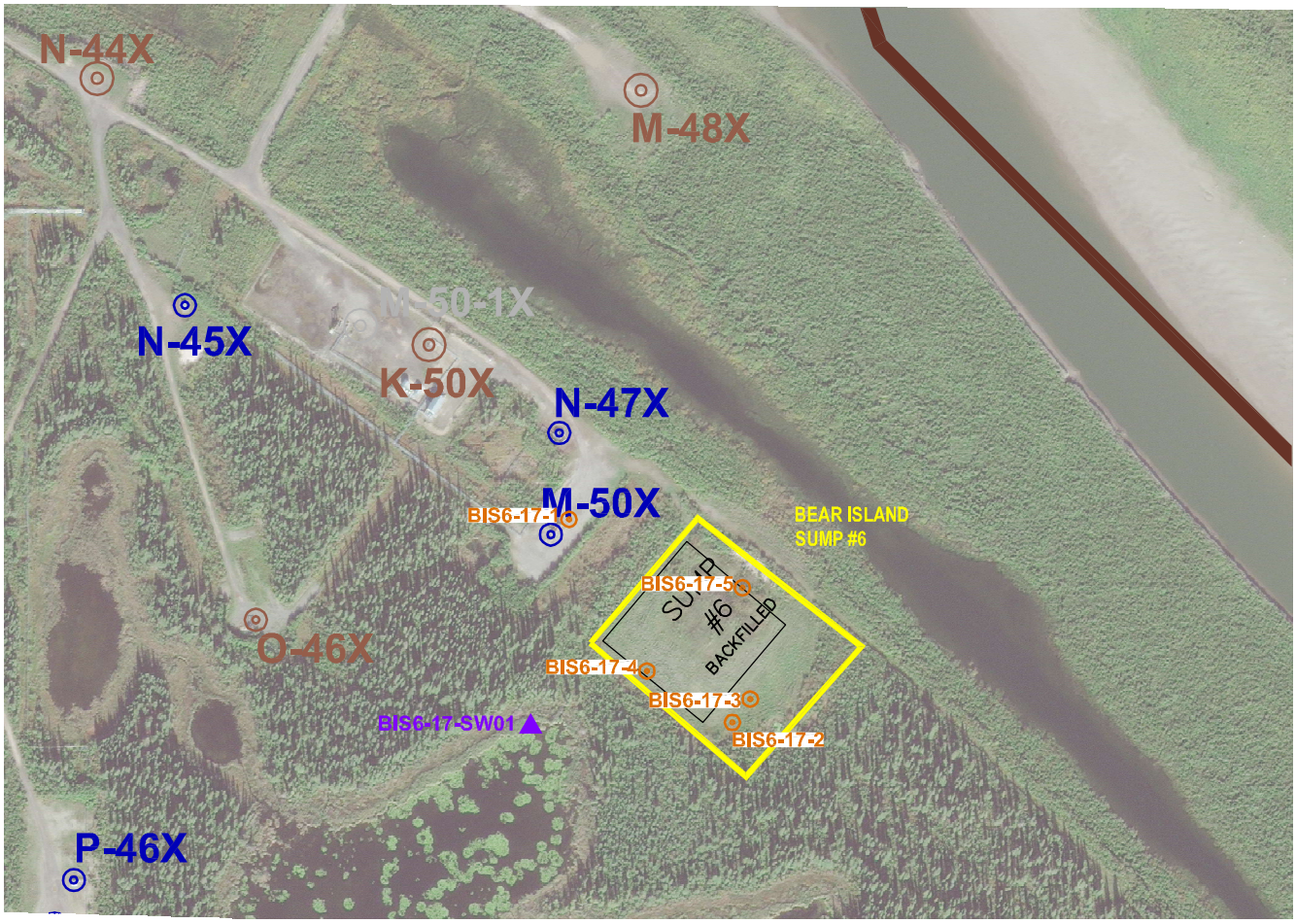
WorleyParsons Project No.
407011-00622-300

FIG No: 7C
REV: A

*This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

PLOT DATE & TIME: 11/5/2018 9:17:21 AM
SAVE DATE & TIME: 10/5/2018 8:27:27 PM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- SITE SUB-AREA
- CSM AREA (SEE APPENDIX 10)
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- FORMER PRODUCTION WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)
- SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 250 m

1:5000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

BEAR ISLAND - 2017 PHASE II ESA (BEAR ISLAND EAST SUMP)

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

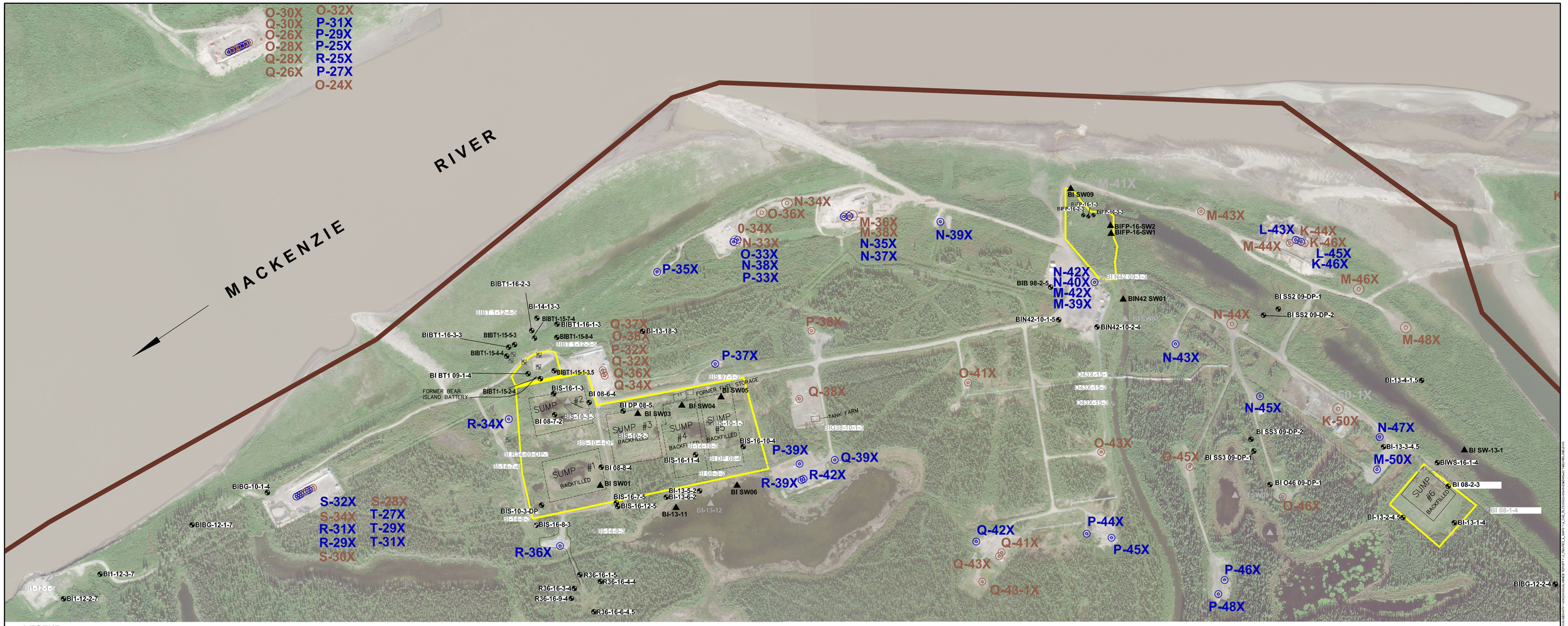
WorleyParsons Project No.
407011-00622-300

FIG No 7D | REV A

*This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

USER NAME: blair.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 10/5/2018 8:25:03 PM
SAVE DATE & TIME: 10/5/2018 8:55:52 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- SITE SUB-AREA
- CSM AREA
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- FORMER PRODUCTION WELL LOCATION
- LEASE BOUNDARY (O.H.W.M.)
- PIPELINE
- MONITORING WELL LOCATION
- OTHER MONITORING WELL LOCATION
- ABANDONED/DESTROYED MONITORING WELL
- 2017 SURFACE WATER SAMPLE LOCATION
- OTHER SURFACE WATER SAMPLE LOCATION

CSM LEGEND AND CONCORDANCE

BEAR ISLAND BT1 - APPENDIX 9

BEAR ISLAND SUMPS - APPENDIX 10

BEAR ISLAND FLARE PIT - APPENDIX 11

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

BEAR ISLAND - 2017 GROUNDWATER AND SURFACE WATER MONITORING

Date	07-MAY-18	Drawn by	OTHERS	Edited by	B.M.F.	Appr'd by	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-300

FIG No. 7E REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."



LEGEND

SITE SUB-AREA

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013.

UTM NAD27

0 100 200 300 400 500m

SCALE 1 : 10,000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

GOOSE ISLAND AREAS

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

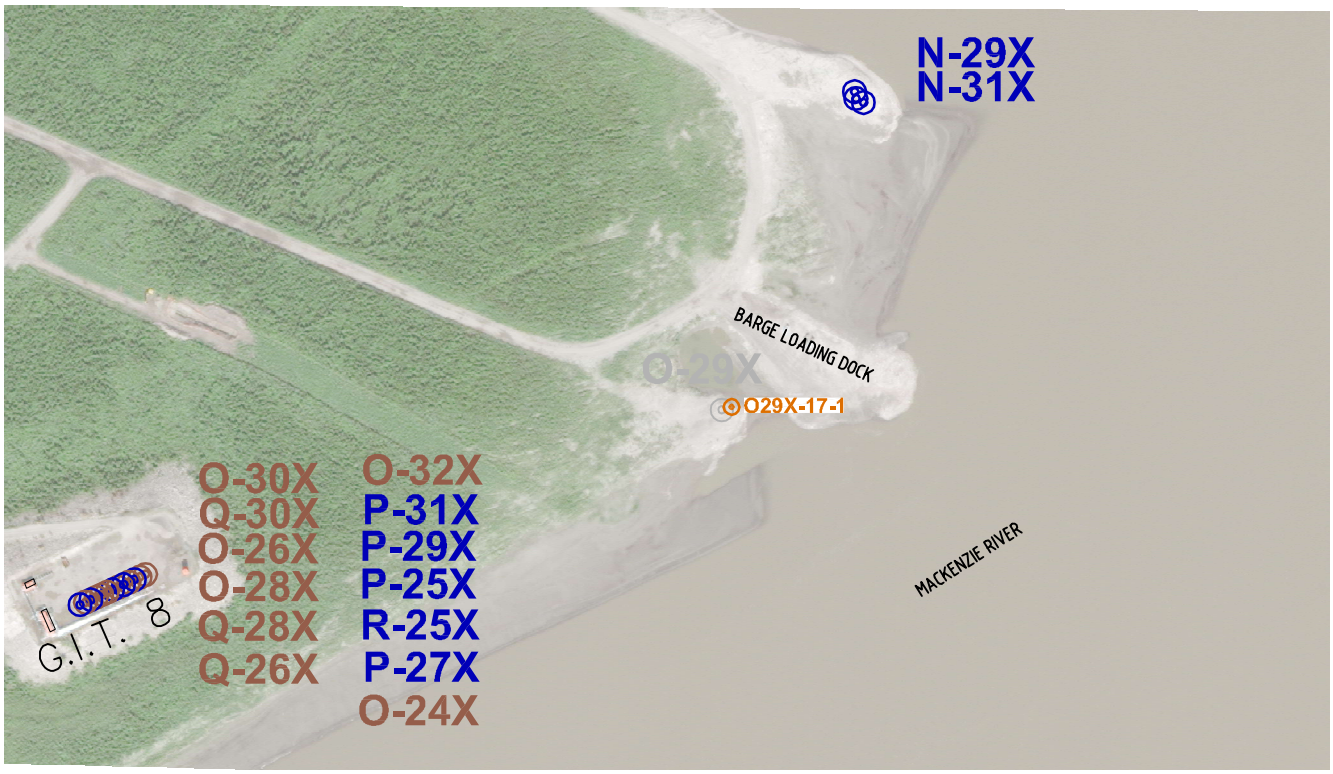
FIG No: 8A

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 10/5/2018 6:29:00 PM
SAVE DATE & TIME: 9/5/2018 10:24:21 AM
USER NAME: bbr-tkx
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWSNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00526-100-00-EN-DWG-2018-GOOSEISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- FORMER PRODUCTION WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 50 100 250 m

1:5000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

GOOSE ISLAND - 2017 PHASE II ESA

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

FIG No 8B | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blair.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 10/5/2018 8:23:12 PM
SAVE DATE & TIME: 10/5/2018 8:55:52 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- SITE SUB-AREA
- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- OTHER MONITORING WELL LOCATION
- 2017 SURFACE WATER SAMPLE LOCATION
- OTHER SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013.

UTM NAD27

0 100 200 300 400 500m

SCALE 1 : 10,000

IMPERIAL
2017 ANNUAL RECLAMATION PROGRESS REPORT
NORMAN WELLS, NT

GOOSE ISLAND -
2017 GROUNDWATER AND SURFACE WATER MONITORING

Date:	Drawn by:	Edited by:	App'd by:
08-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

FIG No: 8C
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CALGBS\407011-00622\0300-SLWSNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00526-100-00-EN-DWG-2018-GOOSEISLAND.DWG

PLOT DATE & TIME: 10/5/2018 9:52:24 PM
SAVE DATE & TIME: 9/5/2018 10:24:21 AM
USER NAME: bfisher
ISSUING OFFICE: CALGARY

Appendices



Appendix 1 Water Licence S13L1-007



Pursuant to the *Mackenzie Valley Resource Management Act* and Regulations, the Sahtu Land and Water Board, hereinafter referred to as the Board, hereby grants to:

Imperial Oil Resources N.W.T. Limited
Norman Wells Operations

(Licensee)

of **Bag Service 5000, Norman Wells, NT, X0E 0V0**

(Mailing Address)

Hereinafter called the Licensee, the right to alter, divert or otherwise use water subject to the restrictions and conditions contained in the *Mackenzie Valley Resource Management Act* and Regulations made there under and subject to and in accordance with the conditions specified in this Licence.

Licence Number:	S13L1-007
Licence Type:	A
Location:	NORMAN WELLS PROVEN AREA, NT
Purpose:	WATER USE AND WASTE DISPOSAL
Description:	FOR INDUSTRIAL UNDERTAKINGS IN OIL AND GAS PRODUCTION, AND ASSOCIATED USES
Effective Date of Licence:	
Term of Licence:	10 YEARS
Expiry Date of Licence:	

This Licence issued and recorded at Fort Good Hope, NT, includes and is subject to the annexed conditions.

Sahtu Land and Water Board:

Witness **Chair – Mr. Larry Wallace**

APPROVED BY: _____

Minister of Indian Affairs and Northern Development

List of Abbreviations

AANDC	Aboriginal Affairs and Northern Development Canada
AEMP	Aquatic Effects Monitoring Program
BTEX	benzene, toluene, ethylbenzene, and xylenes
CPF	Central Processing Facility
EQC	Effluent Quality Criteria
GW	Groundwater
ICP-MS	Inductively coupled plasma mass spectrometry
IORL	Imperial Oil Resources N.W.T. Limited, the Licensee
MVRMA	Mackenzie Valley Resource Management Act
NT	Northwest Territories
NWPA	Norman Wells Proven Area
QA/QC	Quality Assurance and Quality Control
SNP	Surveillance Network Program

Table of Contents

Sections of the Water Licence

Part A: Scope and Definitions
Part B: General Conditions
Annual Report – Schedule 1
Part C: Conditions Applying to Security
Security Requirements – Schedule 2
Part D: Conditions Applying to Water Use
Water Use – Schedule 3
Part E: Conditions Applying to Waste and Waste Management
Groundwater Management Plan – Schedule 4
Part F: Conditions Applying to Operation and Maintenance
Flowline Integrity and Mackenzie River Breakup Report – Schedule 5
Part G: Conditions Applying to Modifications
Part H: Conditions Applying to Contingency Planning
Part I: Conditions Applying to Aquatic Effects Monitoring
AEMP Design Plan – Schedule 6
Part J: Conditions Applying to Closure and Reclamation
Closure and Reclamation Report – Schedule 7

Schedules

Schedule 1: General Conditions
Schedule 2: Security Requirements
Schedule 3: Water Use
Schedule 4: Groundwater Management Plan
Schedule 5: Flowline Integrity and Mackenzie River Breakup Report
Schedule 6: Aquatic Effects Monitoring

Annex A: Surveillance Network Program

Part A: Location of Surface Water Surveillance Stations
Part B: Quality Assurance and Quality Control
Part C: Sampling and Analysis Requirements for Surface Water SNP Stations
Part D: Reports
Part E: Sampling and Analysis Requirements for Surface Water Run-Off Facilities
Part F: Surface Water Run-off Facility Categories
Part G: Groundwater Monitoring Wells
Part H: Flow, Volume and Temperature Measurement Requirements

Part A: Scope and Definitions

1. Scope

a) This Licence entitles Imperial Oil Resources N.W.T. Limited to use waters and dispose of Waste for industrial undertakings in oil and gas production, closure and reclamation, and associated uses at the Norman Wells Norman Wells Proven Area located at Latitude 65º 17' N., Longitude 126º51' W., in the Northwest Territories;

b) This Licence is issued, subject to the conditions contained herein, with respect to the use of Waters and the deposit of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor-in- Council under the *Mackenzie Valley Resource Management Act*, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations; and,

c) Compliance with the terms and conditions of this Licence does not affect the Licensee's obligation to comply with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

"Act" means the *Mackenzie Valley Resource Management Act*.

"Acute Lethality" means an effluent which is deemed acutely lethal if the undiluted (100%) effluent kills 50% or more of the fish or daphnia in the test. (Biological test method: Acute Lethality Test Using Rainbow Trout Report EPS 1/RM/9 July 1990), and (Biological test method: Acute Lethality of Effluents to Daphnia magna EPS 1/RM/14 Second Edition December 2000), as may be amended from time to time.

"Analyst" means an Analyst designated by the Minister under Sub-section 84(2) of the *Act*.

"Aquatic Effects Monitoring Program" means a monitoring program designed to determine the short and long-term effects in the Receiving Environment resulting from Project activities and to evaluate if the Receiving Environment is being adequately protected or Waters used are being adequately managed or additional mitigation measures are necessary.

"Artificial Islands" means the physical structure of the constructed islands, including the sand core, slope and scour protection, drilling equipment and supplies, storage facilities, well head equipment, and temporary or permanent buildings.

"Biocell" comprises the area or engineered cell designed for the treatment of contaminated soil through biological processes by degradation of contaminants. The

bioremediation process may involve the addition of water and nutrients, as well as aeration through mechanical processing.

"Board" means the Sahtu Land and Water Board established under Section 56 of the *Act*.

"Central Processing Facility" means the plant where oil, gas, and Produced Water are collected from the oilfield and separated, with plant cooling being accomplished using Mackenzie River water.

"Commercial Operations" means the period of oil production.

"Discharge" means the direct or indirect release of any Waters or Waste to the Receiving Environment.

"Flowline" means a line that is used to transport fluids from a well to a production facility or vice versa, and includes intrafield export and all gathering lines.

"Grab Sample" means an instantaneous sample of Waters.

"Groundwater" means all Waters below the ground surface.

"**Groundwater Treatment Facilities"** system designed to collect and treat contaminated Groundwater.

"Impermeable Lined Diked Areas" means an area enclosed by a dike incorporating a synthetic liner that is considered to be impermeable to leakage for the purposes of completely containing all drilling fluids and drilling Wastes within the diked and lined area.

"Inspector" means an Inspector designated by the Minister under Sub-section 84(1) of the *Act*.

"Licensee" means the holder of this Licence.

"Minister" means the Minister of Indian Affairs and Northern Development;

"Modification" in respect of a structure, means a change, other than an expansion, that does not alter the purpose or function of a structure.

"Natural Islands" means Bear, Goose, and Frenchy's Islands, including drilling equipment and supplies, waste and storage facilities, well-head equipment, and temporary or permanent buildings.

"Norman Wells Proven Area" means the proven area identified in the Proven Area Agreement between Canada and Imperial Oil Limited dated July 21, 1944, as amended.

"Produced Water" means Waters naturally present in the reservoir or injected into the reservoir to enhance production and produced as a co-product when gas or oil is produced.

"Project" means the undertaking described in Part A, Item 1.

"Receiving Environment" means, for the purpose of this Licence, the natural environment that receives any deposit or Discharge of Waste, including runoff, from the Project.

"Reclamation" means activities which facilitate the return areas affected by the Project to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment, human activities, and the surrounding environment.

"Regulations" means Regulations proclaimed pursuant to Section 90.3 of the *Act*.

"Representative Grab Sample" means a grab sample consisting of equal portions of Water collected from a minimum of two locations within one site.

"River Ice Breakup" means the period from the time the ice first starts to move in the Mackenzie River at Norman Wells in the spring, to the time when the River is free of pack ice at Norman Wells.

"Single Composite Sample" means a sample composed of proportional sub-samples taken over a time period acceptable to an Inspector, as approved by the Analyst, and submitted to the Board in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

"Surface Water Run-Off Facilities" means those locations referred to in Annex A, Part F.

"Surveillance Network Program" refers to the program set out in Annex A.

"Unauthorized Discharge" is a Discharge of any waters or Waste not authorized under this Licence or legislation.

"Waste" means waste as defined in Section 51 of the *Act.*

"Watercourse" a natural body of flowing or standing water or an area occupied by water during part of the year, and includes streams, springs, swamps and gulches but does not include groundwater.

"Waterflood" means the injections of Waters into the Norman Wells oilfield reservoir for pressure maintenance and enhanced oil production.

"Waters" means waters as defined in Section 51 of the *Act*;

"Water Intake" means the wetwell pump and associated facilities installed in the Mackenzie River and the water line to the Central Processing Facility.

Part B: General Conditions

1. The Licensee shall ensure that a copy of this Licence is maintained on the Project site at all times.

2. The water use fee shall be paid annually in advance of any use of Waters, in accordance with the Mackenzie Valley Land and Water Board's *Water Use Fee Policy*.

3. The Licensee shall operate in accordance with any Management Plans (Plans) approved pursuant to the conditions of this Licence and with any revision to the Plans as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board. If any Plan or proposed update is not approved by the Board, the Licensee shall revise the Plan according to the Board's direction and re-submit it to the Board for approval.

4. The Licensee shall comply with the Schedules, which are annexed to and form part of the Licence.

5. The Schedules may be amended at the discretion of the Board through a process which shall include public notice of the Board's intention to consider a change, such Notice to be provided to the Licensee, the Minister, regional AANDC officials and other affected or interested stakeholders. Any such Notice shall be accompanied by an explanation of the proposed change to a Schedule and a reasonable opportunity shall be provided for comments to be provided by interested parties, and considered by the Board, before a decision is made.

6. The matters for which flexibility is required by the Board and where amendments to Schedules may be made by the Board from time to time under Part B Item 5 include the following:

    - Schedule 1 General Conditions;
    - Schedule 2 Conditions Applying to Security;
    - Schedule 3 Conditions Applying to Water Use;
    - Schedule 4 Conditions Applying to Waste and Waste Management;
    - Schedule 5 Conditions Applying to Operations and Maintenance;
    - Schedule 6 Conditions Applying to Aquatic Effects Monitoring; and
    - Schedule 7 Conditions Applying to Closure and Reclamation.

7. The Licensee shall comply with the **Surveillance Network Program**, which is annexed to and forms part of this Licence, and any amendments to the **Surveillance Network Program** as may be made from time to time by the Board.

8. The **Surveillance Network Program** and any compliance dates specified in this Licence may be amended at the discretion of the Board.

9. Meters, devices, or other such methods used for measuring the volumes of Waters used and Waste discharged shall be installed, operated and maintained by the Licensee to the satisfaction of an Inspector.

10. The Licensee shall post and maintain signs necessary to identify the stations of the **Surveillance Network Program** in a manner satisfactory to an Inspector.

11. Within 60 days following the effective date of this Licence, the Licensee shall submit to the Board for approval, a revised **Engagement Plan**. The Plan shall be in accordance with the Mackenzie Valley Land and Water Board's *Engagement Guidelines for Applicants and Holders of Land Use Permits and Water Licences,* June 2013, or subsequent editions.

12. The Licensee shall review the **Engagement Plan** annually and shall submit updates to the Board for approval at the following times:

    a) If the Licensee seeks changes to the Plan; and

    b) Upon the request of the Board.

13. In each year of the Licence term, the Licensee shall file an **Annual Report** with the Board. The report shall be filed no later than March 31st of the year following the calendar year reported. The report shall contain the information set out in Schedule 1, Item 1.

14. In conducting its activities under this Licence, the Licensee shall make best efforts to consider and incorporate any scientific information and traditional knowledge that is made available to the Licensee.

Part C: Conditions Applying to Security

1. The Licensee shall post and maintain a security deposit in an amount in accordance with Schedule 2, Item 1.

2. The Licensee shall submit an updated Reclamation liability estimate utilizing the current version of RECLAIM, or another method acceptable to the Board,

   a) If the Licensee seeks changes to the Closure and Reclamation Plan; and

   b) Upon request of the Board.

3. The amount of the security deposit required by Part C, Item 1 and Schedule 2, Item 1 may be revised by the Board in accordance with Part B Item 5 based on estimates of the current Reclamation liability referred to in Part C, Item 2 of this Licence or based on such other information as may be available to the Board.

4. If the amount of the security deposit is revised by the Board as described under Part C, Item 3, the Licensee shall post the revised amount with the Minister within 90 days of the Board giving notice of the revised amount.

5. The Licensee shall submit an updated Reclamation liability estimate after approval of the Closure and Reclamation Plan, using the current version of RECLAIM or another method acceptable to the Board.

Part D: Conditions Applying to Water Use

1. The Licensee shall obtain all Waters from the Mackenzie River, unless otherwise approved by the Board, for Central Processing Facility cooling, Waterflood, drilling, and any other industrial or maintenance uses associated with operations utilizing the approved Water Intake.

2. The Licensee may use Waters from the Surface Water Runoff Facilities for dust suppression only if those Waters meets the effluent quality criteria established in Part E, Item 1 of the **Surveillance Network Program** (Annex A), or as otherwise approved by the Board.

3. The annual quantity of Waters withdrawn for any purpose shall not exceed the limits set out in Schedule 3, Item 1.

4. The Licensee shall minimize the total amount of Waters used by the Project using appropriate water conservation methods, such as, but not limited to, the injection of Produced Water into the Norman Wells Proven Area oilfield reservoir.

Part E: Conditions Applying to Waste and Water Management

1. The Licensee shall manage Waters and Waste with the objective of minimizing the effects of Project activities on the quantity and quality of Waters in the Receiving Environment through the use of appropriate mitigation measures, monitoring, and follow-up actions.

Management Plans

2. Within six months following the effective date of this Licence, the Licensee shall submit to the Board for approval, a revised **Groundwater Management Plan**. The Plan shall be in accordance with the Mackenzie Valley Land and Water Board's *Standard Outline for Management Plans* and the requirements as set out in Schedule 4, Item 1. The Plan shall include the groundwater monitoring wells identified in Annex A, Part G.

3. The Licensee shall operate in accordance with the **Groundwater Management Plan**, once approved.

4. The Licensee shall review the **Groundwater Management Plan** annually and shall submit updates to the Plan to the Board for approval at the following times:

   a) If the Licensee seeks changes to the Plan; and

   b) Upon request of the Board.

5. The Licensee shall operate in accordance with the **Environmental Protection Plan**, once approved.

6. The Licensee shall review the **Environmental Protection Plan** annually and shall submit updates to the Plan to the Board for approval at the following times:

   a) If the Licensee seeks changes to the Plan; and

   b) Upon request of the Board.

7. The Licensee shall operate in accordance with the **Waste Management Plan**, once approved. The Plan shall be in accordance with the Mackenzie Valley Land and Water Board's *Guidelines for Developing a Waste Management Plan*, March 2011, or subsequent editions.

8. The Licensee shall review the **Waste Management Plan** annually and shall submit updates to the Plan to the Board for approval at the following times:

   a) If the Licensee seeks changes to the Plan; and

   b) Upon request of the Board.

9. The Licensee shall maintain a copy of the **Waste Management Plan** on-site in a readily available location to the satisfaction of an Inspector.

General Conditions

10. The Licensee shall not use any biocides where they may enter any Watercourse unless approved by the Board.

11. The Licensee shall ensure that any fuels, chemicals or Waste(s) associated with the Project do not enter any Waters, except in the manner described in the **Surveillance Network Program**.

Effluent Quality Criteria

12. The Licensee shall discharge water in a controlled manner designed to avoid flooding or erosion.

13. All sewage Waste(s) shall be disposed of at a licensed sewage disposal facility.

14. The Licensee shall not release hydrostatic test fluids to land and/or Waters. Hydrostatic test fluids shall be handled through the Licensee's injection processes.

15. No Waste(s) discharged at SNP Station S13L1-007 – 2 to the Mackenzie River shall be acutely lethal to fish nor shall it exceed the following effluent quality criteria:

Parameter	Maximum Average Concentration	Maximum Concentration of Any Grab Sample
Total Petroleum Hydrocarbons	3.0 mg/L	5.0 mg/L
Phenols	0.07 mg/L	0.14 mg/L
Chloride	250 mg/L	500 mg/L
Total Suspended Solids	N/A	N/A
Specific Conductivity	N/A	N/A

16. The Waste referred to in Part E Item 15 shall have a pH between 6.0 and 9.0

Part F: Conditions Applying to Operation and Maintenance

1. The Licensee shall drill all wells from within Impermeable-Lined Diked Areas.

2. The Licensee shall undertake any necessary annual maintenance required to preserve the structural integrity of the Artificial Islands, and where required on the Natural Islands.

3. The Licensee shall inspect the riverbeds, channels and banks of the Mackenzie River in the vicinity of the Flowline(s), and shall immediately notify the Inspector of any significant risk to infrastructure, public safety or the environment from erosion and take appropriate remedial action as required.

4. The Licensee shall operate in accordance with the **Flowline Integrity Management Plan**, once approved.

5. The Licensee shall review the **Flowline Integrity Management Plan** annually and shall submit updates to the Plan to the Board for approval at the following times:

   a) If the Licensee seeks changes to the Plan; and

   b) Upon request of the Board.

6. The Licensee shall submit an **Annual Flowline Integrity and Mackenzie River Breakup Report** no later than October 31st of the year being reported. The report shall contain the information set out in Schedule 5, Item 1.

Part G: Conditions Applying to Modifications

1. The Licensee may, without written consent from the Board, carry out Modification(s) to the water supply and Waste disposal facilities, bunkers, docks, bridges, flowlines, creek banks, and river banks provided that the Modification(s) are consistent with the terms of this Licence and the following requirements are met:

    a) the Licensee has provided the details of the proposed Modification(s) to the Board, in writing, at least 60 days prior to the commencement of the Modification(s);

    b) the Modification(s) does not place the Licensee in contravention of either the Licence, the Act or Federal, Territorial or Municipal Legislation;

    c) the Board has not, during the 60 days following notification of the proposed Modification(s), informed the Licensee that review of the proposal will require more than 60 days; and

    d) the Board has not rejected the proposed Modification(s).

2. Modification(s) for which all of the conditions referred to in Part G: Item 1, have not been met, can be carried out only with written approval from the Board.

3. The Licensee shall provide as-built plans and drawing of the Modification(s) referred to in this Licence within 90 days of completion of the Modification(s).

Part H: Conditions Applying to Contingency Planning

1. The Licensee shall operate in accordance with the **Spill Contingency Plan**, once approved. The Plan shall be in accordance with Indian and Northern Affairs Canada's *Guidelines for Spill Contingency Planning,* 2007, or subsequent editions.

2. The Licensee shall operate in accordance with the **Emergency Response Plan**, once approved.

3. The Licensee shall review the Management Plans referred to in Part H, Items 1 and 2 annually and shall submit updates to the Plans to the Board for approval at the following times:

   a) If the Licensee seeks changes to the Plans;

   b) Upon request of the Board.

4. The Licensee shall carry out field and communication exercises annually to demonstrate the capability to contain, recover and report spills under a variety of environmental conditions, such as early and late winter ice conditions, and moderate and high flow conditions.

5. The Licensee shall undertake further field and communication exercises at the request of the Board.

6. If, during the period of this Licence, a spill or an Unauthorized Discharge of Waste(s) occurs, or is foreseeable, the Licensee shall:

   a) Implement the **Spill Contingency Plan**;

   b) report the incident immediately via the 24 Hour NWT Spill Reporting Line (867) 920-8130 in accordance with the instructions contained in the Spill Report Form NWT 1752/0593 or subsequent editions;

   c) report each spill and Unauthorized Discharge of Waste to the Board and an Inspector within 24 hours; and

   d) within 30 days of an Unauthorized Discharge or an incident reported under Part H, Item 6b), the Licensee shall submit a detailed report to the Board and an Inspector. The report shall include descriptions of causes, response actions, and any changes to procedures to prevent similar occurrences in the future.

7. All spills and Unauthorized Discharges of water or Waste shall be cleaned up and the affected area reclaimed to the satisfaction of an Inspector.

Part I: Conditions Applying to Aquatic Effects Monitoring

1. The Licensee shall submit within one year of the effective date of this Licence an Aquatic Effects Monitoring Program (AEMP) Design Plan for approval by the Board. **The Aquatic Effects Monitoring Program Design Plan** should be developed in accordance with AANDC's "Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the NWT" and shall satisfy the requirements of Schedule 6, Item 1.

2. The Licensee shall adhere to the approved **Aquatic Effects Monitoring Program Design Plan** and shall annually review the Plan and make any necessary revisions to reflect changes in operations, technology, chemicals or fuels, or as directed by the Board. Revisions to the Plan shall be submitted to the Board for approval.

3. The Licensee shall submit an **AEMP Annual Report** to the Board for approval on or before April 30, 2017 and each year thereafter.

Part J: Conditions Applying to Closure and Reclamation

1. The Licensee shall submit within one year of the Licence being issued a **Closure and Reclamation Plan** for approval by the Board.

2. The Licensee shall adhere to the approved **Closure and Reclamation Plan** and shall annually review the Plan and make any necessary revisions to reflect changes in operations, technology, chemicals or fuels, or as directed by the Board. Revisions to the Plan shall be submitted to the Board for approval.

3. The Licensee shall carry out Progressive Reclamation of areas affected by licensed operations as soon as is reasonably practicable.

4. The Licensee shall provide an **Annual Closure and Reclamation Plan Progress Report** no later than May 31st following the calendar year being reported. The report shall contain the information set out in Schedule 7, Item 1.

5. A minimum of 24 months prior to the end of Commercial Operations, the Licensee shall submit a **Final Closure and Reclamation Plan** to the Board for approval.

Signed the 4th day of December, 2014 on behalf of the Sahtu Land and Water Board

Witness

Mr. Larry Wallace, Chair
Sahtu Land and Water Board

Annex A: Surveillance Network Program (SNP)

SAHTU LAND AND WATER BOARD

LICENSEE: IMPERIAL OIL RESOURCES N.W.T. LIMITED

LICENCE NUMBER: S13L1-007

EFFECTIVE DATE OF LICENCE ISSUANCE:

A. Location of Surface Water Monitoring Stations

Station	Status	Description	Location
S13L1-007 -1	Active	Central Processing Facility Intake water from the Mackenzie River.	W126°53.053' N65°17.230'
S13L1-007 - 2	Active	Central Processing Facility discharge return line to the Mackenzie River.	W126°53.093' N65°17.196'

B. Quality Assurance and Quality Control

1. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of American Public Health Association's (APHA) *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Analyst.

2. All analyses shall be performed in a laboratory approved by the Analyst.

3. The Licensee shall review the **Quality Assurance and Quality Control Manual** annually and shall revise the manual as necessary to reflect changes in field and laboratory quality control and quality assurance testing, procedures and technology. The proposed revision(s) shall be submitted to the Board for approval. The manual shall be implemented as approved by the Analyst.

4. The Licensee may, upon notifying the Inspector, clean the settling pond at the Central Processing Facility according to the CPF Settling Pond Cleaning Procedure, approved by the Board and amended from time to time.

C. Sampling and Analysis Requirements for Surface Water SNP Stations

1. A Single Composite Sample of water at SNP Station S13L1-007 – 1 shall be sampled and analyzed for the following parameters and frequencies:

Parameter	Sampling Frequency
Phenols	Once per week
Total Petroleum Hydrocarbons	Once per week
Total Suspended Solids	Twice per week
pH	Twice per week
Specific Conductivity	Twice per week

2. A Representative Grab Sample of Water(s) shall be collected at SNP station S13L1-007 - 1 quarterly (four samples throughout the year) and analyzed for the following parameters:

Parameters		
pH	Chloride	Total Alkalinity
Sodium	Calcium	Specific Conductivity
Potassium	Magnesium	Total Suspended Solids
Sulphate	Phenols	Total Dissolved Solids
Total Petroleum Hydrocarbons	Total Phosphorus	Total Hardness

3. A Single Composite Sample of water at SNP Station S13L1-007 – 2 shall be sampled and analyzed for the following parameters and frequencies:

Parameter	Sampling Frequency
Phenols	Once per week
Total Petroleum Hydrocarbons	Once per week
Total Suspended Solids	Twice per week
pH	Twice per week
Specific Conductivity	Twice per week

4. A daily Grab Sample of water at SNP Station S13L1-007 – 2 shall be field analyzed for Total Residual Chlorine.

5. No Wastes discharged at SNP Station S13L1-007 – 2 to the Mackenzie River shall exceed the effluent criteria set out in Part E, Item 15 of the Licence.

6. A Representative Grab Sample of Water(s) shall be collected at SNP Station S13L1-007 – 2 quarterly (four samples throughout the year at the same time as Acute Lethality testing) and analyzed for the following parameters:

Parameters		
pH	Chloride	Total Alkalinity
Sodium	Calcium	Specific Conductivity

Potassium	Magnesium	Total Suspended Solids
Sulphate	Phenols	Total Dissolved Solids
Total Petroleum Hydrocarbons	Total Phosphorus	Total Hardness

7. The Licensee shall determine the Acute Lethality of the Waste Waters at SNP station S13L1-007 - 2 and performed in a quarterly (four samples throughout the year) time frequency.

8. The Licensee shall provide a 28-day average concentration of the parameters outlined in SNP Part C, Items 3 and 4. The average concentration shall be reported in accordance with SNP Part D, Item 1.

D. Reports

1. The Licensee shall within 30 days following the month being reported, submit to the Board, all data and information required by the SNP including the results of the approved **Quality Assurance Plan**.

E. Sampling and Analysis Requirements for Surface Water Run-Off Facilities

1. A Representative Grab Sample and analysis of all Waters collected in the Surface Water Run-Off Facilities (listed in section F of the Surveillance Network Program) discharged to lands and/or Waters, and/or to be used for dust suppressant on roads, shall be obtained prior to Discharge.

    a) Water to be Discharged from Surface Water Run-Off Facilities (listed as Category A in section F of the Surveillance Network Program) shall be analyzed for the following prior to Discharge and weekly during Discharge:

Parameter	Guideline
Visible oil sheen on the water	Presence of
Chlorides (Field Test)	< 500 mg/L
pH (Field Test)	6.0 – 9.0

    b) Water to be Discharged from Surface Water Run-Off Facilities (listed as Category B in section F of the Surveillance Network Program) shall be analyzed for the following prior to Discharge and weekly during Discharge:

Parameter	Guideline
Total Petroleum Hydrocarbons	5.0 mg/L
Phenols	0.14 mg/L
pH	6.0 -9.0
Chlorides	< 500 mg/L
Total Suspended Solids	N/A
Total Dissolved Solids	N/A
Specific Conductivity	N/A

c) Water shall not be released from Surface Water Run-off Facilities if there is exceedance(s) of criteria in 1(a) and 1(b) above without consulting the Board and Inspector. The licensee shall make every effort to investigate exceedance(s) and treat the water before Discharge.

d) When discharging water volumes greater than 10 m^3, the Discharge shall be monitored by obtaining a Representative Grab Sample(s) and conducting subsequent analyses as outlined in SNP Part E, Items 1 (a) or (b). Samples shall be taken before, in the middle, and the end of the Discharge period. For water volumes less than 10 m^3, a single Representative Grab Sample shall be collected and analyzed before the Discharge begins.

e) An estimate of the total volume of water discharged shall be recorded for each Discharge.

f) Water(s) collected in any area associated with Imperial Oil's Norman Wells operations and facilities not listed in Part F shall be sampled and analyzed as per SNP Part E, Items 1 (b-d), as required.

F. Surface Water Run-off Facility Categories

This Section is intended to outline any area associated with Imperial Oil's Norman Wells operations and facilities that may be used to collect surface water, which will ultimately require Discharge to land(s) and/or Water(s).

Surface Water Run-Off Facilities include impound basins and areas, excavations, bunkers, bermed areas, and associated ditches provided for the collection, storage, and Discharge of Surface Water Run-off from Imperial Oil's Norman Wells operations and facilities. Figure 1 provides a colour coded map of the different Surface Water Run-Off Facilities.

Category A – includes excavations (in areas where there are no known historical impacts), bunkers, bermed areas, and associated ditches.

Category B – includes;

Location	**Coordinates**
CPF Impound Area	W126°53.121’ N65°17.132’
LT 11 Impound Basin	W126°51.722’ N65°17.027’
Refinery Impound Basin	W126°50.817’ N65°16.888’
Refinery Water Flood Basin	W126°50.539’ N65°16.938’
Refinery Tank Farm	
Field Services Storage Yard	
Biocell	
Capped Sumps	
Excavations (in areas where there is known historical impacts)	
Or any area where the Surface Water Run-Off from Category A does not meet the requirements outlined in SNP Part E: 1(a).	

Map of Surface Water Monitoring Stations and Surface Water Run-Off Facilities on Figure 1

G. Groundwater Monitoring Wells

Station	Status	Description	Location
CPF 97-7-5	1997	Located between Central Processing Facility and Bosworth Creek.	W126°877.462’ N65°286.553’
CPF-98-8-3	1998	Located between Central Processing Facility and the Mackenzie River.	W126°885.929’ N65°286.553’
WSY-97-1-5	1997	Closest well located between the Well Service/Warehouse Yard and Bosworth Creek	W126°873.608’ N65°288.127’
ARB-12-3-3	2012	Closest groundwater monitoring well to the biocell	W126°86.037’ N65°28.759’

C38-08-1-4	2008	Located between known previous well issues (C36x) and the Mackenzie River	W126°856.857’ N65°283.478’
TF-03-12-3	2003	Located between the Tank Farm and the Mackenzie River and downgradient from a known hydrocarbons source	W126°846.446’ N65°282.365’
MTF-97-1-5	1997	Located between the Tank Farm and the town of Norman Wells	W126°838.576’ N65°283.627’
BIS-97-1-3	1997	Located between Bear Island sump #5 (near P37X) and the Mackenzie River	W126°895.531’ N65°257.705’
BI-13-3-4-5	2013	Located near Bear Island sump #6 (near M50X) and the Mackenzie River	W126°86.266’ N65°25.581’
BIBG-12-1-7	2012	Located at the western edge of the development on Bear Island and the Mackenzie River	W126°91.713’ N65°25.336’
GIBG-10-2-3	2010	Located between well pads on Goose Island and the Mackenzie River	W126°94.244’ N65°26.778’
GIQ8-10-2-4	2010	Located between the fuel storage and handling area on Goose Island and the Mackenzie River	W126°959.796’ N65°274.052’
Contingency Wells			
MEBG-10-1-3	2010	Central Location on the mainland. Located between the Mainland Sumps and the Mackenzie River	W126°857.963’ N65°286.081’
BI-13-1-4	2013	Located near Bear Island sump #6 (near M50X) and the Mackenzie River	W126°85.955’ N65°25.432’
GIP11-09-1-4	2009	Located between a sump and the Mackenzie River on Goose Island	W126°94.889’ N65°27.444’

Map of Groundwater-SNP Stations on Figure 2[1]

1. Sampling of Groundwater monitoring wells shall be conducted twice a year during the months of May to September.

2. The Groundwater monitoring wells selected shall be sampled for the following parameters:

Parameter	Frequency
Chloride	Twice per year
Benzene Toluene Ethylbenzene and Xylenes (BTEX)	Twice per year
ICP-MS Metal Scan (Total)[1]	Twice per year
Major Ions[2]	Twice per year

[1] IORL, Norman Wells Operation – Groundwater Management Plan, September 2014, Appendix C, Groundwater Well Locations, pg. 43.

H. Flow, Volume and Temperature Measurement Requirements

1. The following qualities shall be measured and recorded daily in cubic metres;

   a) the quantity of fresh Water pumped from the Mackenzie River;

   b) the quantity of Waste water returned to the Mackenzie River; and

   c) the quantity of Produced Water and fresh water injected into the oilfield reservoir;

2. The water temperatures shall be measured daily at SNP station S03L1-01 and S03L1-02 in degrees Celsius.

[1]ICP-MS Metal Scan shall include at a minimum, the following regulated parameters:
Aluminum, Cadmium, Chromium, Copper, Lead, Nickel, Zinc.
Once Annually the ICP shall also include the following monitored parameters:
Manganese, Molybdenum, Selenium, Strontium, Uranium.
Total metals shall be analyzed unfiltered and dissolved using a 0.45 micron filter.

[2]Major ions include the following parameters:
Calcium, Chloride, Sulphate, Magnesium, Fluoride, Potassium, Alkalinity, Hardness, Total Dissolved Solids.

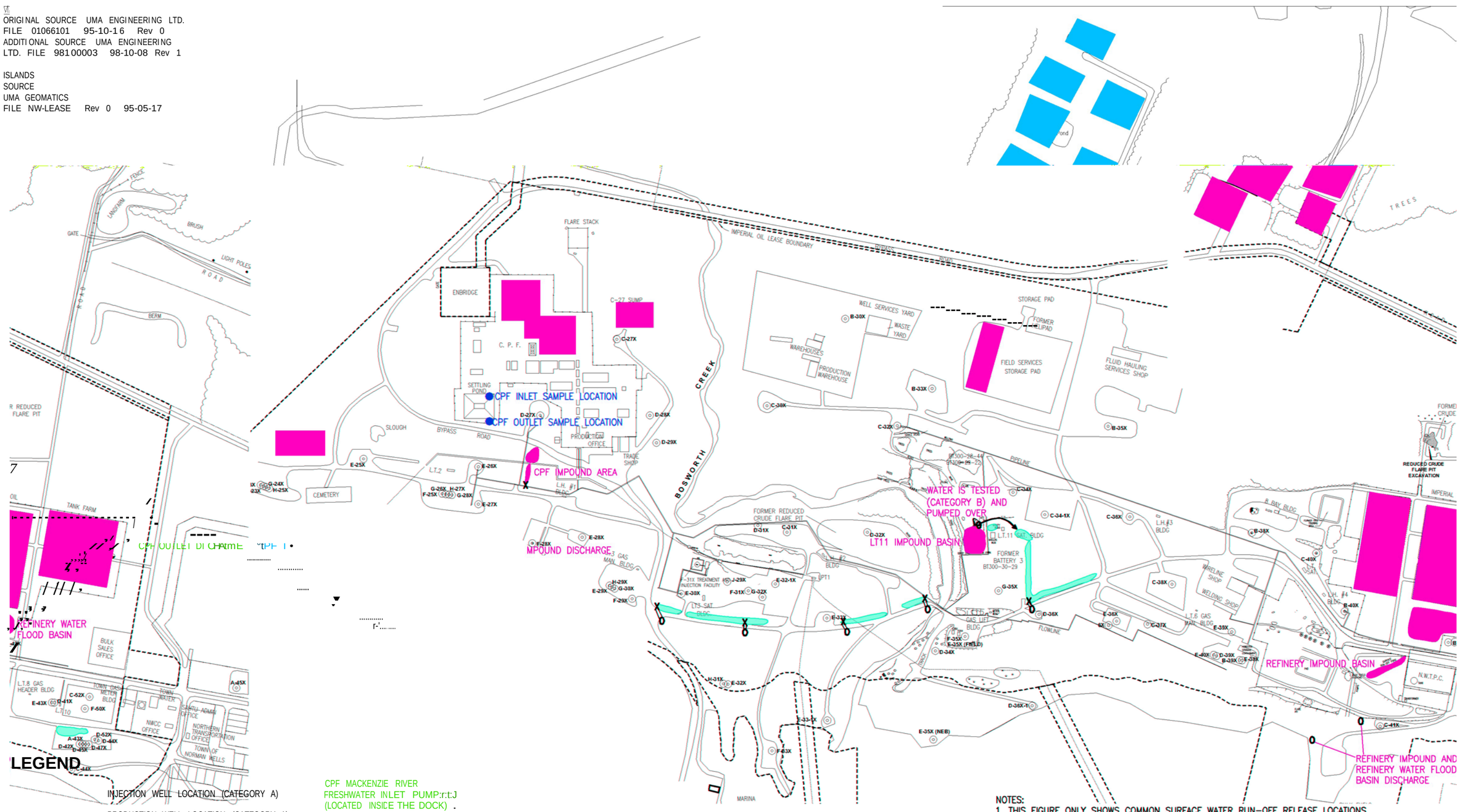
Signed the 4th day of December, 2014 on behalf of the Sahtu Land and Water Board

Witness

Mr. Larry Wallace, Chair
Sahtu Land and Water Board

VI.
ORIGINAL SOURCE UMA ENGINEERING LTD.
FILE 01066101 95-10-16 Rev 0
ADDITIONAL SOURCE UMA ENGINEERING
LTD. FILE 98100003 98-10-08 Rev 1

ISLANDS
SOURCE
UMA GEOMATICS
FILE NW-LEASE Rev 0 95-05-17



LEGEND

- INJECTION WELL LOCATION (CATEGORY A)
- PRODUCTION WELL LOCATION (CATEGORY A)
- IMPERIAL OIL LEASE BOUNDARY
- FLOWLINE R/W
- UTILIDOR LOCATION
- CPF INLET AND OUTLET SAMPLE LOCATION
- X CULVERT GATE/PUMP LOCATION
- 0 END OF PIPE/CULVERT/PUMP DISCHARGE LOCATION
- CATEGORY A SURFACE WATER RUN-OFF COLLECTION LOCATIONS
- CATEGORY B SURFACE WATER RUN-OFF COLLECTION LOCATIONS

NOTES:
1. THIS FIGURE ONLY SHOWS COMMON SURFACE WATER RUN-OFF RELEASE LOCATIONS.
2. ALL INJECTION AND PRODUCTION WELLS FOR THE ENTIRE SITE FALL UNDER CATEGORY A.

UTM NAD 27 ZONE 9

0 75 150 225 300m

SCALE 1:7,500

Infrastructure & Environment

IMPERIAL OIL RESOURCES
NORMAN WELLS RENEWAL APPLICATION FOR WATER LICENCE

SNP INLET, OUTLET AND SURFACE WATER RUN-OFF COLLECTION LOCATIONS

30-JAN-14	date	B.M.F.	edited by	M.Y.T.	drawn by	app by

PREPARED SOLELY FOR THE USE OF OUR CLIENT AS SPECIFIED IN THE ACCOMPANYING REPORT. NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH WORLEYPARSONS HAS NOT ENTERED INTO A CONTRACT.

WorleyParsons
resources & energy

PROJECT NUMBER: 307074-01618-1500

FIGURE: 1.0

Schedules for Type A Water Licence S13L1-007

Imperial Oil Resources Limited - Norman Wells Operation

Schedule 1 – Annual Report
Schedule 2 – Security Requirements
Schedule 3 – Water Use
Schedule 4 – Groundwater Management Plan
Schedule 5 – Flowline Integrity and Mackenzie River Breakup Report
Schedule 6 – AEMP Design Plan
Schedule 7 – Closure and Reclamation Report
Figure 1 – Map of Surface Water SNP Locations and Surface Water Run-off Facilities
Figure 2 – Map of Active Groundwater SNP Stations

Schedule 1

Part B: General Conditions

1. The Licensee's Annual Report required by Part B: Item 11 of the Licence shall contain the following information:

   a) the monthly and annual quantities, in cubic metres, of fresh Water(s) obtained from all sources;

   b) the monthly and annual quantities, in cubic metres, of each and all Waste discharged;

   c) the monthly and annual quantities, in cubic metres, of Waste discharged to the Mackenzie River at SNP Station S13L1-007 – 2;

   d) the monthly and annual quantities, in cubic metres, of fresh Water(s) and Produced Water injected to the Waterflood;

   e) the monthly and annual quantities, in cubic metres, of Water(s) contained and discharged from the Surface Water Run-Off Facilities;

   f) the monthly and annual quantities, in cubic metres, of Produced Water recovered from the oilfield reservoir;

   g) tabular summaries of all data generated under the **Surveillance Network Program** (SNP);

   h) a list of unauthorized discharges, identification of waterbodies affected and the current status of mitigation measures;

   i) an annual drilling schedule for the upcoming year to the Board with locations of each well;

   j) the annual amounts in cubic metres of Waste(s) generated from all drilling activities;

   k) a summary of the measures taken to minimize net Water(s) withdrawals from all sources as required by Part D: Item 4 of the Licence;

   l) details on the handling, storage, treatment and disposal of all Waste(s) generated by project activities;

m) a review of spill training and communication exercises of the previous year, including the successes and failures, as well as recommendations for improvement;

n) a general schedule for any planned oil spill exercises for the following year;

o) a summary of any Modification(s) and/or major maintenance work carried out as per Part G of the Licence;

p) any other details on Water(s) use or Waste(s) disposal requested by the Board no later than March 31st of the year following the calendar year reported; and

q) a summary of all spills and Unauthorized Discharges and follow-up actions taken that occurred during the previous calendar year.

Schedule 2

Part C: Conditions Applying to Security

1. The Licensee shall post and maintain a security deposit of CDN $178,883,606.00 ($180,883,606.00 less $2,000,000.00 existing security) for the Imperial Oil Resources Norman Wells Operation, in accordance with Section 72.11 of the Act and Part C of this Licence.

Schedule 3

Part D: Conditions Applying to Water Use

1. The Licensee shall not exceed the total allowable Water(s) withdrawal limit of 3,500,000 cubic metres per year, and shall not exceed the withdrawal rate of 16,000 cubic metres per day.

Schedule 4

Part E: Conditions Applying to Waste and Water Management

1. The Licensee's **Groundwater Management Plan** shall contain the following information:

    a) an assessment of available baseline information;

    b) a plan to collect additional information necessary to establish baseline conditions for Groundwater monitoring wells;

    c) proposed criteria for all sampled parameters that indicate contamination;

    d) identification of Groundwater monitoring wells that show contamination;

    e) identification of Groundwater monitoring wells that are indicating a trend towards contamination before end of operations; and

    f) a detailed response plan to address contaminated and potentially contaminated Groundwater.

Schedule 5

Part F: Conditions Applying to Operation and Maintenance

1. The Licensee's Annual **Flowline Integrity and Mackenzie River Breakup Report** required by Part F, Item 6 of the Licence shall contain the following information:

    a) The results of inspections of the physical condition of each Artificial and Natural Island, including channel erosion, island scour holes and erosion, Flowline landfalls, the condition of rip rap and the following information:

        i. locations, depth, and volume of channel scour in the vicinity of any Flowline(s);

        ii. locations and magnitude of Artificial Island slope erosion;

        iii. locations and severity of Artificial Island rip rap disturbance;

        iv. structural integrity of the Artificial Islands, and other related structures; and

        v. structural integrity of the Natural Islands where it is applicable to project activities.

    b) The dates and results of Flowline(s) and fuel storage tank integrity tests; and

    c) Details on necessary repair and maintenance work along with a schedule for completing such work prior to the following spring Mackenzie River Breakup period.

Schedule 6

Part I: Conditions Applying to Aquatic Effects Monitoring

1. Within 90 days after the effective date of the Licence, the Licensee shall develop a **Special Effects Study** which addresses the following:

    a) validation that visible sheen is an effective indicator of the lack of hydrocarbons; and

    b) to establish any threat posed by metals and ions in surface or groundwater by monitoring in the Mackenzie River, upstream of the facility and at the groundwater SNP sites listed in Annex A, Part G, for a period of two years (minimum 12 samples), and submit to the Board for approval.

2. Upon Board approval of the **Special Effects Study** the Licensee shall submit a report to the Board with recommendations on the need for EQC based on the results of the monitoring and trend analysis three months following end of sampling.

Schedule 7

Part J: Conditions Applying to Closure and Reclamation

1. The Licensee's **Annual Closure and Reclamation Report** required by Part J, Item 4 of the Licence shall contain the following information, if applicable to closure and Reclamation work:

   a) a summary of any closure and Reclamation work completed during the year and an outline of any work anticipated for the next year;

   b) activities related to the Water Intake facilities and Water(s) distribution infrastructure;

   c) activities related to Waste disposal sites and facilities;

   d) activities related to the petroleum, chemical, and/or hazardous Waste storage areas;

   e) details related to the restoration of natural drainage and stream banks related to Project activities;

   f) details related to the extent of soil and Groundwater impacts and proposed Remediation;

   g) activities related to the oil collection system, especially any Flowline(s);

   h) activities related to Surface Water Run-Off Facilities;

   i) details on any site affected by unauthorized discharges and/or releases;

   j) activities related to Waterflood facilities and/or infrastructure;

   k) activities related to the Central Processing Facility;

   l) activities related to the Artificial and Natural Islands;

   m) activities related to the former refinery area and associated infrastructure;

   n) activities related to the Groundwater Treatment Facilities;

   o) details on any other facility or infrastructure which could potentially impact land and/or Water(s);

   p) cataloguing of all closed wells and sumps, identifying the status of each, including any planned mitigation measures;

   q) activities related to revegetation; and

   r) post-closure monitoring plans for any facility and/or infrastructure.

Appendix 2 List of Acronyms, Abbreviations and Definitions



Appendix 2 List of Acronyms, Abbreviations and Definitions

Al	Aluminum
As	Arsenic
Attenuation mechanisms	Several mechanisms tend to slow the forward migration of dissolved phase constituents (hydrocarbon compounds, metals, anions and cations, etc.) compared to water molecules as they migrate through porous soils or bedrock. Specifically, these mechanisms include intrinsic biodegradation, sorption on hydrophobic or charged particle surfaces, hydrodynamic dispersion, and molecular diffusion. Each dissolved constituent will experience a different degree of attenuation or retardation as it migrates, depending on the geochemical properties of both the specific chemical parameter and the porous media through which it is travelling.
Ba	Barium
Be	Beryllium
bgs	Below-ground surface
BIT	Bear Island terminal
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCME	Canadian Council of Ministers of the Environment
Cd	Cadmium
Co	Cobalt
Cr, Cr^{6+}	Chromium and Hexavalent Chromium
Cu	Copper
Dissolved phase hydrocarbon	Some of the more soluble compounds within a hydrocarbon LNAPL will tend to dissolve into groundwater. These typically include BTEX compounds, PHC-F1, and PHC-F2 fractions.
DPE	Dual phase extraction, an in-situ remediation method involving a combination of groundwater extraction and application of high vacuum to remove vapour phase hydrocarbon
Drivepoint	A shallow groundwater monitoring well that is installed without a drill rig, using a post pounder to push the well 1 to 2 m deep into soft ground, often near a muskeg or riverbank.
dS/m	deci-Siemens per metre
EC	electrical conductivity
EM	Electromagnetic, referring to geophysical surveys

ERT	Electrical resistance tomography, a type of geophysical survey
ESA	Environmental Site Assessment
Free phase hydrocarbon	Also defined as LNAPL. This is hydrocarbon liquid that forms a separate oily phase, which typically floats above groundwater. It may originate from either anthropogenic or natural sources.
FTA	Fire Training Area
FWAL	Freshwater Aquatic Life
GIT	Goose Island terminal
Hg	Mercury
IES	Imperial Environmental Services
IOR	Imperial Oil Resources
kg	Kilogram
L	Litre
LNAPL	Light non-aqueous phase liquid
LT	Land terminal
M or m	Metres
µg/L	micrograms per litre
mg/L	milligrams per litre
mg/kg	milligrams per kilogram
Mo	Molybdenum
MPE	Multiphase extraction, an in situ remediation method involving application of high vacuum to remove vapour phase and liquid hydrocarbons simultaneously through the same intake tube
Ni	Nickel
NT	Northwest Territories
OVA	Organic vapour analyzer
Pb	Lead
PAHs	Polycyclic Aromatic Hydrocarbons
PHC-F1	CCME Petroleum hydrocarbon fraction F1, covering the range from C_6 to C_{10}
PHC-F2	CCME Petroleum hydrocarbon fraction F2, covering the range from $C_{>10}$ to C_{16}
PHC-F3	CCME Petroleum hydrocarbon fraction F3, covering the range from $C_{>16}$ to C_{34}
PHC-F4	CCME Petroleum hydrocarbon fraction F4, covering the range from $C_{>34}$ to C_{50+}

PPM or ppm	parts per million
RCFP	Reduced Crude Flare Pit
SAR	Sodium adsorption ratio
Se	Selenium
Subsidence Area	An area of collapsed ground created by uneven settling, sometimes associated with buried sumps
SVE	Soil vapour extraction an in-situ remediation method involving application of vacuum to remove vapour phase hydrocarbon
TDS	Total dissolved solids
Tl	Thallium
TEH	Total extractable hydrocarbon, an analysis for semi-volatile and non-volatile hydrocarbon fractions typically covering the ranges C_{11} to C_{30} or C_{11} to C_{60}
TPH	Total purgeable hydrocarbon, an analysis for volatile hydrocarbon fraction typically covering the range from C_3 to C_{12}
V	Vanadium
Zn	Zinc

Appendix 3 Soil and Groundwater Geochemical Background Conditions



Imperial

Background Geochemical Statistical Summary (Appendix 3)

Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0006

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0006 - Background Geochemical Statistical Summary (Appendix 3): Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as fnal	M. Brown	A. Glatiotis	S. Gibb	31-May-18

Contents

1. Introduction and Methodology 1

1.1 Introduction 1

1.2 Background Sampling Location Selection 1

1.2.1 Soil and Bedrock 1

1.2.2 Groundwater 2

1.3 Analytical Data Compilation & Screening 3

1.3.1 Statistical Trend Analyses 3

1.3.2 Outliers Assessment 3

1.3.3 Statistical Analysis of Data 3

2. Summary of Key Findings 4

2.1 Soil Statistical Background 4

2.2 Bedrock Statistical Background 4

2.3 Groundwater Statistical Background 5

2.4 Natural Seepage Zones Statistical Background 5

3. References 7

Figures

Figure 1 Background Monitoring Well Locations (Mainland)

Figure 2 Background Monitoring Well Locations (Islands)

Figure 3 Background Soil/Bedrock Sampling Locations (Mainland)

Figure 4 Background Soil/Bedrock Sampling Locations (All Areas)

Tables

Table 1 Background Soil/Bedrock Sampling Locations (1998-2016)

Table 2 Background Groundwater Sampling Locations (1997-2017)

Table 3 Soil and Bedrock Background Geochemical Statistical Summary (1998-2016)

Table 4 Natural Seeps Soil and Bedrock Background Geochemical Statistical Summary (1998-2016)

Table 5 Groundwater Indicator Parameters - Background Geochemical Statistical Summary (1997-2017)

Table 6 Groundwater Dissolved Metals - Background Geochemical Statistical Summary (1997-2017)

Table 7 Groundwater PHCs - Background Geochemical Statistical Summary (1997-2017)

Table 8 Groundwater PAHs - Background Geochemical Statistical Summary (1997-2017)

1. Introduction and Methodology

1.1 Introduction

Soil, bedrock, and groundwater analytical results from numerous Phase II Environmental Site Assessments (ESAs) conducted to date within the Norman Wells Field (the Site) have indicated that there are concentrations of select hydrocarbon, salt and metals parameters in certain lithologic / stratigraphic units that are naturally elevated above generic federal and territorial environmental quality guidelines. Understanding background (pre-industrial disturbance) environmental quality is required to properly evaluate site characterization data, and determine appropriate site remediation objectives and endpoints for the Norman Wells Field. The evaluation of background geochemical conditions is complicated by the presence of natural crude oil, gas, and saline water seepage in several Mainland areas of the Site.

This document includes a summary review and assessment of available data with the objective of determining background soil, bedrock and groundwater geochemical conditions, both within the natural seepage areas and outside of them, for the primary near surface (i.e. upper 20 metres (m)) lithologic / stratigraphic units present within the Norman Wells Field. To provide context the statistically evaluated results are compared to appropriate CCME federal regulatory guidelines for soil and groundwater quality, as summarized in the main text of this report.

1.2 Background Sampling Location Selection

1.2.1 Soil and Bedrock

The majority of the background soils/bedrock data was collected between 1998 and 2016. Data were collected for a range of environmental projects and it is possible that a location considered suitable for background purposes for a groundwater or subsurface soils investigation may not necessarily provide suitable background surface soils data due to disturbance of surface soils, or due to the presence of shale fill material. Only data from those background locations considered to have minimal or no potential industrial impact were included in the background assessment.

Background soil and bedrock sampling locations are shown on Figures 3-4, and summarized on Table 1. For the purposes of the Norman Wells environmental background assessment, soil and bedrock background locations were summarized into the following general categories / stratigraphic units:

- Surface organic soil generally above 0.5 mbgs:
  - Mainland (17 locations, 17 samples);
  - Mainland Seeps (4 locations, 4 samples); and
  - Islands (4 locations, 5 samples).
- Surface mineral soil (generally upper 0.5 m of soil profile):
  - Mainland (15 locations, 18 samples);
  - Mainland Seeps (5 locations, 8 samples); and

  - Islands (14 locations, 14 samples).
- Subsurface mineral soil (> 0.5 m below ground surface [bgs] to bedrock contact):
  - Mainland (28 locations, 53 samples);
  - Mainland Seeps (4 locations, 8 samples); and
  - Islands (19 locations, 45 samples).
- Bedrock:
  - Siltstone on Mainland (10 locations, 11 samples);
  - Mainland Seeps (2 locations, 4 samples); and
  - Shale Fill Material from Quarry (4 locations, 4 samples).

There were no natural seepage areas identified on the Islands and no bedrock was encountered or sampled during intrusive investigations on the Islands.

1.2.2 Groundwater

Background monitoring wells would ideally be installed in an undisturbed, up-gradient area, isolated from any potential sources of anthropogenic impact. However, these locations tend to be heavily influenced by permafrost in the vicinity of Norman Wells. Previous attempts to install background wells in up-gradient areas of the lease, removed from the Imperial facilities and in areas of natural vegetation, have resulted in rapidly frozen groundwater monitoring wells that consistently remain frozen. As such, the use of the term "background" in this report does not necessarily mean the groundwater monitoring well is installed in an undisturbed, up-gradient area. Rather, the term is used for locations inferred to be removed from site facilities and free of facility-related impacts.

Background groundwater sampling locations are shown on Figures 1-2, and summarized on Table 2. These background wells are separated into five groups, as follows. These groups are based on the hydrogeological zone where the monitoring well screen is completed, as well as evidence for the presence or absence of natural seepage in the vicinity:

- Surficial sediments on Mainland (14 wells, total of 64 samples);
- Surficial sediments on Natural Islands (10 wells, total of 65 samples);
- Shallow bedrock on Mainland inferred to represent natural saline water and hydrocarbon seepage (7 wells, total of 69 samples);
- Surficial sediments on Mainland inferred to represent natural saline water and hydrocarbon seepage (5 wells, total of 27 samples); and
- Surficial sediments on Mainland inferred to represent natural gas seepage without saline water (4 wells, total of 30 samples).

1.3 Analytical Data Compilation & Screening

1.3.1 Statistical Trend Analyses

Statistics were evaluated generally following protocols in U.S. EPA Unified Guidance (2009). Statistical trend analyses were used to evaluate temporal changes in key parameters at background locations for groundwater samples. A similar analysis could not be done on soil/bedrock data since these results do not have a temporal history, as they are derived from one-time drilling and sampling events. The presence of statistically significant temporal trends would suggest facility-related water quality impacts, meaning that the monitoring well in question may not be suitable as a background location. Key parameters considered for trend analyses were benzene, toluene, ethylbenzene, arsenic, copper, cadmium, iron and chloride.

The analysis was performed using the non-parametric Mann-Kendall trend test (Mann 1945; Kendall 1975; Gilbert 1987). The purpose of the Mann-Kendall (MK) test is to statistically assess if there is an upward or downward trend of the variable of interest over time. In each case, the trend analysis was conducted using the available data series from 2007 to 2013. The Mann-Kendall test was performed on data sets where at least four data points were available. To identify potentially significant trends, the trend analysis data was filtered using the probability of the trend: a probability of 95% or greater was used as the first level of screening, based on the statistical convention of $p < 0.05$ for rejection of the null hypothesis of "no trend".

1.3.2 Outliers Assessment

High outliers were reviewed for each sample group. High outliers were defined as data points which exist at three times the interquartile range (IQR) of the data set above the 75th percentile (> P75+3*IQR) for one of the analyzed parameters (AMSRP 2008). The IQR is the 75th percentile minus the 25th percentile (P75 - P25).

Samples detected as high outliers were reassessed by checking against the borehole log, location, other samples from the location, typographical error, and laboratory error. Samples deemed to be not impacted (false outliers) were still considered for the calculation of background statistical values while real outliers (potentially impacted or not reliable) were removed.

1.3.3 Statistical Analysis of Data

One of the key aspects of the statistical calculations is the method of dealing with results reported below the laboratory method detection limit (MDL), which is a frequent occurrence with some of the dissolved trace metals and hydrocarbons in particular. In order to calculate statistical values, a real number is required rather than a "less than" result. In the background statistical calculations analytical results reported below the MDL were conservatively considered as real numbers at the MDL value.

A geometric mean, minimum, maximum, and 95th percentile value for each parameter of interest was determined for each of the soil, bedrock and groundwater groups of interest.

2. Summary of Key Findings

2.1 Soil Statistical Background

Based on the review of the available statistical background data, the following general trends were inferred from data summarized on Table 3:

- Concentrations of one or more metals/trace elements (As, Mo, Ni, Se and Tl) exceeding CCME Industrial use guidelines have been confirmed in background organic surface soil and mineral subsurface soil on the Mainland.
- Above guideline SAR values have been measured / calculated for a limited number of mineral subsurface soil samples on the Mainland.
- In the Island soils, background metals concentrations in surface mineral soil are typically below CCME Parkland use guidelines. However, Mo may be present at concentrations above guidelines in the subsurface soil.
- EC levels above CCME Parkland use guidelines (2 dS/m) may be present in both organic and mineral soil on the Islands. The EC is typically associated with concentrations of sulphate, calcium and magnesium ions (considered to be naturally occurring) rather than chloride (considered to be an indicator of industrial activities).
- One or more BTEX and PHC F1 through F4 parameter concentrations above detection limits but generally below CCME guidelines have been reported in all strata and may be associated with organic matter and / or hydrocarbon seeps at the bedrock / soil interface, particularly in close proximity to the Mackenzie River.
- Background data sets for the organic and mineral surface soil on the Islands and natural seeps areas on the Mainland are limited and should be interpreted / referenced with caution.

2.2 Bedrock Statistical Background

General trends in bedrock geochemistry are based on a limited data set, and the following conclusions are derived from the data in Table 3:

- Concentrations of one or more metals/trace elements (As and Ni) exceeding CCME Industrial use guidelines have been confirmed in siltstone bedrock on the Mainland.
- Concentrations of As, Mo, Se and Tl exceeding CCME Industrial use guidelines have also been confirmed in shale bedrock samples collected from the Town of Norman Wells quarry. This shale material is used as fill throughout the Site and the adjacent Town.
- Above CCME Industrial use guideline SAR values have been measured / calculated for a limited number of siltstone bedrock samples from the Mainland.
- Background data sets for the bedrock are limited and should be interpreted / referenced with caution.

2.3 Groundwater Statistical Background

In terms of groundwater geochemistry, key characteristics noted for groundwater background locations in surficial sediments on both the Mainland and Islands areas are summarized below. Characteristics related to natural seepage areas are considered separately in Section 2.4 below:

- nitrate, nitrite and phenols levels were close to or exceeded the applied CCME Freshwater Aquatic Life (FWAL) guidelines in the near surface groundwater (Table 5);
- concentrations of several metals/trace elements (As, Cd, Cu, Fe, Pb, Hg, Se, Ag, Tl, U) exceeding CCME FWAL guidelines have been confirmed in shallow groundwater at Mainland locations (Table 6);
- at Islands background locations, a shorter list of metals/trace elements with groundwater concentrations exceeding CCME FWAL guidelines (Cd, Cu, Fe, U) is identified (Table 6);
- concentrations of PHC and/or PAH parameters are generally non-detectable in shallow groundwater background locations on the Islands, and at Mainland locations which are not identified as natural seepage zones (Tables 7, 8).

2.4 Natural Seepage Zones Statistical Background

General trends in soil and bedrock geochemistry for natural seeps areas are based on a limited data set, and include the following preliminary conclusions as summarized in Table 4:

- Soil/bedrock concentrations of one or more metals/trace elements (As and Ni) exceeding CCME Industrial use guidelines have been confirmed in natural seeps organic surface soil and mineral subsurface soil and/or bedrock on the Mainland.
- One or more natural seeps soil samples contained concentrations of benzene, PHC F1, PHC F2, PHC F3, and/or select PAHs (fluorene, naphthalene, phenanthrene) exceeding CCME guidelines for industrial and/or parkland use. Hydrocarbon concentrations appear to increase with depth in the natural seep areas.
- SAR levels in one or more natural seep mineral subsurface soil samples exceeded CCME parkland use guidelines.

In terms of groundwater geochemistry, key characteristics noted for the natural seepage zones are summarized below:

- chloride and phenols levels exceeded the applied CCME FWAL guidelines in the natural oil seeps in both upper bedrock and surficial sediments (Table 5);
- seeps identified as related to natural gas without saline water also exceeded the phenols guideline, but had chloride levels more typical of background non-seep surficial sediments (Table 5);
- concentrations of several metals/trace elements (Al, As, Cd, Cu, Fe, Pb, Hg, Se, Tl, U, Zn) exceeding CCME FWAL guidelines have been confirmed in groundwater near natural oil and gas seeps from both upper bedrock and surficial sediments (Table 6); and
- concentrations of several PHC and PAH parameters are detected in groundwater near natural oil and gas seeps, with toluene, anthracene, benzo(a)anthracene, benzo(a)pyrene, fluoranthene, naphthalene,

phenanthrene and pyrene exceeding CCME FWAL guidelines based on the statistical analyses. Benzene may also exceed the applied guideline in the inferred natural gas seeps, but is generally lower in the oil-related seeps (Tables 7, 8).

3. References

AMSRP (Abandoned Military Site Remediation Protocol), 2008. Abandoned Military Site Remediation Protocol. Vol II – Technical Supporting Documentation. Indian and Northern Affairs Canada (INAC) Contaminated Site Program. December 2008.

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring, Wiley, NY.

Mann, H.B. 1945. Non-parametric tests against trend, Econometrica 13:163-171.

Kendall, M.G. 1975. Rank Correlation Methods, 4th edition, Charles Griffin, London.

U.S. EPA Unified Guidance 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009. EPA 530/R-09-007. United States Environmental Protection Agency, Office of Resource Conservation and Recovery.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion.

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-SITE_PHOTOMOSAIC.DWG



LEGEND

- BACKGROUND MONITORING WELL LOCATION

NAD27 UTM ZONE 9N

m 0 500 1000 m

1:20000

IMPERIAL

APPENDIX 3 - BACKGROUND GEOCHEMICAL STATISTICAL SUMMARY

NORMAN WELLS, NT

BACKGROUND MONITORING WELL LOCATIONS (MAINLAND)

Date:	Drawn by:	Edited by:	App'd by:
23-MAY-18	MYT	B.M.F.	

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

FIG No 1

REV C

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 23/5/2018 11:35:54 AM USER NAME: blair.fink
SAVE DATE & TIME: 23/5/2018 11:33:03 AM ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-SITE_PHOTOMOSAIC.DWG



LEGEND

- BACKGROUND MONITORING WELL LOCATION

NAD27 UTM ZONE 9N

m 0 500 1000 1500 m

1:25000

IMPERIAL

APPENDIX 3 - BACKGROUND GEOCHEMICAL STATISTICAL SUMMARY

NORMAN WELLS, NT

BACKGROUND MONITORING WELL LOCATIONS (ISLANDS)

Date:	Drawn by:	Edited by:	App'd by:
23-MAY-18	MYT	B.M.F.	

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

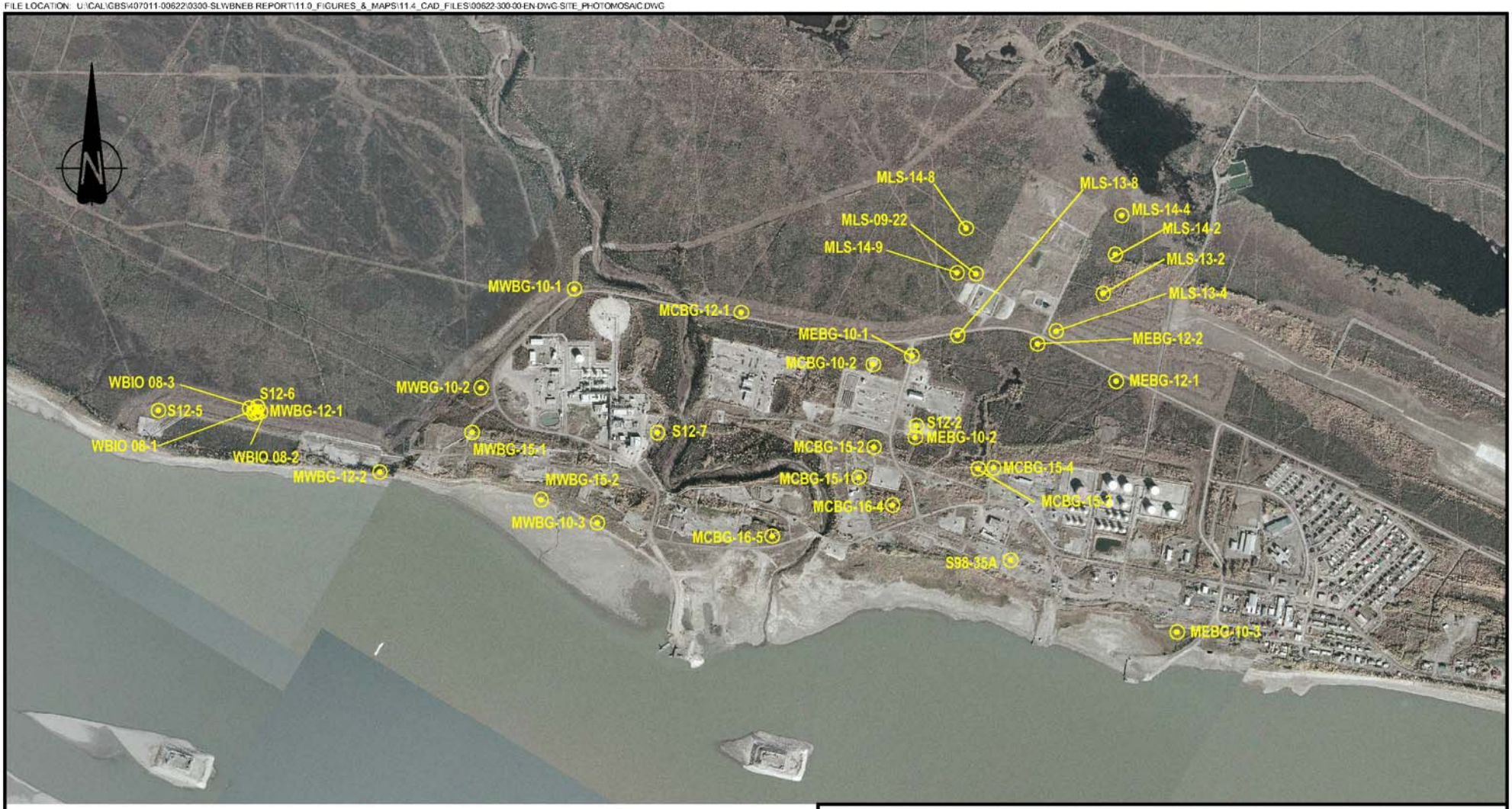
FIG No: 2

REV: B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 23/5/2018 11:47:21 AM USER NAME: blair.fink
SAVE DATE & TIME: 23/5/2018 11:33:03 AM ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-SITE_PHOTOMOSAIC.DWG



LEGEND

- BACKGROUND SOIL/BEDROCK SAMPLE LOCATION

NAD27 UTM ZONE 9N

m 0 500 1000 m

1:20000

IMPERIAL

APPENDIX 3 - BACKGROUND GEOCHEMICAL STATISTICAL SUMMARY

NORMAN WELLS, NT

BACKGROUND SOIL/BEDROCK SAMPLING LOCATIONS (MAINLAND)

Date:	23-MAY-18	Drawn by:	MYT	Edited by:	B.M.F.	App'd by:	

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-300

FIG No 3 | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 23/5/2018 11:51:09 AM USER NAME: blair.fink
SAVE DATE & TIME: 23/5/2018 11:33:03 AM ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0300-SLWBNEB REPORT\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-300-00-EN-DWG-SITE_PHOTOMOSAIC.DWG



LEGEND

- BACKGROUND SOIL/BEDROCK SAMPLE LOCATION

NAD27 UTM ZONE 9N

m 0 500 1000 2500 m

1:50000

IMPERIAL

APPENDIX 3 - BACKGROUND GEOCHEMICAL STATISTICAL SUMMARY

NORMAN WELLS, NT

BACKGROUND SOIL/BEDROCK SAMPLING LOCATIONS (ALL AREAS)

Date:	23-MAY-18	Drawn by:	MYT	Edited by:	B.M.F.	App'd by:	

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622-300

FIG No: 4 REV: B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 23/5/2018 11:54:27 AM USER NAME: blair.fink
SAVE DATE & TIME: 23/5/2018 11:33:03 AM ISSUING OFFICE: eCAD

Tables



Advisian
WorleyParsons Group

Table 1
Background Soil / Bedrock Locations (1998-2016)

AREA	LOCATIONS							
	Organic Surface Soil		*Mineral Surface Soil*		*Mineral Subsurface Soil*		*Bedrock*	
	Borehole ID	Sample Depths	Borehole ID	Sample Depths	Borehole ID	Sample Depths	Borehole ID	Sample Depth
Mainland	P98-35A	0.0-0.15 m	MCBG-12-1	0.1-0.5 m	CLAY PIT#1	Surface	**SILTSTONE**	
	MCBG-10-02	0.3-0.6 m	MLS-09-22	0.0-0.4 m	CLAY PIT#2	Surface	MEBG-12-2	3.5-4.0 m
	MEBG-10-01	0.0-0.3 m	MWBG-12-2	0.3-0.6 m	A45X OVERBURDEN 1	Surface	MWBG-10-01	2.4-2.7 m
	MEBG-12-1	0.0-0.3 m	S12-2D	0.3-0.35 m	A45X OVERBURDEN 2	Surface	MWBG-12-2	2.0-2.2 m
	MEBG-12-2	0.2-0.5 m	S12-2E	0.3-0.35 m	WBIO 08-1	0.76-1.5, 2.3-3.0 m	MLS-13-4	2.0-2.2 m; 2.8-3.0 m
	MWBG-10-01	0.0-0.3 m	S12-2F	0.3-0.35 m	WBIO 08-2	0.76-1.5, 2.3-3.0 m	MLS-14-4	3.0 m
	MWBG-10-02	0.0-0.3 m	S12-5D	0.5-0.6 m	WBIO 08-3	0.76-1.5, 3.0-3.8 m	MLS-14-8	3.0 m
	MWBG-12-1	0.0-0.4 m	S12-6D	0.1-0.2; 0.3-0.4 m	MCBG-10-02	0.6-1.0 m; 1.5-2.0 m	MLS-14-9	3.0 m
	S12-2D	0.15-0.3 m	S12-6E	0.1-0.2; 0.3-0.4 m	MCBG-12-1	0.6-0.9 m; 1.0-1.5 m; 1.7-2.1 m	MWBG-15-2	2.4-3.0 m
	S12-2E	0.15-0.3 m	S12-6F	0.1-0.2; 0.3-0.4 m	MEBG-10-01	0.3-0.6 m; 0.6-1.0 m; 2.5-3.0 m	MLS-14-2	2-2.5 m
	S12-2F	0.15-0.3 m	MCBG-15-2	0.1-0.3 m	MEBG-10-2	0.3-0.6 m; 0.6-1.0 m; 1.8-2.3 m; 2.5-3.0 m	P98-35A	2.0-3.0 m
	S12-5D	0.1-0.2 m	MWBG-15-1	0.1-0.3 m	MEBG-12-1	1.5-2.0 m; 3.0-3.4 m		
	MLS-13-8	0.5-0.7 m	MWBG-10-01	0.3-0.6 m	MEBG-12-2	1.0-1.5 m; 2.0-2.5 m		
	MLS-14-4	1.0 m	MWBG-10-02	0.3-0.6 m	MWBG-10-01	0.6-1.0 m		
	MWBG-15-1	0.0-0.1 m	MLS-14-2	1 m	MWBG-10-02	0.6-1.0 m; 2.4-2.7 m		
	MCBG-15-2	0.0-0.1 m			MLS-09-22	1.0-1.3 m		
	MEBG-10-2	0.0-0.3 m			MWBG-12-1	0.4-0.8 m; 1.5-2.0 m		
					MLS-13-2	1.5-1.7 m; 2.0-2.2 m		
					MLS-13-4	1.2-1.5 m	**SHALE**	
					MLS-13-8	1.3-1.5 m; 2.8-3.0 m	S12-Quarry 1	Surface
					MLS-14-4	2.0 m	S12-Quarry 2	Surface
					MLS-14-8	1.0 m; 2.0 m	S12-Quarry 3	Surface
					MLS-14-9	1.0 m; 2.0 m	SHALE-1	Surface
					MCBG-15-2	0.3-0.5 m; 2.4-3.0 m		
					MWBG-15-1	0.3-0.8 m; 1.8-2.4 m		
					MLS-14-2	2 m		
					MCBG-16-4	0.7-1.1 m; 2.4-3.0 m; 4.0-4.5 m		
					MEBG-16-5	0.6-1.2 m; 2.5-3.0 m; 4.2-4.8 m		
Mainland Natural Seepage Zones	MEBG-10-3	0.0-0.3 m	MCBG-15-1	0.1-0.3 m; 0.3-0.5 m	MWBG-10-03	0.6-1.0; 2.2-2.7 m; 4.0-4.5 m	MCBG-15-1	4.2-4.8 m
	MCBG-15-1	0.0-0.1 m	MWBG-10-03	0.0-0.3 m; 0.3-0.6 m	MEBG-15-3	0.5-1.2 m; 2.4-3.0 m	MEBG-10-3	0.3-0.6 m; 0.6-1.0 m; 2.5-3.0 m
	MEBG-15-3	0.0-0.1 m	MEBG-15-3	0.1-0.5 m	MEBG-15-4	0.5-0.8 m; 1.8-2.4 m		
	MEBG-15-4	0.0-0.2 m	MEBG-15-4	0.2-0.5 m	MWBG-15-2	2.4-3.0 m		
			MWBG-15-2	0.0-0.15 m; 0.15-0.6 m				
Bear / Frenchy's/Goose Islands	BI 08-01	0.0-0.3 m	BIBG-10-3	0.0-0.3 m	BI 08-01	0.8-1.2 m; 2.0-2.4 m	NA	NA
	BIBG-15-1	0.0-0.05 m; 0.05-0.4 m	BIBG-10-2	0.0-0.3 m	BIBG-10-3	0.3-0.6 m; 0.6-1.0 m; 1.8-2.1 m; 4.2-4.5 m		
	BIBG-15-2	0.0-0.4 m	FIBG-10-1	0.0-0.3 m	BIBG-10-2	0.3-0.6 m; 0.6-1.0 m; 2.5-3.0 m; 4.0-4.5 m		
	BIBG-15-3	0.0-0.2 m	GIBG-10-1	0.0-0.3 m	BIBG-10-1	0.9-1.2 m; 1.2-1.5 m; 1.5-1.8 m; 4.0-4.3 m		
			GIBG-10-2	0.0-0.3 m	BIBG-12-1	0.5-0.8 m; 2.7-3.0 m; 4.2-4.5 m; 6.0-6.5 m; 7.0-7.5 m		
			S12-8D	0.1-0.2 m	BIBG-12-2	1.0-1.5 m; 3.5-4.0 m; 4.5-5.0 m		
			S12-9D	0.2-0.3 m	FIBG-10-1	0.3-0.6 m; 0.6-1.0 m; 2.3-2.8 m		
			BIBG-15-1	0.4-0.8 m	GIBG-10-1	0.3-0.6 m; 0.6-1.0 m; 2.5-3.0 m		
			BIBG-15-2	0.4-0.8 m	GIBG-10-2	0.3-0.6 m; 0.6-1.0 m; 1.8-2.3 m; 3.0-3.3 m		
			BIBG-15-3	0.2-0.5 m	S12-8D	0.5-0.6 m		
			GIBG-15-13	0.6 m	BIBG-15-1	1.8-2.4 m		
			GIBG-15-14	0.3 m	BIBG-15-2	1.8-2.4 m		
			GIBG-15-15	1.0 m	BIBG-15-3	0.5-1.0 m		
			GIBG-15-16	0.3 m	BIBG-15-3	1.8-2.4 m		
					GIBG-15-13	0.8 m; 4.8 m		
					GIBG-15-14	1.8 m; 3.6 m		
					GIBG-15-15	3.5 m		
					GIBG-15-16	1.8 m; 3.2 m		
					BIBG-16-12	1.0-1.3 m		

Notes:
NA = not applicable. No bedrock or seeps observed/sampled on Natural Islands.

Advisian
WorleyParsons Group

Table 2
Background Groundwater Sampling Locations (1997-2017)

Monitoring Well	Original Location Code (soil borehole / piezometer)	Depth Interval of Sandpack (m bgs)	Hydrogeologic Unit	Lithology Within Screened Interval
Background – Surficial Sediments - Not Associated with Natural Seepage Zones				
Mainland Locations - Surficial Sediments				
B38 93-2-4	B38 93-2-4	less than 4 m	Surficial sediment	no borehole log
BT3 97-2-5	BT3 97-2-5	1.10 - 4.60	Surficial sediment	Silt
MCBG-10-1-3	MCBG-10-02 / 10-1-3	0.80 - 2.50	Surficial sediment	Clayey Silt / Peat / Silty Clay
MCBG-12-1-2	MCBG-12-1 / BH-12-1-2	0.50 - 3.00	Surficial sediment	Topsoil, Sand, Silty Clay
MEBG-10-1-3	MEBG-10-2 / 10-1-3	1.00 - 3.00	Surficial sediment	Silty Sand / Clayey Silt
MEBG-12-2-3	MEBG-12-2 / 12-2-3	0.80 - 3.00	Surficial sediment	Silty Clay and Bedrock
MLS 09-6-2	MLS 09-06-2	0.80 - 2.20	Surficial sediment	Silty clay and bedrock
MLS-13-9-3	MLS-13-9 / MLS-13-9-3	0.90 - 2.40	Surficial sediment	
MLS-14-3-3	MLS14-3 / MLS-14-3-3	1.50 - 3.00	Surficial sediment	Silt
MLS-14-4-3	MLS14-4 / MLS-14-4-3	1.50 - 3.00	Surficial sediment	Clayey silt, silt and gravel
MLS-14-8-3	MLS14-8 / MLS-14-8-3	1.50 - 3.00	Surficial sediment	Clayey silt
MWBG-10-1-3	MWBG-10-02 / 10-1-3	0.80 - 2.70	Surficial sediment	Silt / Clay
MWBG-12-1-3	MWBG-12-2 / 12-1-3	1.20 - 3.00	Surficial sediment	Silt and Siltstone
WBIO 08-1-2	WBIO 08-1-2	0.60 - 2.40	Surficial sediment	Sandy clay / Silty sand
Bear and Frenchy's Island Locations - Surficial Sediments				
BI 08-1-4	BI 08-1-4	0.60 - 2.40	Surficial sediment	Silty clay
BI-13-6-2	BI-13-6 / 13-6-2.4	0.60 - 2.70	Surficial sediment	Silt and Clayey silt
BI-14-8-3	BI-14-8 / 14-8-3	1.66 - 3.16	Surficial sediment	Silty clay
BIBG-10-1-4	BIBG-10-3 / 10-1-4	0.78 - 4.10	Surficial sediment	Silty Clay / Sand
BIBG-10-2-4	BIBG-10-2 / 10-2-4	0.50 - 3.77	Surficial sediment	Sand
BIBG-12-1-7	BIBG-12-1 / 12-1-7	3.80 - 7.50	Surficial sediment	Silty Sand / Sandy Silt
BIBG-12-2-4	BIBG-12-02 / 12-2-4	0.70 - 4.20	Surficial sediment	Silty Clay / Sandy Silt
FIBG-10-1-4	FIBG-10-1 / 10-1-4	0.69 - 3.97	Surficial sediment	Silty Clay / Sand
Goose Island Locations - Surficial Sediments				
GIBG-10-1-5	GIBG-10-1 / 10-1-5	1.20 - 4.50	Surficial sediment	Sandy Silt
GIBG-10-2-3	GIBG-10-2 / 10-2-3	1.30 - 3.00	Surficial sediment	Sand

Monitoring Well	Original Location Code (soil borehole / piezometer)	Depth Interval of Sandpack (m bgs)	Hydrogeologic Unit	Lithology Within Screened Interval
Background – Surficial Sediments and Bedrock - Associated with Natural Seepage Zones				
Background – Shallow Bedrock - Inferred to Represent Natural Hydrocarbon and Saline Water Seepage				
NWR 98-18-15	NWR 98-18-15	11.00 - 14.70	Shallow bedrock	Siltstone
NWR 99-16-17	NWR 99-16-17	12.60 - 17.00	Shallow bedrock	Siltstone
RB 02-3-2	RB 02-3-2	0.60 - 3.30	Shallow bedrock	Siltstone / Shale
NWR-09-1-20	NWR-09-1-20	16.50 - 20.00	Shallow bedrock	Shale / Siltstone / Sandstone
NWR-09-3-20	NWR-09-3-20	16.10 - 20.20	Shallow bedrock	Sandstone
NWR-09-4-17	NWR-09-4-17	15.24 - 17.30	Shallow bedrock	Siltstone
BT3-99-21-12	BT3-99-21-12	8.50 - 12.20	Shallow bedrock	Siltstone
Background – Surficial Sediments - Inferred to Represent Natural Hydrocarbon and Saline Water Seepage				
NWR 03-38-3	NWR 03-38-3	0.50 - 3.00	Surficial sediment	Sand and clay
RB-13-2-2.4	RB-13-2 / RB-13-2-2.4	0.60 - 2.55	Surficial sediment	Gravelly Sand and Clay
RB-13-4-3	RB-13-4 / RB-13-4-3	1.20 - 3.30	Surficial sediment	Sandy Gravel
RB-13-5-2.4	RB-13-5 / RB-13-5-2.4	0.60 - 2.55	Surficial sediment	Sandy Clay and Siltstone
RB-13-8-1.5	RB-13-8 / RB-13-8-1.5	0.16 - 1.50	Surficial sediment	Sandy Clay
Background – Surficial Sediments - Inferred to Represent Natural Gas Seepage Without Saline Water				
MEBG-15-4-3	MEBG-15-4	1.50 - 3.60	Surficial sediment	Silty Clay
MLS-14-2-3	MLS14-2 / MLS-14-2-3	1.00 - 2.50	Surficial sediment	Silty Clay and Siltstone
B38 02-33-3	B38X-02-2 / B38X 02-33-3	1.10 - 3.10	Surficial sediment	Sandy Silt
B38 02-34-3	B38X-02-3 / B38X 02-34-3	1.50 - 3.50	Surficial sediment	Clayey Silt

Advisian

WorleyParsons Group

Table 3
Soil and Bedrock Background Geochemical Statistical Summary (1998-2016)

Background Geochemical Statistics for Soil and Bedrock: Salinity Parameters

Imperial Oil - Norman Wells

	pH (pH units)	EC (dS/m)	SAR (ratio)
CCME Residential/Parkland Fine Surface (Islands)	6 - 8	2	5
CCME Industrial Fine Surface (Mainland)	6 - 8	4	12
95th Percentile Background - Organic Surface Soil (Mainland)	7.52	1.13	1.38
Maximum Background - Organic Surface Soil (Mainland)	7.57	1.5	1.5
95th Percentile Background - Organic Surface Soil (Islands)	7.83	2.9	0.7
Maximum Background - Organic Surface Soil (Islands)	7.9	3.3	0.75
95th Percentile Background - Mineral Surface Soil (Mainland)	7.49	0.71	1.65
Maximum Background - Mineral Surface Soil (Mainland)	7.61	0.73	2
95th Percentile Background - Mineral Surface Soil (Islands)	7.76	2.9	1.04
Maximum Background - Mineral Surface Soil (Islands)	7.77	2.9	1.4
95th Percentile Background - Mineral Subsurface Soil (Mainland)	8.04	1.91	5.68
Maximum Background - Mineral Subsurface Soil (Mainland)	8.1	2.4	22
95th Percentile Background - Mineral Subsurface Soil (Islands)	7.76	2.5	0.64
Maximum Background - Mineral Subsurface Soil (Islands)	7.81	2.9	1.1
95th Percentile Background - Bedrock (Mainland Siltstone)	7.67	1.52	22.85
Maximum Background - Bedrock (Mainland Siltstone)	7.72	1.26	26
95th Percentile Background - Bedrock (Mainland Shale)	NC	NC	NC
Maximum Background - Bedrock (Mainland Shale)	NC	NC	NC

NA Denotes guideline not available

NC Denotes parameters not measured / not calculated

Shading indicates parameters above most restrictive guidelines selected

Background Geochemical Statistics for Soil and Bedrock: Metals and Trace Elements

Imperial Oil - Norman Wells

	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (Hot Water Soluble) (mg/kg)	Cadmium (mg/kg)	Chromium (6+) (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Thallium (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Fine Surface (Islands)	20	12	500	4	---	10	0.4	64	50	63	140	6.6	10	50	1	1	23	130	200
CCME Industrial Fine Surface (Mainland)	40	12	2000	8	---	22	1.4	87	300	91	600	50	40	50	2.9	1	300	130	360
95th Percentile Background - Organic Surface Soil (Mainland)	2	9.05	471	0.83	2.64	1.01	0.15	51	10.7	22.7	12	0.13	17.2	33.8	1.62	1.26	4.2	45.7	90.2
Maximum Background - Organic Surface Soil (Mainland)	2	11	515	0.9	3	1.03	0.15	86.4	12	26	14	0.14	44	39	2.7	2.5	4.5	47	100
95th Percentile Background - Organic Surface Soil (Islands)	1	9.7	356	0.8	0.45	0.94	0.14	16.4	8.9	20.6	10.6	0.1	2.1	28.2	1	0.36	0.8	26.2	116
Maximum Background - Organic Surface Soil (Islands)	1	10	380	0.8	0.45	1	0.15	17	9	21	11	0.1	2.2	29	1	0.4	0.9	27	120
95th Percentile Background - Mineral Surface Soil (Mainland)	1	12.6	397	0.84	1.13	0.89	0.15	29.8	14	26	13.2	0.08	2.6	41.6	0.89	0.3	1.5	46.1	142
Maximum Background - Mineral Surface Soil (Mainland)	1	19	402	0.87	1.2	1.09	0.15	37	18	35	14	0.09	2.8	56	0.9	0.3	1.9	50	150
95th Percentile Background - Mineral Surface Soil (Islands)	1	8.8	353	0.62	0.31	0.9	0.15	21.5	9.54	21.8	12.6	0.07	3.2	29.6	0.88	0.3	1	29.4	108.5
Maximum Background - Mineral Surface Soil (Islands)	1	9.4	360	0.63	0.31	1.32	0.15	30	9.8	23	13.9	0.08	4.1	32	1.01	0.3	1.2	29.5	140
95th Percentile Background - Mineral Subsurface Soil (Mainland)	1	25.2	398	1.06	1.86	0.89	0.18	35	18.9	37.8	18.4	0.11	5.58	60.4	1.28	0.7	2	48.6	148
Maximum Background - Mineral Subsurface Soil (Mainland)	2	49	660	1.4	3.7	2	0.3	39	24.7	45	25.6	0.33	11	127	2.7	1	2.3	66	350
95th Percentile Background - Mineral Subsurface Soil (Islands)	1	9.25	368	0.6	0.52	0.7	0.15	18	9.4	22.9	11	0.06	2.4	29.9	0.8	0.3	1	30	99.9
Maximum Background - Mineral Subsurface Soil (Islands)	2	9.9	408	0.8	0.58	0.9	0.15	20	10	25	12	0.1	14	31	1	1	2	36	120
95th Percentile Background - Bedrock (Mainland Siltstone)	1	23.8	454	0.93	3	0.12	0.15	41.8	21.8	50	14.8	0.11	0.74	63.2	0.5	0.3	1	62.2	148
Maximum Background - Bedrock (Mainland Siltstone)	1	24	500	0.95	3.1	0.12	0.15	42	22	53	15	0.12	0.81	64	0.5	0.3	1	64	150
95th Percentile Background - Bedrock (Mainland Shale)	NC	39.6	NC	0.65	NC	0.74	NC	51.2	6.97	42.5	10.8	0.284	64.7	49.2	7.56	2.29	NC	125.7	106.2
Maximum Background - Bedrock (Mainland Shale)	NC	42.9	NC	0.66	NC	0.82	NC	53.6	7.16	43.6	11	0.312	66.4	49.6	7.9	2.33	NC	129	108

Advisian
WorleyParsons Group

Table 3
Soil and Bedrock Background Geochemical Statistical Summary (1998-2016)

Background Geochemical Statistics for Soil and Bedrock: Petroleum Hydrocarbon Parameters

Imperial Oil - Norman Wells

	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC-F1 (-BTEX) (mg/kg)	PHC-F2 (mg/kg)	PHC-F3 (mg/kg)	PHC-F4 (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo[b&j]fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo[a,h]anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno[1,2,3-cd]pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface (Islands)	2.1	110	120	65	210	150	1300	5600	0.28	320	2.5	1	0.6	1	6.2	1	15.4	0.25	1	0.013	0.046	7.7
CCME Industrial Fine Surface (Mainland)	2.8	330	430	230	320	260	2500	6600	0.28	320	32	10	72	10	NA	10	180	0.25	10	0.013	0.046	100
95th Percentile Background - Organic Surface Soil (Mainland)	0.018	0.073	0.036	0.144	43.3	111.5	831.5	195.5	0.016	0.016	0.012	0.02	0.02	0.02	0.15	0.0158	0.0196	0.026	0.0196	0.0226	0.3224	0.0476
Maximum Background - Organic Surface Soil (Mainland)	0.019	0.076	0.038	0.15	45	150	1200	200	0.019	0.019	0.015	0.02	0.02	0.02	0.23	0.019	0.02	0.03	0.02	0.025	0.52	0.066
95th Percentile Background - Organic Surface Soil (Islands)	0.0234	0.0704	0.0436	0.288	25.2	41.2	422	157	0.005	0.005	0.004	0.005	0.005	0.0145	0.008	0.005	0.0078	0.0069	0.005	0.0301	0.035	0.0135
Maximum Background - Organic Surface Soil (Islands)	0.028	0.083	0.052	0.35	27	44	440	160	0.005	0.005	0.004	0.005	0.005	0.015	0.008	0.005	0.0083	0.0072	0.005	0.033	0.037	0.014
95th Percentile Background - Mineral Surface Soil (Mainland)	0.011	0.044	0.022	0.088	14.1	33.8	277	118	0.005	0.005	0.004	0.01	0.01	0.014	0.01	0.005	0.01	0.018	0.01	0.0117	0.0289	0.0134
Maximum Background - Mineral Surface Soil (Mainland)	0.012	0.046	0.023	0.092	15	38	310	120	0.005	0.005	0.004	0.01	0.01	0.015	0.01	0.005	0.01	0.019	0.01	0.012	0.031	0.014
95th Percentile Background - Mineral Surface Soil (Islands)	0.0182	0.0656	0.047	0.34	29.2	43.8	274	90	0.005	0.005	0.004	0.008	0.008	0.0255	0.0176	0.007	0.012	0.01	0.011	0.0395	0.0379	0.0192
Maximum Background - Mineral Surface Soil (Islands)	0.038	0.095	0.089	0.72	52	72	370	96	0.005	0.005	0.004	0.009	0.009	0.029	0.019	0.008	0.014	0.011	0.012	0.05	0.04	0.021
95th Percentile Background - Mineral Subsurface Soil (Mainland)	0.015	0.02	0.016	0.081	18.3	83.7	536.5	209.5	0.006	0.006	0.004	0.006	0.009	0.022	0.025	0.006	0.011	0.013	0.01	0.018	0.045	0.02
Maximum Background - Mineral Subsurface Soil (Mainland)	0.02	0.18	0.059	0.34	42	180	1800	830	0.01	0.01	0.004	0.01	0.01	0.027	0.026	0.01	0.012	0.03	0.01	0.022	0.063	0.022
95th Percentile Background - Mineral Subsurface Soil (Islands)	0.005	0.02	0.01	0.04	15.5	27	207	86	0.005	0.005	0.004	0.005	0.005	0.019	0.034	0.005	0.008	0.005	0.0064	0.025	0.059	0.0164
Maximum Background - Mineral Subsurface Soil (Islands)	0.02	0.048	0.021	0.04	30	79	380	96	0.005	0.005	0.004	0.005	0.005	0.02	0.059	0.005	0.008	0.005	0.009	0.028	0.11	0.019
95th Percentile Background - Bedrock (Mainland)	0.0775	0.4	0.96	6.08	96.8	825.5	1265	288	0.034	0.023	0.004	0.023	0.0065	0.027	0.122	0.007	0.014	0.236	0.005	0.048	0.771	0.08
Maximum Background - Bedrock (Mainland)	0.15	0.78	1.9	12.1	140	920	1400	410	0.037	0.025	0.004	0.025	0.0067	0.027	0.13	0.007	0.014	0.26	0.005	0.05	0.83	0.086

Table 4
Natural Seeps Soil and Bedrock Background Geochemical Statistical Summary (1998-2016)

Background Geochemical Statistics for Natural Seeps Soil and Bedrock: Salinity Parameters

Imperial Oil - Norman Wells

	pH (pH units)	EC (dS/m)	SAR (ratio)
CCME Industrial Fine Surface	6 - 8	4	12
95th Percentile Background - Organic Surface Soil (Mainland)	7.45	1.32	1.27
Maximum Background - Organic Surface Soil (Mainland)	7.49	1.4	1.4
95th Percentile Background - Mineral Surface Soil (Mainland)	7.72	0.79	0.64
Maximum Background - Mineral Surface Soil (Mainland)	7.72	0.8	0.7
95th Percentile Background - Mineral Subsurface Soil (Mainland)	7.78	0.98	7.28
Maximum Background - Mineral Subsurface Soil (Mainland)	7.8	1.1	11
95th Percentile Background - Bedrock (Mainland Siltstone)	7.75	0.9	2.84
Maximum Background - Bedrock (Mainland Siltstone)	7.78	0.97	2.9

NA Denotes guideline not available
NC Denotes parameters not measured / not calculated
Shading indicates parameters above most restrictive guidelines selected

Background Geochemical Statistics for Natural Seeps Soil and Bedrock: Metals and Trace Elements

Imperial Oil - Norman Wells

	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (Hot Water Soluble) (mg/kg)	Cadmium (mg/kg)	Chromium (6+) (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Thallium (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface	40	12	2000	8	---	22	1.4	87	300	91	600	50	40	50	2.9	1	300	130	360
95th Percentile Background - Organic Surface Soil (Mainland)	1	10.4	476.5	0.8	3.1	1.35	0.14	29.5	14.4	23.7	20.7	0.11	12.5	45.1	1.08	0.55	2.83	43	127
Maximum Background - Organic Surface Soil (Mainland)	1	11	520	0.8	3.5	1.5	0.15	33	16	24	21	0.11	14	49	1.1	0.6	3	46	130
95th Percentile Background - Mineral Surface Soil (Mainland)	1	11.6	419.5	0.83	0.68	0.9	0.15	23.55	10.3	18.6	13.6	0.08	2.23	29.6	0.91	0.3	1.6	41.8	113
Maximum Background - Mineral Surface Soil (Mainland)	1	13	430	0.85	0.7	1.1	0.15	26	11	19	14	0.1	2.3	31	1	0.3	1.6	46	120
95th Percentile Background - Mineral Subsurface Soil (Mainland)	1	20.2	360	0.87	1.65	0.96	0.15	33.6	17.4	41.8	15.4	0.05	2.84	52.2	0.98	0.3	1.28	46.8	154
Maximum Background - Mineral Subsurface Soil (Mainland)	1	25	380	0.99	2.3	1.2	0.15	42	21	49	17	0.05	3	63	1.1	0.3	1.4	54	170
95th Percentile Background - Bedrock (Mainland Siltstone)	1	21	194	0.61	1.2	0.1	0.15	36.4	18.7	30.1	11	0.076	0.4	55.1	0.5	0.3	1	86.8	135.5
Maximum Background - Bedrock (Mainland Siltstone)	1	21	200	0.65	1.2	0.1	0.15	37	19	31	11	0.08	0.4	56	0.5	0.3	1	94	140

Advisian
WorleyParsons Group

Table 4
Natural Seeps Soil and Bedrock Background Geochemical Statistical Summary (1998-2016)

Background Geochemical Statistics for Natural Seeps Soil and Bedrock: Petroleum Hydrocarbon Parameters

Imperial Oil - Norman Wells

	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC-F1 (-BTEX) (mg/kg)	PHC-F2 (mg/kg)	PHC-F3 (mg/kg)	PHC-F4 (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo[b&j]fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo[a,h]anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno[1,2,3-cd]pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface	2.8	330	430	230	320	260	2500	6600	0.28	320	32	10	72	10	NA	10	180	0.25	10	0.013	0.046	100
95th Percentile Background - Organic Surface Soil (Mainland)	0.011	0.044	0.022	0.09	18	150.7	4645	3019	0.01	0.01	0.008	0.01	0.0117	0.029	0.121	0.0117	0.011	0.0117	0.011	0.015	0.254	0.019
Maximum Background - Organic Surface Soil (Mainland)	0.011	0.044	0.022	0.09	19	160	5200	3400	0.01	0.01	0.008	0.01	0.012	0.032	0.14	0.012	0.011	0.012	0.011	0.016	0.29	0.019
95th Percentile Background - Mineral Surface Soil (Mainland)	0.009	0.037	0.184	0.074	12.6	215.5	4750	3135	0.0165	0.011	0.009	0.013	0.026	0.016	0.107	0.009	0.019	0.017	0.012	0.034	0.045	0.043
Maximum Background - Mineral Surface Soil (Mainland)	0.012	0.046	0.023	0.092	13	240	5100	3800	0.02	0.012	0.01	0.014	0.032	0.017	0.15	0.01	0.024	0.021	0.013	0.047	0.052	0.059
95th Percentile Background - Mineral Subsurface Soil (Mainland)	2.655	0.078	2.96	18.55	973	2706.5	4438.5	1691.5	0.149	0.02	0.004	0.076	0.005	0.065	0.633	0.006	0.034	0.646	0.005	1.386	2.366	0.286
Maximum Background - Mineral Subsurface Soil (Mainland)	2.9	0.097	4.3	21	1400	3900	6500	2500	0.21	0.026	0.004	0.11	0.005	0.091	0.95	0.006	0.048	0.93	0.005	2.1	3.5	0.43
95th Percentile Background - Bedrock (Mainland)	0.034	0.02	0.018	0.06	139.5	1185	2780	1035.5	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Maximum Background - Bedrock (Mainland)	0.039	0.02	0.02	0.063	150	1200	2900	1100	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Advisian
WorleyParsons Group

Table 5
Groundwater Indicator Parameters - Background Geochemical Statistical Summary (1997-2017)

PROJECT No.: 407011-00622

Monitoring Station	Bicarbonate (mg/L)	Calcium (mg/L)	Carbonate (CO3) (mg/L)	Chloride (mg/L)	Electrical Conductivity (uS/cm)	Hardness (as CaCO3) (mg/L)	Hydroxide (mg/L)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	pH (pH units)	Phenols (mg/L)	Potassium (mg/L)	PP Alkalinity (as CaCO3) (mg/L)	Sodium (mg/L)	Sulphate (mg/L)	Total Dissolved Solids (mg/L)
CCME 2015. CEQG Freshwater Aquatic Life	---	---	---	120	---	---	---	3	0.06	(6.5 - 9)	0.004	---	---	---	---	---
Background - Surficial Sediments																
Mainland Locations - Surficial Sediments - 95th Percentile Background	1000	322	0.5	18	2355	1253	0.5	5.4	0.03	8.1	0.013	5.4	1.0	160	727.5	1640
Mainland Locations - Surficial Sediments - Maximum Background	1100	400	0.5	26	2800	1600	0.5	36	0.11	8.1	0.021	12.0	1.0	180	980	2200
Bear, Goose, and Frenchy's Islands - Surficial Sediments - 95th Percentile Background	987	480	0.5	18	2600	1600	0.5	2.5	0.04	8.0	0.014	4.5	0.5	125	970	2295
Bear, Goose, and Frenchy's Islands - Surficial Sediments - Maximum Background	1200	540	0.5	25	3000	1800	0.5	23	0.17	8.1	0.048	5.3	0.5	520	1200	2700
Background - Shallow Bedrock - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage																
Shallow Bedrock - Natural Saline Water & Oil Seepage - 95th Percentile Background	1570	147	26	314	2954	350	0.5	1.8	0.06	8.5	0.019	6.4	21.5	747	98	1956
Shallow Bedrock - Natural Saline water & Oil Seepage - Maximum Background	1680	170	40	346	3100	390	1.0	4.0	0.26	8.6	0.025	6.8	33.0	771	185	2600
Background - Surficial Sediments - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage																
Surficial Sediments - Natural Saline Water & Oil Seepage - 95th Percentile Background	1220	350	62	280	2780	1200	1.0	0.2	0.06	8.7	0.020	7.5	51.0	440	990	2015
Surficial Sediments - Natural Saline Water & Oil Seepage - Maximum Background	1300	390	200	291	2800	1300	1.0	0.4	0.06	10.1	0.023	8.6	160.0	680	1000	2300
Background - Surficial Sediments - Inferred to Represent Natural Gas Seepage without Saline Water																
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - 95th Percentile Background	879	270	1.0	11	1392	741	1.0	0.2	0.06	7.7	0.063	7.0	1.0	49	204	948
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - Maximum Background	950	330	1.0	13	1600	750	1.0	0.2	0.06	7.9	0.072	10.0	1.0	72	330	1200

NA Denotes guideline not available
NC Denotes parameters not measured / not calculated
Shading indicates parameters above most restrictive guidelines selected

Advisian
WorleyParsons Group

Table 6
Groundwater Dissolved Metals - Background Geochemical Statistical Summary (1997-2017)

PROJECT No.: 407011-00622

Monitoring Station	Aluminum (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME 2015. CEQG Freshwater Aquatic Life	**0.1**	**0.005**	**---**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**---**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
Background - Surficial Sediments																		
Mainland Locations - Surficial Sediments - 95th Percentile Background	0.05	0.006	0.55	0.29	0.0020	0.007	0.012	5	0.020	3	0.00037	0.005	0.03	0.003	0.0100	0.020	0.040	0.030
Mainland Locations - Surficial Sediments - Maximum Background	0.08	0.070	0.88	0.34	0.0020	0.010	0.020	10	0.100	4	0.00094	0.005	0.04	0.030	0.0100	0.030	1.0	0.042
Bear, Goose, and Frenchy's Islands - Surficial Sediments - 95th Percentile Background	0.03	0.002	0.22	0.04	0.00047	0.001	0.010	12	0.001	6	0.00000	0.025	0.02	0.001	0.0001	0.0002	0.029	0.030
Bear, Goose, and Frenchy's Islands - Surficial Sediments - Maximum Background	0.04	0.004	0.23	0.09	0.00073	0.010	0.014	64	0.002	10	0.00000	0.041	0.04	0.002	0.0010	0.002	0.082	0.034
Background - Shallow Bedrock - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage																		
Shallow Bedrock - Natural Saline Water & Oil Seepage - 95th Percentile Background	0.12	0.050	7.51	1.34	0.0020	0.007	0.012	2	0.030	0.3	0.00025	0.009	0.02	0.004	0.0002	0.030	0.076	0.018
Shallow Bedrock - Natural Saline water & Oil Seepage - Maximum Background	5.35	0.066	9.30	1.37	0.0020	0.007	0.019	12	0.100	0.8	0.00058	0.031	0.04	0.030	0.0100	0.030	1.0	0.212
Background - Surficial Sediments - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage																		
Surficial Sediments - Natural Saline Water & Oil Seepage - 95th Percentile Background	0.07	0.031	1.39	1.13	0.0014	0.007	0.012	25	0.042	3	0.00005	0.020	0.02	0.001	0.0001	0.0012	0.411	1.40
Surficial Sediments - Natural Saline Water & Oil Seepage - Maximum Background	0.12	0.035	2.01	1.40	0.0020	0.007	0.014	28	0.100	3	0.00005	0.020	0.02	0.002	0.0002	0.0016	1.0	1.70
Background - Surficial Sediments - Inferred to Represent Natural Gas Seepage without Saline Water																		
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - 95th Percentile Background	0.03	0.016	1.32	0.09	0.0013	0.007	0.008	14	0.051	5	0.00005	0.006	0.02	0.002	0.0001	0.0008	0.506	0.022
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - Maximum Background	0.14	0.021	1.41	0.12	0.0020	0.007	0.009	19	0.100	6	0.00005	0.006	0.03	0.003	0.0002	0.0008	1.0	0.037

NA Denotes guideline not available
NC Denotes parameters not measured / not calculated
Shading indicates parameters above most restrictive guidelines selected

Advisian
WorleyParsons Group

Table 7
Groundwater PHCs - Background Geochemical Statistical Summary (1997-2017)

PROJECT No.: 407011-00622

Monitoring Station	Benzene (mg/L)	Ethylbenzene (mg/L)	PHC F1 (C6-C10) - BTEX (mg/L)	PHC F2 (C10-C16) (mg/L)	Toluene (mg/L)	Xylenes-Total (mg/L)
CCME 2015. CEQG Freshwater Aquatic Life	**0.37**	**0.09**	**---**	**---**	**0.002**	**---**
Background - Surficial Sediments						
Mainland Locations - Surficial Sediments - 95th Percentile Background	0.0005	0.0005	0.1	0.1	0.0005	0.0010
Mainland Locations - Surficial Sediments - Maximum Background	0.01	0.01	0.19	0.20	0.01	0.01
Bear, Goose, and Frenchy's Islands - Surficial Sediments - 95th Percentile Background	0.0004	0.0004	0.1	0.1	0.0004	0.0008
Bear, Goose, and Frenchy's Islands - Surficial Sediments - Maximum Background	0.0004	0.0004	0.1	0.1	0.0004	0.0008
Background - Shallow Bedrock - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage						
Shallow Bedrock - Natural Saline Water & Oil Seepage - 95th Percentile Background	0.06	0.002	0.89	35	0.003	0.010
Shallow Bedrock - Natural Saline water & Oil Seepage - Maximum Background	0.17	0.05	3.90	130	0.050	0.10
Background - Surficial Sediments - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage						
Surficial Sediments - Natural Saline Water & Oil Seepage - 95th Percentile Background	0.09	0.002	0.24	1.6	0.0009	0.014
Surficial Sediments - Natural Saline Water & Oil Seepage - Maximum Background	0.10	0.003	0.60	3.0	0.0014	0.08
Background - Surficial Sediments - Inferred to Represent Natural Gas Seepage without Saline Water						
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - 95th Percentile Background	0.97	0.007	0.28	2.1	0.016	0.22
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - Maximum Background	1.25	0.025	0.82	2.8	0.025	0.37

NA Denotes guideline not available
NC Denotes parameters not measured / not calculated
Shading indicates parameters above most restrictive guidelines selected

Advisian
WorleyParsons Group

Table 8

Groundwater PAHs - Background Geochemical Statistical Summary (1997-2017)

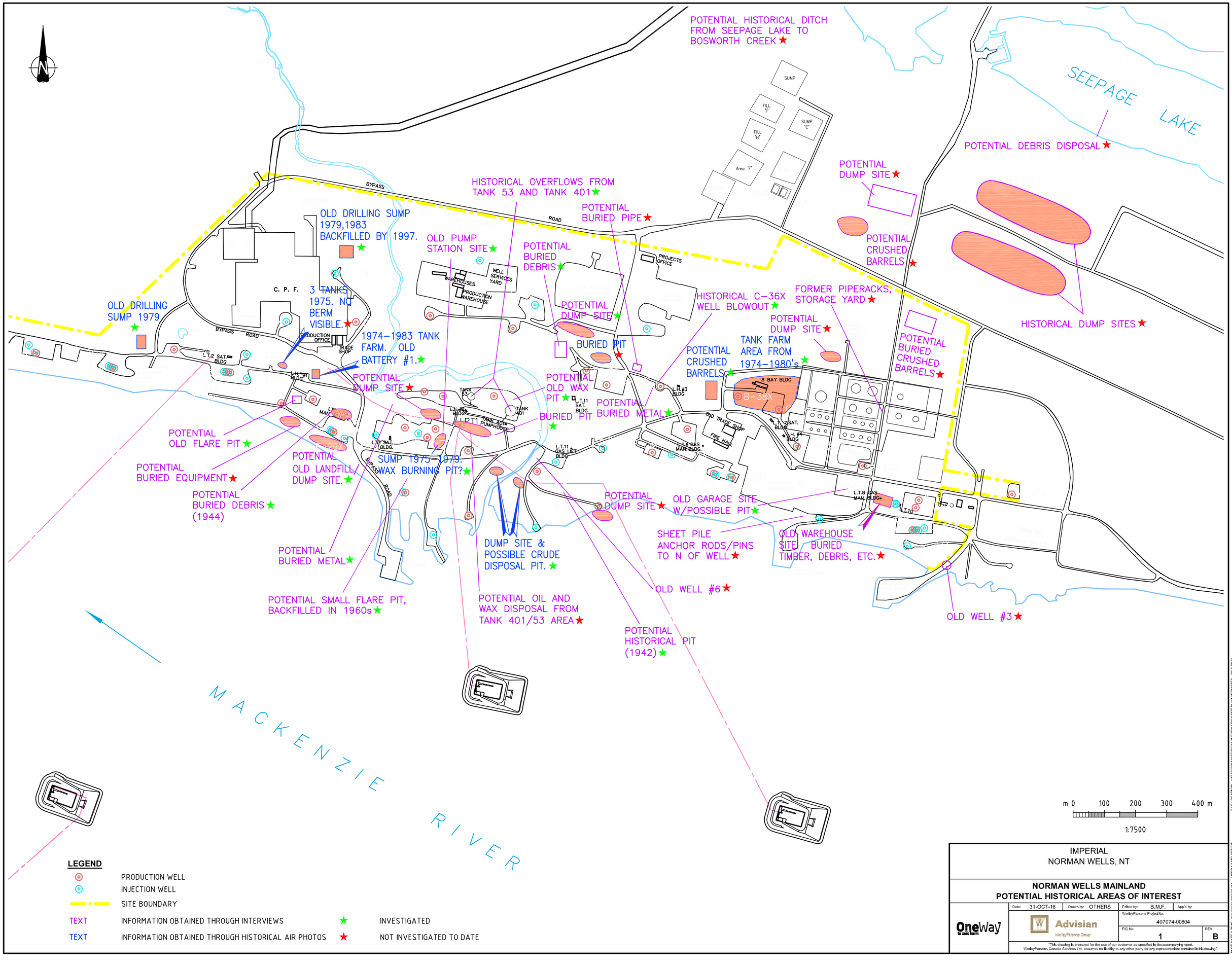
PROJECT No.: 407011-00622

Monitoring Station	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo[a]anthracene (mg/L)	Benzo[a]pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME 2015. CEQG Freshwater Aquatic Life	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
Background - Surficial Sediments											
Mainland Locations - Surficial Sediments - 95th Percentile Background	0.00010	0.00005	0.000010	0.000009	0.0000075	0.00004	0.00005	0.0001	0.00008	0.000036	0.0002
Mainland Locations - Surficial Sediments - Maximum Background	0.00010	0.00005	0.000032	0.000068	0.0000075	0.00039	0.00005	0.0001	0.00036	0.00028	0.0002
Bear, Goose, and Frenchy's Islands - Surficial Sediments - 95th Percentile Background	0.00010	0.00005	0.000010	0.000009	0.0000075	0.00001	0.00005	0.0001	0.00006	0.000020	0.0002
Bear, Goose, and Frenchy's Islands - Surficial Sediments - Maximum Background	0.00010	0.00005	0.000010	0.000009	0.0000075	0.00001	0.00005	0.0001	0.00007	0.000020	0.0002
Background - Shallow Bedrock - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage											
Shallow Bedrock - Natural Saline Water & Oil Seepage - 95th Percentile Background	0.00053	0.00005	0.000012	0.000088	0.0000346	0.00007	0.0016	0.0054	0.00369	0.00026	0.0002
Shallow Bedrock - Natural Saline water & Oil Seepage - Maximum Background	0.00096	0.00005	0.000034	0.000110	0.0000770	0.00009	0.0022	0.0066	0.00470	0.00049	0.0002
Background - Surficial Sediments - Inferred to Represent Natural Saline Water & Hydrocarbon Seepage											
Surficial Sediments - Natural Saline Water & Oil Seepage - 95th Percentile Background	0.00042	NC	0.000024	0.000009	0.0000075	0.00006	0.0018	0.0031	0.00172	0.00020	NC
Surficial Sediments - Natural Saline Water & Oil Seepage - Maximum Background	0.00062	NC	0.000076	0.000016	0.0000075	0.00006	0.0020	0.0038	0.00370	0.00021	NC
Background - Surficial Sediments - Inferred to Represent Natural Gas Seepage without Saline Water											
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - 95th Percentile Background	0.00016	0.00005	0.000049	0.000038	0.0000127	0.00030	0.0002	0.0035	0.00042	0.00022	0.0002
Surficial Sediments - Natural Gas & Non-Saline Water Seepage - Maximum Background	0.00016	0.00005	0.000051	0.000040	0.0000130	0.00032	0.0002	0.0037	0.00044	0.00023	0.0002

NA Denotes guideline not available
NC Denotes parameters not measured / not calculated
Shading indicates parameters above most restrictive guidelines selected

Appendix 4 Areas of Potential Environmental Concern (APECs)





POTENTIAL HISTORICAL DITCH FROM SEEPAGE LAKE TO BOSWORTH CREEK
SEEPAGE LAKE
POTENTIAL DEBRIS DISPOSAL
POTENTIAL DUMP SITE
POTENTIAL CRUSHED BARRELS
HISTORICAL DUMP SITES
HISTORICAL OVERFLOWS FROM TANK 53 AND TANK 401
POTENTIAL BURIED PIPE
OLD DRILLING SUMP 1979,1983 BACKFILLED BY 1997.
OLD PUMP STATION SITE
POTENTIAL BURIED DEBRIS
OLD DRILLING SUMP 1979
3 TANKS 1975. NO BERM VISIBLE.
1974–1983 TANK FARM. OLD BATTERY #1.
POTENTIAL DUMP SITE
BURIED PIT
HISTORICAL C–36X WELL BLOWOUT
FORMER PIPERACKS, STORAGE YARD
POTENTIAL DUMP SITE
TANK FARM AREA FROM 1974–1980's
POTENTIAL CRUSHED BARRELS
POTENTIAL BURIED CRUSHED BARRELS
POTENTIAL DUMP SITE
POTENTIAL OLD WAX PIT
BURIED PIT
POTENTIAL BURIED METAL
POTENTIAL OLD FLARE PIT
POTENTIAL BURIED EQUIPMENT
POTENTIAL OLD LANDFILL/ DUMP SITE.
SUMP 1975–1979. WAX BURNING PIT?
POTENTIAL BURIED DEBRIS (1944)
POTENTIAL DUMP SITE
OLD GARAGE SITE W/POSSIBLE PIT
SHEET PILE ANCHOR RODS/PINS TO N OF WELL
OLD WAREHOUSE SITE. BURIED TIMBER, DEBRIS, ETC.
POTENTIAL BURIED METAL
DUMP SITE & POSSIBLE CRUDE DISPOSAL PIT.
OLD WELL #6
OLD WELL #3
POTENTIAL SMALL FLARE PIT, BACKFILLED IN 1960s
POTENTIAL OIL AND WAX DISPOSAL FROM TANK 401/53 AREA
POTENTIAL HISTORICAL PIT (1942)
MACKENZIE RIVER
BYPASS ROAD
C. P. F.
PRODUCTION OFFICE
TRADE SHOP
WAREHOUSES
WELL SERVICES YARD
PRODUCTION WAREHOUSE
PROJECTS OFFICE
8 BAY BLDG
B–38X
OLD TRADE SHOP
FIRE HALL
TANK 53
TANK 401
PT1
TANK 401 PUMPHOUSE
L.T.2 SAT. BLDG
L.T.11 SAT. BLDG
L.T.11 GAS LIFT BLDG
L.T.6 GAS MAN. BLDG
L.T.8 GAS MAN. BLDG
L.T.10
L.T.7 SAT. BLDG
L.H. #4 BLDG
L.H. #3 BLDG
L.H. #1 BLDG
L.T.7 SAT. BLDG
L.T.8 SAT. BLDG
L.T.10 SAT. BLDG
L.T.11 SAT. BLDG
L.T.2 SAT. BLDG
SUMP
FILL 'I'
FILL 'H'
SUMP 'C'
Area 'F'
m 0 100 200 300 400 m
1:7500
LEGEND
PRODUCTION WELL
INJECTION WELL
SITE BOUNDARY
TEXT INFORMATION OBTAINED THROUGH INTERVIEWS
TEXT INFORMATION OBTAINED THROUGH HISTORICAL AIR PHOTOS
INVESTIGATED
NOT INVESTIGATED TO DATE
IMPERIAL
NORMAN WELLS, NT
NORMAN WELLS MAINLAND
POTENTIAL HISTORICAL AREAS OF INTEREST
Date: 31-OCT-16
Drawn by: OTHERS
Edited by: B.M.F.
App'd by:
WorleyParsons Project No. 407074-00804
FIG No 1
REV B
OneWay to zero harm
Advisian WorleyParsons Group
"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

Advisian
WorleyParsons Group

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland West								
	MW-1	Cemetery Sump	Buried drilling waste	NW of Town Cemetery	Hydrocarbons and salts in soil	Interviews/Phase II ESA/Aerial Photographs	Phase I & II ESAs, geophysical surveys, capping program, on-going monitoring	Proven, delineated, risk assessment complete
	MW-2	Former Battery #1/LH #1	Leaks and spills from former infrastructure, tanks	East of LH #1	Hydrocarbons, metals, salts. May be material buried on east side of the former battery. Inert debris.	Interviews/Aerial Photographs	Phase I & II ESAs	Proven, surface hydrocarbons in soil
	MW-3	F-28X Wellsite/Former Flare Pits (2), Former Pit (1)	Wellhead casing vent flow, flare pit, possible flowline leak in northern area	F-28X wellsite	Hydrocarbons and metals in soil; chloride in groundwater	Interviews/Aerial Photographs/Phase II ESA	Phase I & II ESAs, geophysical surveys, on-going monitoring	Proven, partially delineated
	MW-4	Former Location of Multiple tanks and pits	Possible historical leaks/spills from tanks, buried waste in pits	E of LT #3	Buried debris, metals, hydrocarbons	Aerial photographs	Phase I & II ESAs	Partially investigated, minor F2 issue identified
	MW-5	Old landfill/dump site	Buried debris, leaks from buried tanks/equipment	South of E-29X/G-30X wellsites	Hydrocarbons, metals, inert debris. There may be a small boiler buried here.	Interviews	Geophysical surveys, soil and groundwater sampling	Proven, partially delineated debris. Hydrocarbon soil impact may be partially natural seeps.
	MW-6	Historical Laydown/Camp Area	Possible leaks/spills from former infrastructure, equipment	West of CPF	Hydrocarbons, salts, metals	Aerial photographs	Phase I ESA	Potential. No characterization or delineation activities in the area to date.
	MW-7	CPF	Multiple sources from leaks, drips, spills, tanks, flowlines	Current CPF site	Hydrocarbons, salts and metals in soil. Hydrocarbons in groundwater - particularly near flare stack area	Phase II ESA	Phase II ESA	Proven, limited investigation. Further delineation will be required.
	MW-8	CPF Flare Stack	Flare stack carry-over, leaks from above ground flare line	NE of CPF	Hydrocarbons in soil and groundwater	Phase II ESA	Phase II ESA	Proven, limited investigation. Further delineation will be required.
	MW-9	C-27X Sump	Buried drilling waste	C-27X wellsite	Hydrocarbons, salts, metals and buried drill muds/fluids	Interviews/Phase II ESA/Aerial Photographs	Phase I & II ESAs, geophysical surveys, backfilled subsidence area, on-going monitoring	Proven, soil partially delineated. Groundwater impacts not fully delineated to the north
	MW-10	C-27X Line Break / Wellhead	Wellhead leaks, released fluids from line break	C-27X wellsite	Hydrocarbons, salts	On-site inspection, previous spills reported	Phase II ESA, wellhead abandonment	Proven, limited investigation. Further delineation will be required.
	MW-11	E-27X Well site	Wellhead leaks, potential spill of workover fluids	E-27X Well	Hydrocarbons and salts	Phase II ESA	Phase II ESA, wellhead abandonment	Proven, investigation, not delineated
	MW-12	Historical Excavation by Drill Rig Site	Potential drilling fluids/solids disposed in old pit	N of H-21X wellsite	Hydrocarbons, salts	Aerial photographs	Phase I ESA	Potential. Not investigated
	MW-13	Former AST and Pit West of Cemetery Sump	Potential leaks/spills from AST, buried fluids/solids in pit	W of Cemetery Sump	Hydrocarbons, salts	Aerial photographs	Phase I ESA, Preliminary Phase II ESA	Potential, limited investigation.
	MW-14	Historical Tank Farm	Potential leaks/spills from ASTs	NW of G-28X wellsite	Hydrocarbons, salts	Aerial photographs	Phase I ESA	Potential. Not investigated
	MW-15	Historical AST and Pit	Potential leaks/spills from AST, buried fluids/solids in pit	NW of G-30X wellsite	Hydrocarbons, salts	Aerial photographs	Phase I ESA	Potential. Not investigated
	MW-16	Historical Pit	Potential buried fluids/solids in pit	SE of G-30X wellsite	Hydrocarbons, salts	Aerial photographs	Phase I ESA	Potential. Not investigated

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland West (cont'd)	MW-17	Historical AST	Potential leaks/spills from AST	W of Backwash Pond	Hydrocarbons	Aerial photographs	Phase I ESA	Potential. Not investigated
	MW-18	Historical AST	Potential leaks/spills from AST	E of E-26X wellsite	Hydrocarbons, salts	Aerial photographs	Phase I ESA	Potential. Not investigated
	MW-19	Historical AST	Potential leaks/spills from AST	Near E-25X wellsite	Hydrocarbons, salts	Aerial photographs	Phase I ESA	Potential. Not investigated
	MW-20	Potential historical dump site	Potential buried equipment leaks	S of E-28X wellsite	Hydrocarbons, salts, metallic debris	Interviews	Phase I ESA	Potential. Not investigated
	Footnote 1	All Wellsites and Supporting Infrastructure	Spills & leaks from wellheads, workover fluids, tanks	Mainland West	Hydrocarbons and salts from operations	Phase I & II ESA	Phase I ESA; Phase II ESA and wellhead abandonment at select sites	Proven, initial investigation at E-27X and C-27X
Mainland Central								
	MC-1	Buried metal/scrubbers	Leaks from buried equipment	NW of J-29X	Buried metal debris	Interviews	Phase I & II ESAs	Partially investigated, no issues identified to date F31
	MC-2	E-32X/Former flare pit	Leaks/spills at wellhead, fluids/solids historically disposed in pit	Wellhead and NE of E-32X	Black staining apparently showed on ground surface periodically. The Flare Pit was reportedly backfilled in 1960s. Hydrocarbons in soil at wellhead and a natural seepage zone down gradient.	Interviews/Phase II ESA	Phase I & II ESAs, geophysical surveys	Proven, limited investigation. Further delineation will be required.
	MC-3	Historical Flowline Release	Residual PHCs in soil inaccessible under flowline bundle	NW of F-31X Well Site	Residual hydrocarbons remaining in soils from a flowline break under active flowlines	Spill report, Phase II ESA, Soil Remedial Excavation	Geophysics, Phase II ESA	Proven, remediation. Residual impacts.
	MC-4	Buried Pit/Old pump station site	Pit contents, leaks from pump station equipment	E-32-1X/S of E-32-1X; ENE of G-32X	Buried metal, hydrocarbons, salts	Interviews/Aerial photographs	Phase I & II ESAs, geophysical surveys	Proven, partially delineated. Soil, groundwater G32
	MC-5	Two historical pits	Pit contents	N of F-33X on bank	Buried metal, hydrocarbons	Aerial photographs	Phase I & II ESAs, geophysical surveys	Investigated. Hydrocarbons may be due to natural seeps.
	MC-6	Well Services Yard	Leaks and drips from stored tanks, equipment	NW of B-33X wellsite	Hydrocarbons, metals and salts in soil	Phase II ESA	Phase I and II ESAs, geophysical surveys	Potential. Further investigation required.
	MC-7	Historical Flowline Release	Released emulsion fluids	SE of C-32X wellsite, N bank of Bosworth Creek	Residual hydrocarbons and salts from flowline break	Initial spill response/cleanup by Operations, subsequent Phase II ESA	Geophysical surveys, Phase II ESA	Proven. Delineated.
	MC-8	Former Tank 53	Historical tank spills/leaks of PHCs	W of D-32X wellsite	Residual hydrocarbons in soil under access road and south berm	Interviews/Phase II ESA/Remediation reports	Tank removed, Phase I & II ESAs, soil remediation and reclamation partially complete	Proven, delineated, partially remediated. Hydrocarbons in soil.
	MC-9	Potential Historical Dump site, Potential Grave Site in area	Leaks, spills from buried equipment, buried oil	N of E-33X	Hydrocarbons. Buried oil from Tank 401/53 area. Potential Cultural / Heritage site concern	Interviews / operations excavation	Phase I ESA	Proven during Operations work, no investigation. Delineation required.
	MC-10	Potential old wax pit	Pit contents	N of Tank 401	Hydrocarbons. Historically waxy sludge from Tank 401 bottom shoveled out & disposed to this pit.	Interviews/Aerial photographs	Phase I & II ESAs	Investigated, pit presence not confirmed at this location, no issues identified D32
	MC-11	Former Tank 401	Historical tank spills/leaks of PHCs	SE of D-32X wellsite	Residual hydrocarbons in soil	Phase II ESA/Remedial Excavation	Tank removed, Phase I & II ESAs, soil remediation and reclamation partially complete	Proven, delineated, partially remediated. Residual hydrocarbons in soil under berm and flowline to south.
	MC-12	Potential buried pit	Pit contents	S of Tank 401 pumphouse	Buried metals, hydrocarbons	Interviews	Phase I & limited II ESAs	Limited investigation, potential PHC impact
	MC-13	Possible grave site	None	S of Tank 401 pumphouse	Anecdotal information suggests there may have been a grave site in this treed area.	Interviews	Phase I ESA	Potential

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland Central (cont'd)	MC-14	Possible site of old Well #6.	Wellhead leaks, workover fluids	NW of D-34X	Hydrocarbons. On Bosworth Creek bank south of lower bridge. Marked by valve sticking up above ground.	Interviews, Old Site Maps	Phase I & II ESAs	Site visit at wellsite. No further investigation at wellsite but area incorrectly identified as Well #6 was investigated. Proven, hydrocarbon impacts. Further delineation required. D34
	MC-15	Former pit (active fire noted in 1965 air photo)	Pit contents	SW of D-34X on bank. Likely pits on both sides of Bosworth Creek	Buried debris, hydrocarbons	Aerial photographs	Phase I & II ESAs	Proven, limited investigation. Further delineation will be required. BOSD
	MC-16	A&R and Operations Biocells / ARB Area	Unverified but suspected fuel spill	Field Services Storage Pad / Yard D	Hydrocarbons in soil and groundwater from historical site use	Phase I ESA, Phase II ESA	Phase I & II ESAs, RAP, remedial excavations completed	Proven, delineated, RAP developed, remedial excavations completed, area re-seeded
	MC-17	Land farm area and dump site	Dump contents - metallic debris, potential leaked fluids	N of former Battery #3 flare pit	Buried metal, hydrocarbons, possible airplane?	Interviews/Aerial photographs/Phase II ESA	Phase I & II ESAs, geophysical surveys	Proven, not delineated
	MC-18	Former Battery #3 Flare Pit	Fluids disposed to flare pit	N of LT #11	Hydrocarbons, salts in soil. Historical Battery #3 flare pit. Residual metals impact on surface previously removed and disposed off-site.	Phase II ESA	Phase II ESA, RAP, remedial excavation/soil treatment, supplementary Phase II ESA	Proven, delineated, RAP developed, remedial excavation completed and soil washing pilot test underway
	MC-19	East Bosworth Creek Bank	Historical releases from Battery #3 tankfarm area, leaking flowline down side slope, asbestos wrapped pipe	W of former Battery #3 Area	Residual asbestos and hydrocarbons in soil on creek bank, metal debris exposed at surface	Phase II ESA	Phase II ESAs, restoration activities	Proven, further delineation required, stabilized, monitoring
	MC-20	Bosworth Delta/Old hydrocarbon pit	Potential for PHC fluids disposed in pit	Between D-34X and D-36X-1	Proven hydrocarbons in localized areas on the delta. Pit used in 1942 for crude (?) disposal. Location not verified to date.	Interviews/Phase II ESA	Phase I & II ESAs, geophysical surveys	Investigated. PHCs, metals, salts impact in shallow soil.
	MC-21	LT #11 Area	Leaks and spills from operational activities	N of G-35X	Hydrocarbons and salts in soil; hydrocarbons and chloride in groundwater	Phase II ESA	Preliminary Phase II ESA	Proven
	MC-22	Former Battery #3 Process Area	Numerous - process buildings, treater, tank farm, meter building, etc.	G-35X well site	Hydrocarbons and salts in soil; hydrocarbons and chloride in groundwater	Phase I and Phase II ESAs	Phase II ESAs	Proven. Delineated. Metals impacted soil excavated from former meter building footprint.
	MC-23	B-30X Well Site	Leaks/spills at wellhead, possible workover fluids, possible historical fuel spill in vicinity.	E of Production Warehouse	Hydrocarbons in soil and groundwater.	Phase II ESA	Phase II ESAs, geophysical survey, well abandoned, cut & capped.	Proven, further delineation required to the west.
	MC-24	Historical AST	Potential leaks/spills	Field Services Storage Pad / Yard D	Hydrocarbons in soil	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-25	Former Helicopter Pad	Potential for fuel leaks/spills	N of Field Services Storage Pad	Hydrocarbons	Aerial photographs	Phase I ESA	Potential. Not investigated directly under pad. Some soil investigation to east of pad.
	MC-26	Warehouse Storage Yard	Potential for leaks/spills from multiple years of equipment storage on ground. Some bermed areas. Barrel dock.	Production Warehouse Yard	Hydrocarbons, metals and salts.	Aerial photographs	Phase I & II ESAs	Preliminary Phase II ESA, not fully investigated.

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland Central (cont'd)	MC-27	Ground disturbance and bermed area	Unknown - potential for spills from C-30X well	W of C-30X Well Site	Hydrocarbons and salts	Aerial photographs	Phase I ESA, limited Phase II ESA	Potential. Little investigation.
	MC-28	Material (metal, wood debris) pushed over bank	Leaching from debris	Area NW of F-31X Injection Facility potentially extending to N of D-31X	Hydrocarbons, metallic debris, etc.	Aerial photographs, Preliminary site visit	Phase I ESA	Potential. Not investigated in detail.
	MC-29	Bermed area.	Potential for impact from bermed fluids	S of F-31X Injection Facility	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-30	Historical Pit	Pit contents	SW of H-31X Well Site	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-31	Historical Pit	Pit contents	NW of F-33X wellhead	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-32	Historically cleared and bermed area	Potential buried oil/wax area	West of Tank 401 pump building	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-33	Historical Pit	Pit contents	D-35-1X Well Site	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-34	Historical Pit	Pit contents	E of F-35X well pad	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-35	Historical Building and AST	Potential for leaks/spills from tank/building	E of Battery #3	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-36	Historical Pit	Pit contents	Southwest corner of Battery #3 Flare Pit	Hydrocarbons and salts, buried debris	Aerial photographs	Phase I ESA, Preliminary Phase II ESA, Remedial Excavation	Proven, investigated, remediated
	MC-37	Historical AST	Spills/leaks from AST	Along road NE of Battery #3 Flare Pit, NW of C-34X wellsite	Hydrocarbons and salts	Aerial photographs	Phase I ESA, geophysical surveys	Potential. Not investigated.
	MC-38	Historical ground disturbance	Unknown	S of D-34X well	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	MC-39	Potential dump site	Dump contents - metallic debris, potential leaked fluids	S of Biocells and Warehouse Access Road	Metal, household garbage	Interviews, Preliminary Phase II ESA/Remedial Excavation (ARB)	Phase I ESA, Remedial Excavation (ARB)	Impacts associated with MC16 have been removed. No evidence of MC-39 encountered during remedial excavation activities and subsequent delineation test-pitting
	MC-40	Potential buried pit	Pit contents	NE of E-32-1X wellsite	Contents unknown	Aerial Photographs	Phase I ESA	Potential. Not investigated.
	MC-41	Potential buried pit	Pit contents	N of C-34-1X wellsite	Contents unknown	Interviews	Phase I ESA	Potential. Not investigated.
	MC-42	Historical flowline release	Residual PHCs in soil inaccessible during initial cleanup	N of D-36X wellsite	Hydrocarbons in soil, potentially groundwater	Operations spill	Very limited Phase II investigation in 1993, 2002 to W of spill area.	Potential.
	MC-43	Potential Historical spill site	Unknown	SE of C-30X wellsite	Hydrocarbons in subsurface soil, potentially groundwater	Phase II ESA	Limited Phase II ESA - one borehole	Proven. Not fully characterized or delineated
	MC-44	Potential grave site	None	SE of D-36X wellsite	Cultural / Heritage concern only	Anecdotal	Site reconnaissance	Potential
	MC-45	E-33X Wellsite	Wellhead leaks, potential spill of workover fluids	E-33X Wellsite	Hydrocarbons in soil	Phase II ESA	Phase II ESA	Proven. Not fully delineated
	MC-46	EnGlobe Soil Washing Pad	Potential spill of soil treatment chemicals, potential overflow of salt-impacted water from holding pond	Former B-33X Wellsite, Biocell 1	Salts	Visual / Site Inspection	Limited Phase II ESA	Investigated, no impacts identified
	Footnote 1	Wellsites and Supporting Infrastructure	Spills & leaks from wellheads, workover fluids, tanks	Mainland Central	Hydrocarbons and salts from operations	Phase I & II ESAs	Phase I & II ESAs at select well sites	Proven. Preliminary investigation at E-33X
Mainland East								
	ME-1	Historical dump site	Buried debris	NW of C-36X wellsite	Inert debris, metals from buried pipe and metal debris	Interviews	Phase I & II ESAs	Preliminary investigation. Hand auger. No issues identified.
	ME-2	Historical dump site	Buried debris, PHC from historical well blowout	SW of C-36X wellsite	Hydrocarbons, metals and salts. Possible buried small drill rig. C-36X well had historic blowout that covered surrounding area/buildings (e.g. church) with oil.	Interviews	Phase I & II ESAs, geophysical surveys, on-going monitoring	Proven. Partially delineated.

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland East (cont'd)	ME-3	C-38X Wellsite	Historical flowline release - PHCs and salts	W of Old Fire Hall	Residual hydrocarbons in excavation walls following flowline break (Line 405)	Phase II ESA	Phase II ESA	Proven, partially delineated, partially remediated.
	ME-4	Historical B-38X Buried Pit	Pit contents - drilling waste with PHCs	W of B-38X wellsite	Residual hydrocarbons after remediation, hydrocarbons in groundwater	Aerial photographs/Phase II ESA	Phase I & II ESAs, geophysical surveys, remedial soil excavation & backfill, on-going monitoring	Proven. Partially remediated, further delineation required.
	ME-5	Two pits/ponds	Pit contents - suspected flare/burn pits so PHCs, salts, metals	S of B-39X	Buried metal, hydrocarbons	Aerial photographs	Preliminary Phase II ESA	Proven. Further delineation required. Hydrocarbons in soil. SAR. E38
	ME-6	B-38X Area (Fire Training Area etc.)	B-38X well fluids, historical naphtha spill, spills from former ASTs, fluids released in FTA, 8 Bay Warehouse (earthen floor)	W of Mainland Tank Farm	Hydrocarbons in soil and groundwater; salt in soil near the B-40X wellsite	Phase I & II ESAs	Phase I and II ESAs, geophysical surveys, installation of groundwater remediation system dual phase extraction trenches, ongoing groundwater monitoring	Proven. Delineation. Partially remediated.
	ME-7	Former Refinery Site	Multiple sources associated with historic infrastructure spills, leaks	S of Mainland Tank Farm & B-38X area	Hydrocarbons, metals and salts in soil and groundwater	Phase II ESAs	Phase I and II ESAs, geophysical surveys	Proven. Partially delineated. Selective excavation & off site landfill of surface metal impacted soil. Issue with dated Phase II information - most collected pre-2003.
	ME-8	Former Drum Cleaning Area	Spills and leaks from drums, cleaning fluids	E of old API Separator	Caustic used to clean drums	Interviews	Phase I & II ESAs	Potential
	ME-9	Old garage site, possible pit/sump	Pit contents, spills/leaks from garage activities	Current N.W.T.P.C. site	Hydrocarbons and metals from garage waste, fuel spills, etc.	Interviews	Phase I & II ESAs	Investigated. No issues identified but access was somewhat limited due to current infrastructure proximity.
	ME-10	Historical Reduced Crude Flare Pit	Fluids disposed to flare pit	N of Mainland Tank Farm	Chloride in groundwater, some residual salt in soil	Phase II ESA	Phase II ESA, Remedial excavation	Proven, delineated, remediated, restoration ongoing
	ME-11	Potential Historical Pit and debris	Pit contents	N of Mainland Tank Farm (Tanks 103/101)	Buried debris, metal, hydrocarbons	Aerial photographs	Phase I ESA, limited Phase II and geophysical surveys	Investigated. No issues identified.
	ME-12	Mainland Tank Farm	Leaks & spills from ASTs	N of former Refinery site	Hydrocarbons in soil and groundwater	Phase II ESA	Phase I & II ESAs	Proven, not delineated
	ME-13	Former pipe racks and storage yard	Metal debris, leaks & spills	Under current Mainland Tank Farm	Buried metal, hydrocarbons	Interviews	Phase I ESA	Potential
	ME-14	Historical Dump site	Leaks from buried drums	Exact location not known. Assumed to be NE of RCFP, S of main access road	Hydrocarbons and metals. Possible buried barrels (6,000 old diesel barrels), beside old ball diamond.	Interviews	Phase I ESA	Potential. Not investigated.
	ME-15	Former B-42X Wellsite	Wellhead leaks, workover fluid spills	SE of Mainland Tank Farm	Hydrocarbons and metals in soil east of the wellsite	Phase II ESA	Preliminary Phase II ESA, well abandonment, wellhead cut & cap, supplementary Phase II ESA	Proven. Not delineated to East.
	ME-16	Old well #3	Wellhead leaks, workover fluid spills	Under road down to Public Works dock	Hydrocarbons, salts. Well was drilled in 1939. Unknown use/owner	Interviews	Phase I ESA	Potential
	ME-17	Refinery Bank	Former API separator, historical fuel line & loadline valve leaks	Bulk Fuels Unloading Dock	Hydrocarbons in soil and groundwater.	Phase II ESA	Phase I & II ESAs, geophysical surveys, installation of groundwater remediation system, ongoing groundwater monitoring	Proven. Partially remediated.
	ME-18	Former Construction Campsite	Leaks and spills from ASTs in NE corner of site	NE of B-35X well site	Hydrocarbons, metals, salts in soil.	Phase I ESA	Phase I & II ESAs	Investigated. Some metals exceedances.
	ME-19	Former Fuel Tanks / Pumps	Leaks and spills from fuel ASTs	Flint Shop / Frontier Warehouse / Fluid hauling services shop	Hydrocarbons in soil.	Phase I ESA	Phase I & II ESAs	Proven, partially delineated.

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland East (cont'd)	ME-20	Drum Storage Yard	Leaks and spills from drums	South of N.W.T.P.C. Yard	Hydrocarbons in soil	On-site observations	Phase I ESA, Preliminary Phase II ESA	Proven, partially delineated.
	ME-21	Town Lease 3	Leaks and spills from historical site operations (materials storage, wellsite activities)	East of D-44X wellsite	Salts and hydrocarbons in soil	Aerial Photographs	Phase I & II ESAs, geophysical survey	Investigated, proven, delineated, remediated.
	ME-22	D-42X	Historical spill location	D-42X wellsite	Hydrocarbons and salts	Spill Report	Preliminary Phase II ESA	Investigated, proven, not delineated.
	ME-23	East End of Lease. Historical Storage area	Leaks and spills from stored materials	ESE of C-44X wellsite	Hydrocarbons, debris	Aerial Photographs	Historical photo review	Potential, not investigated.
	ME-24	Wireline Shop and Contractor Shop	Leaks and spills from shop activities	Wireline Shop, Vehicle Wash Bay	Hydrocarbons, salts, solvents	Long Term Operations. On-site Observations	Soils not investigated in detail. One piezometer on west side of wireline shop.	Potential
	ME-25	Bermed Area - potential former AST location	Leaks and spills from potential former tank	Northeast Corner of Flint Yard	Hydrocarbons	Aerial Photographs	Not investigated to date	Potential
	ME-26	ASTs	Leaks and spills	South Side of Flint Yard	Hydrocarbons	Aerial Photographs	Not investigated to date	Potential
	ME-27	Ground Disturbance AST	Unknown	West side of B-35X wellsite adjacent main access road	Hydrocarbons	Aerial Photographs	Partial coverage by geophysical survey completed for B-35X wellsite	Potential
	ME-28	Unknown historical structure on Embankment, Location of Discovery Well #1	Potential leaks and spills from well drilling, operation	SW of C-37X wellsite, S of E-36X well	Hydrocarbons and salts	Aerial Photographs, Site Inspection	Not investigated to date	Potential
	ME-29	Unknown structures on Embankment	Unknown	West of D-39X wellsite	Hydrocarbons and salts	Aerial Photographs	Not investigated to date	Potential
	ME-30	ASTs	Leaks and spills from tanks	North of D-39X wellsite	Hydrocarbons and salts	Aerial Photographs	Not investigated to date	Potential
	ME-31	Bulk Sales Yard	Fuel leaks and spills	Bulk Sales Yard	Hydrocarbons, solvents	Long term Operations. Aerial Photographs	Not investigated to date	Potential
	ME-32	Storage Area	Leaks and spills from historical site operations (materials storage)	East of B-42X Wellsite	Hydrocarbons, salts, solvents, metals	Long term Operations. Aerial Photographs	Not investigated to date	Potential
	ME-33	Historical AST	Leaks and spills from tank	North of road past C-38X pad to Tank Farm	Hydrocarbons	Aerial Photographs	Not investigated to date	Potential
	ME-34	Potential dump site	Leaks, spills from buried drums, metal debris, etc.	Southwest of RCFP	Hydrocarbons and debris	Interview, IOL map of known dump sites	Phase I ESA, limited Phase II ESA	Proven, not delineated, access restricted.
	ME-35	Potential old warehouse site	Leaks and spills from stored materials	West of D-41X well	Metals, hydrocarbons, salts, metal debris	Interviews	Phase I ESA	Potential, not investigated.
	ME-36	Sheet pile, metal debris	Unknown	North of C-41X well	Metal debris	Interviews	Phase I ESA	Potential, not investigated.
	ME-37	A-45X Wellsite	Wellhead leaks, workover fluid spills	West side of Town Site	Hydrocarbons, salts, metals	Phase I ESA	Phase I & II ESAs, geophysical surveys, remedial soil excavation & backfill, groundwater monitoring	Proven, investigated, remediated
	ME-38	Former Drill Pad	Leaks and spills from historical site activities	N of 8-Bay Building in muskeg area	Hydrocarbons, salts, metals	Aerial Photographs	Site visit, surface solids sample collected	Potential, not investigated.
	Footnote 1	Wellsites and Supporting Infrastructure	Spills & leaks from wellheads, workover fluids, tanks	Mainland East	Hydrocarbons and salts from operations	Phase I ESA	Phase I & II ESAs at selected well sites	Proven. Preliminary investigation at B-42X

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Mainland Sumps	MS-1	Former Mainland Drilling Sump	Buried drilling waste	W of Airport	Residual salts and metals in soil; chloride and metals in groundwater	Phase II ESA, Remediation Report	Phase I & II ESAs, geophysics, sump capped	Proven, delineated. Sump contents remain in place.
	MS-2	Former Well Services Sump	Residual bedrock impact following source removal	W of Airport	Chloride and hydrocarbons in groundwater near East Cell, residual hydrocarbons in bedrock.	Phase II ESA, Remediation Report	Phase I & II ESAs, geophysics, sump contents excavated, sump backfilled	Proven, delineated, remediated.
	MS-3	Former Sumps 1 - 6	Buried drilling waste	N of Mainland and Well Services Sump	Hydrocarbons, salts in soil, chloride in groundwater.	Phase I ESA, Phase II ESA	Phase I & II ESAs, geophysics, sumps infilled	Proven, delineated. Sump contents remain in place. Subsidence areas backfilled and capped with clean fill to grade.
Mainland Other								
	MO-1	Historical Dump site	Leaks, spills from buried metal, drums, etc.	SW of Seepage Lake	Possible diesel impact	Interviews	Phase I ESA	Potential
	MO-2	Seepage Lake	Debris potentially on lake bottom	Seepage Lake	Anecdotal information suggests historically disposed of warehouse debris on ice in winter, let sink to lake bottom in spring.	Interviews	Phase I ESA	Potential
	MO-3	Historical Dump site	Leaks, spills from dump contents	West end of airport runway / South Side	Buried debris, metals, hydrocarbons	Aerial photographs	Phase I ESA	Potential
	MO-4	Former Operations Landfarm over Historical Dump Site	Leaks, spills from dump contents, residual PHC from landfarmed soil	West end of airport runway / North Side	Hydrocarbon impacted soil. Near surface. Buried debris.	Aerial photographs	Phase I & II ESAs for surface soils only.	Proven. Delineated, Landfarm Area Remediated.
	MO-5	Historical Dump Site	Leaks, spills from dump contents	West end of airport runway / North Side	Buried debris, metals, hydrocarbons	Aerial photographs	Phase I ESA	Proven metal debris, not investigated
	MO-6	Potential buried crushed barrels	Leaks, spills from dump contents	SW of Mainland Sumps area	Buried debris, metals, hydrocarbons	Interview, IOL map of known dump sites	Phase I ESA	Potential
	MO-7	Potential historic drainage ditch	Unknown	Between Seepage Lake and Bosworth Creek	Unknown	Interview	Phase I ESA	Potential
Bear Island								
	BI-1	Old drill pad for Bear Island #1 well	Wellhead leaks, workover fluid spills	W of B.I.T. #5	Buried debris, drill muds/fluids	Aerial photographs	Phase I & II ESAs, remedial excavation	Proven, delineated, remediated. BI1
	BI-2	Historical Tanks and Buildings	Leaks, spills from infrastructure, activities	W of Sump #1	Buried metal, hydrocarbons, debris	Aerial photographs	Phase I & II ESAs	Limited investigation, no issues identified but visible debris in trees. BIR34
	BI-3	Former Tank Farm (BIBT1)	Leaks, spills from crude oil / fuel tanks	North of Sump #2	Hydrocarbons, limited salts	Phase I ESA	Phase I & II ESAs, geophysics, remedial excavation with soils stockpiled at B.I.T. #5	Proven, delineated, remedial action plan developed. Soils and Groundwater.
	BI-4	Sumps 1 to 5	Buried drilling waste	E of B.I.T. #5	Proven hydrocarbons and salts in soil, proven chloride in groundwater	Phase I/Phase II ESA	Phase I & II ESAs, geophysics	Proven, delineation partially completed.
	BI-5	Former Tank Farm	Leaks and spills from ASTs	North of Sump #3	Hydrocarbons in soil	Aerial photographs	Phase I ESA	Potential
	BI-6	Former Fuel Storage Area	Leaks and spills from ASTs	SW of P-37X	Hydrocarbons in soil	Phase II ESA	Phase I & II ESAs	Proven, not delineated. However, area was lined so impact expected to be in surface soil only.

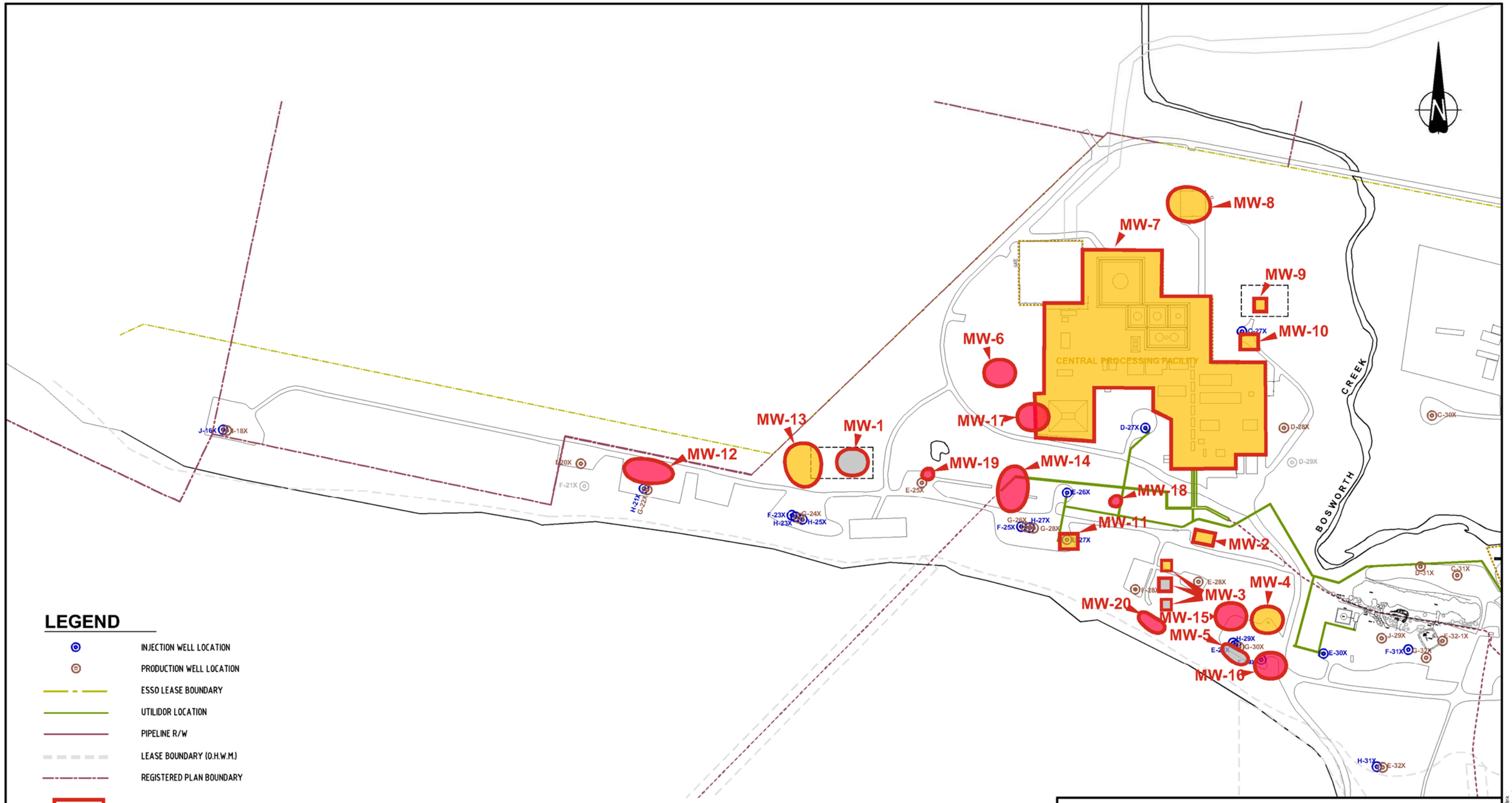
Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Bear Island (cont'd)	BI-7	Tank Farm	Leaks and spills from ASTs	Q-38X well pad	Hydrocarbons and metals in soil	Phase II ESA	Phase I & II ESAs	Proven. Minor surface impacts. Tank area is lined and bermed so limited impact.
	BI-8	B.I.T. #4 Pigging Station	Leaks and spills from pigging operations	B.I.T. #4	Hydrocarbons, waxes	Phase I ESA	Phase I & II ESAs	Proven. Not delineated
	BI-9	B.I.T. #4 Flowline break	Released flowline fluids	S of B.I.T. #4	Hydrocarbons	Phase I ESA	Phase I ESA	Potential. Not investigated.
	BI-10	Former Bear Island Flare Pit, potential drill pad	Fluids disposed in flare pit, flare line leaks	N of N-42X	Hydrocarbons and metals from buried debris or drill muds/fluids	Aerial photographs	Phase I & II ESAs, geophysics	Proven, delineated, remedial action plan developed. Flare Pit source removal completed. Proven impact to east and south of pit.
	BI-11	Former Battery and tank farm	Leaks and spills from battery infrastructure, ASTs, flowlines	N-42X well pad	Hydrocarbons and salts in soil and groundwater	Phase II ESA	Phase I & II ESAs, geophysics	Proven
	BI-12	N-44X (Also called BISS2)	Fluids released from flowline	E of N-44X	Residual hydrocarbons in soil	Phase II ESA	Phase II ESA, Geophysics	Proven. Delineated, remediated. Operations conducted source excavation to groundwater and backfilled.
	BI-13	N-45X (Historical spill site, also called BISS)	Fluids released from flowline	N of N-45X	Residual hydrocarbons in soil	Phase II ESA	Phase II ESA, Geophysics	Proven. Delineated, remediated. Operations conducted source excavation to groundwater and backfilled.
	BI-14	O45X/O46X Spill site (Also called BISS3)	Fluids released from flowline break	N of O-46X	Residual hydrocarbons and salinity impacts in soil	Phase II ESA	Phase II ESA, Geophysics	Proven.
	BI-15	Sump #6	Buried drilling waste	SE of N-47X	Hydrocarbons and salts in soil, chloride in groundwater	Phase II ESA	Phase I & II ESAs	Proven. Delineated.
	BI-16	M-43X Line Break	Fluids released from flowline break	M-43X	Hydrocarbons and salts	Spill Report	Phase II ESA, remedial excavation	Proven, delineated, RAP developed, remediated. M43
	BI-17	Former Tank Farm	Leaks and spills from ASTs	South of R-36X	Hydrocarbons and salts. Debris	Aerial photographs	Phase I & II ESAs	Proven. Partially delineated.
	BI-18	Former Tank Farm	Leaks and spills from ASTs	B.I.T. #5	Hydrocarbons and salts	Aerial photographs	Preliminary Phase II ESA	Potential. Not fully investigated. Shallow PHC F2 impact at BIBG-10-3.
	BI-19	Former Storage Area	Leaks and spills from stored equipment/materials	Q Pad	Hydrocarbons	Aerial photographs	Phase I ESA	Potential. Not investigated.
	BI-20	Historical Pit	Pit contents	P-37X	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	BI-21	Unexplained Clearing	Unknown	P-38X	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	BI-22	Historical Pit	Pit contents	N-39X	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	BI-23	Historical Pit / Soil Pile	Unknown	O-43X	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	BI-24	Historical Pit	Unknown	N-45X	Hydrocarbons and salts	Aerial photographs	Phase I ESA	Potential. Not investigated.
	BI-25	Unexplained Clearings	Unknown	O-46X	Hydrocarbons and salts	Aerial photographs	Phase I ESA, Geophysics	Potential. Not investigated.
	BI-26	Former AST location	Leaks and spills from AST	SE of Sump #1	Hydrocarbons	Aerial photographs Phase II ESA	Phase I & II ESAs	Proven. Not delineated.
	BI-27	Pipeline release at O-43X	Fluids from flowline	O-43X	Hydrocarbons and salts	Preliminary Phase II ESA	Preliminary Phase II ESA	Proven. Not delineated.
	BI-28	Pipeline release at Q-43X	Fluids from flowline	Q-43X	Hydrocarbons and salts	Preliminary Phase II ESA	Preliminary Phase II ESA	Proven. Not delineated.
	Footnote 1	Wellsites and Supporting Infrastructure	Spills & leaks from wellheads, workover fluids, tanks	Bear Island	Hydrocarbons and salts from operations	Phase I	Preliminary Phase II ESAs at selected sites	Potential

Table App.4-1
Areas of Proven or Potential Environmental Concern (APECs)

Site Area	APEC #	Description	Contaminant Source(s)	Closest Infrastructure / Reference Point	Environmental Concerns	Information Source	Investigation Work Completed to Date	Current Status (Potential / Proven)
Goose Island								
	GI-1	Fuel Storage Area	Fuel tank leaks and spills	E of Q-8X	Hydrocarbons and salts in soil	Phase II ESA	Phase I & II ESAs, geophysical survey	Proven, delineated. Soils GIQ8
	GI-2	Former Camp	Leaks and spills from stored equipment/materials	NE of Q-10X	Buried debris, metal, hydrocarbons	Aerial photographs	Phase I & II ESAs	Investigated, no issues identified to date. GIQ10
	GI-3	Former sump or borrow pit	Sump contents?	SE of P-9X	Buried debris, metal, hydrocarbons	Aerial photographs	Phase I & II ESAs	Investigated, no issues identified to date. GIP9
	GI-4	Former Tank Farm	Leaks and spills from tanks	SW of P-11X	Hydrocarbons and salts	Aerial photographs	Phase I & II ESAs	Proven chloride impact in subsurface soils, not delineated to south. Soils GIP11
	GI-5	Historical Spill Site	Spilled fluids - likely emulsion	O-14X Well Pad	Hydrocarbons and salts	Spill Reports	Phase I & II ESAs	Investigated, no issues identified. GIO14
	GI-6	O-18X Pipeline Break	Spilled fluids - emulsion	O-18X Well Site	Hydrocarbons and Salts	Spill Reports	Phase II ESA, remedial excavation	Investigated. Proven, delineated. RAP prepared. Partially remediated (source removal). Monitoring in place.
	GI-7	Q-06X Pipeline release	Spilled fluids - emulsion	Q-06X Well Site	Hydrocarbons and Salts	Spill Reports	Phase II ESA, geophysical survey	Investigated. Proven. Delineated. RAP prepared. Partially remediated.
	GI-8	Possible old Burn Pit	Fluids/gases disposed and/or combusted in pit	G.I.T. 4	Hydrocarbons, salts	Anecdotal report from Operations personnel	Preliminary soil investigation	Potential (limited investigation completed to date)
	Footnote 1	Wellsites and Supporting Infrastructure	Spills & leaks from wellheads, workover fluids, tanks	Goose Island	Hydrocarbons and salts from operations	Phase I & II ESAs	Phase I & II ESAs, wellhead/bunker removal at selected sites	Proven, initial investigations at O-29X and T-08X.
Frenchy's Island								
	FI-1	Wellsites	Leaks and spills from wellheads, workover fluids	J-52X wellsite	Hydrocarbons, salts	Phase I ESA	Phase I ESA, preliminary Phase II ESA	Initial investigation, no issues identified.
Artificial Island 1	AI1-1	Former Barrel Dock	Spills & leaks	AI1	Hydrocarbons in surface soils	Phase I ESA	Preliminary Phase II ESA	Proven
	AI1-2	Wellsites and Storage Tanks	Spills & leaks from wellheads, workover fluids, tanks	AI1	Hydrocarbons	Phase I ESA	Phase I ESA	Potential
Artificial Island 2	AI2-1	Wellsites and Storage Tanks	Spills & leaks from wellheads, workover fluids, tanks	AI2	Hydrocarbons, salts	Phase I ESA	Phase I ESA	Potential
Artificial Island 3	AI3-1	Wellsites and Storage Tanks	Spills & leaks from wellheads, workover fluids, tanks	AI3	Hydrocarbons, salts and glycols	Phase I ESA	Phase I ESA	Potential
Artificial Island 4	AI4-1	Wellsites and Storage Tanks	Spills & leaks from wellheads, workover fluids, tanks	AI4	Hydrocarbons, salts and glycols	Phase I ESA	Phase I ESA	Potential
Artificial Island 5	AI5-1	Wellsites and Storage Tanks	Spills & leaks from wellheads, workover fluids, tanks	AI5	Hydrocarbons, salts	Phase I ESA	Phase I ESA	Potential
Artificial Island 6	AI6-1	Wellsites and Storage Tanks	Spills & leaks from wellheads, workover fluids, tanks	AI6	Hydrocarbons, salts	Phase I ESA	Phase I ESA	Potential

Footnote 1 APECs for most individual wellsites and supporting infrastructure are not illustrated on figures accompanying this table.
AG = above ground; UG = underground
AST = above ground storage tank; UST = underground storage tank



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- ESSO LEASE BOUNDARY
- UTILIDOR LOCATION
- PIPELINE R/W
- LEASE BOUNDARY (O.H.W.M.)
- REGISTERED PLAN BOUNDARY
- APEC AREA BOUNDARY (APPROXIMATE)
- NOT INVESTIGATED
- INVESTIGATED - PROVEN - NOT DELINEATED
- INVESTIGATED - PROVEN - DELINEATED
- INVESTIGATED - NO ISSUES/REMEDIATED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013.

m 0 100 200 300 m

1:6000

IMPERIAL
NORMAN WELLS, NT

AREAS OF PROVEN OR POTENTIAL ENVIRONMENTAL CONCERN MAINLAND WEST

Date: 16-JAN-17	Drawn by: OTHERS	Edited by: B.M.F.	App'd by: MB
Advisian WorleyParsons Group		WorleyParsons Project No. 407074-00821	
		FIG No 2	REV A

This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.

PLOT DATE & TIME: 16/1/2017 3:29:42 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/1/2017 3:20:35 PM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407074-00821\100 - ENV LIABILITY ESTIMATE\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00821-100-00-EN-DWG-2013-MAINLANDWEST.DWG

FILE LOCATION: U:\CAL\GBS\407074-00821\100 - ENV LIABILITY ESTIMATE\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00821-100-00-EN-DWG-2013-MAINLANDCENTRAL.DWG

PLOT DATE & TIME: 17/1/2017 10:54:07 AM
SAVE DATE & TIME: 16/1/2017 4:44:50 PM
USER NAME: blin.flirk
ISSUING OFFICE: CALGARY

MO-7
MC-26
MC-23
MC-6
MC-25
MC-24
MC-16
MC-39
MC-27
MC-43
MC-17
MC-37
MC-7
MC-18
MC-41
MC-28
MC-36
MC-21
MC-8
MC-35
MC-40
MC-10
MC-11
MC-22
MC-1
MC-30
MC-19
MC-32
MC-42
MC-9
MC-12
MC-29
MC-4
MC-45
MC-13
MC-14
MC-34
MC-44
MC-2
MC-5
MC-38
MC-20
MC-30
MC-15
MC-33
MC-31

FLARE STACK
IMPERIAL OIL LEASE BOUNDARY
CANOL DRIVE
C-27Z SUMP
C-27X
C. P. F.
AL PROCESSING FACILITY
PRODUCTION OFFICE
TRADE SHOP
BOSWORTH CREEK
WAREHOUSES
PRODUCTION WAREHOUSE
B-30X
SERVICES YARD
WASTE YARD
STORAGE PAD
FORMER HELIPAD
FIELD SERVICES STORAGE PAD
FLUID HAULING SERVICES SHOP
B-33X
B-35X
C-32X
PIPELINE
C-34X
C-34-1X
C-36X
L.H.#3 BLDG
MDS
BOSWORTH CREEK/BATTERY #3
FORMER REDUCED CRUDE FLARE PIT
LT3 GAS MAN. BLDG
WIRELINE SHOP
WELDING SHOP
L.T.6 GAS MAN. BLDG
GAS LIFT BLDG
FLOWLINE
C-38X
C-37X
E-36X
E-39X
D-39X
B-39X
E-40X
D-34X
E-35X (NEB)
E-35X (FHEL)
F-35X
MARINA
ONSITE DOCK
L.H. #1 BLDG
LT1
BLDG

LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- ESSO LEASE BOUNDARY
- UTILIDOR LOCATION
- PIPELINE R/W
- LEASE BOUNDARY (O.H.W.M.)
- REGISTERED PLAN BOUNDARY
- APEC AREA BOUNDARY (APPROXIMATE)
- NOT INVESTIGATED
- INVESTIGATED - PROVEN - NOT DELINEATED
- INVESTIGATED - PROVEN - DELINEATED
- INVESTIGATED - NO ISSUES/REMEDIATED

m 0 100 200 300 m

1:6000

IMPERIAL
NORMAN WELLS, NT

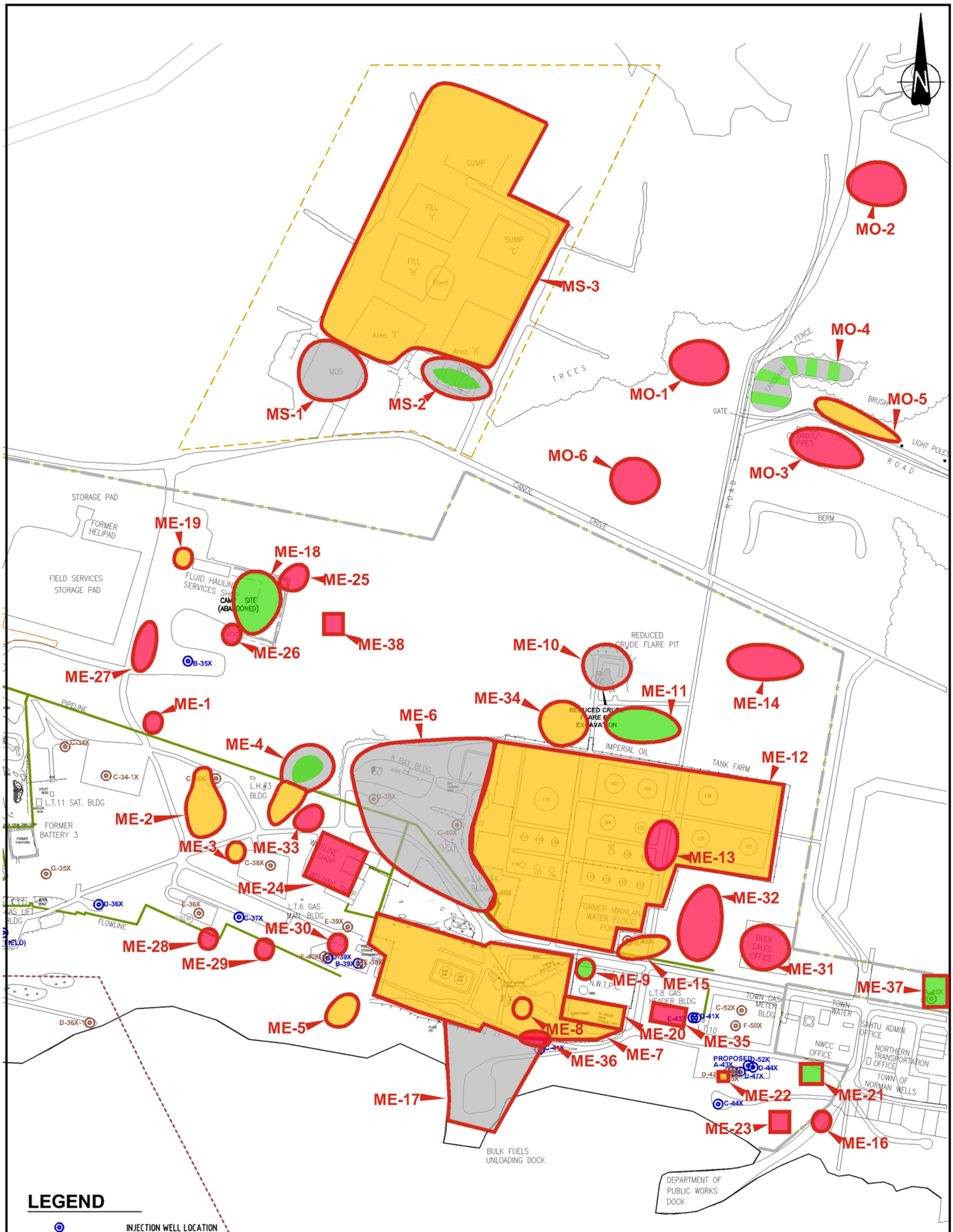
AREAS OF PROVEN OR POTENTIAL ENVIRONMENTAL CONCERN MAINLAND CENTRAL

Date:	Drawn by:	Edited by:	App'd by:
16-JAN-17	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407074-00821
FIG No: 3
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- ESSO LEASE BOUNDARY
- UTILIDOR LOCATION
- PIPELINE R/W
- LEASE BOUNDARY (O.H.W.M.)
- REGISTERED PLAN BOUNDARY
- APEC AREA BOUNDARY (APPROXIMATE)
- NOT INVESTIGATED
- INVESTIGATED – PROVEN – NOT DELINEATED
- INVESTIGATED – PROVEN – DELINEATED
- INVESTIGATED – NO ISSUES/REMEDIATED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)

IMPERIAL
NORMAN WELLS, NT

AREAS OF PROVEN OR POTENTIAL ENVIRONMENTAL CONCERN MAINLAND EAST AND MAINLAND SUMPS

Date:	Drawn by:	Edited by:	App'd by:
16-JAN-17	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407074-00821

FIG No 4 | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 17/1/2017 9:56:07 AM USER NAME: blan.flink
SAVE DATE & TIME: 17/1/2017 9:49:36 AM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407074-00821\100 - ENV LIABILITY ESTIMATE\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00821-100-00-EN-DWG-2013-2013-MAINLANDEAST.DWG

LOT 1007 LEASE No. 96 E/7-15-2
ISLAND 5 (ITEH K'EE)

PRODUCING WELLS		INJECTION WELLS	
M-31X	K-36X	J-31X	L-33X
M-32X	K-37X	J-33X	L-34X
M-34X	I-32X	J-35X	L-35X
M-37X	I-34X	J-36X	L-36X
K-32X	I-36X		L-37X
K-33X			
K-34X			

PLAN 69807 C.L.S.R. (L.T.O. No. 1732)
LOT 1008 LEASE No. 96 E/7-14-2
ISLAND 6 (LITTLE BEAR)

PRODUCING WELLS		INJECTION WELLS	
I-40X	K-40X	J-37X	J-43X
I-42X	K-42X	J-39X	L-39X
K-38X	M-40X	J-41X	L-41X

MACKENZIE RIVER

FRENCHY'S ISLAND
LEASE No. L-3175T

BEAR ISLAND
LOT 8 REMAINDER GROUP 1158
PLAN 52019 C.L.S.R.

LEASE No. L-2824T

LEASE No. 96 E/7-26-4

BI-1 BI-2 BI-3 BI-4 BI-5 BI-6 BI-7 BI-8 BI-9 BI-10 BI-11 BI-12 BI-13 BI-14 BI-15 BI-16 BI-17 BI-18 BI-19 BI-20 BI-21 BI-22 BI-23 BI-24 BI-25 BI-26 BI-27 BI-28

FI-1

LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- ESSO LEASE BOUNDARY
- UTILIDOR LOCATION
- PIPELINE R/W
- LEASE BOUNDARY (O.H.W.M.)
- REGISTERED PLAN BOUNDARY
- APEC AREA BOUNDARY (APPROXIMATE)
- NOT INVESTIGATED
- INVESTIGATED - PROVEN - NOT DELINEATED
- INVESTIGATED - PROVEN - DELINEATED
- INVESTIGATED - NO ISSUES/REMEDIATED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013.

m 0 250 500 750 m

1:12500

IMPERIAL
NORMAN WELLS, NT

AREAS OF PROVEN OR POTENTIAL ENVIRONMENTAL CONCERN BEAR ISLAND

Date:	Drawn by:	Edited by:	App'd by:
16-JAN-17	OTHERS	B.M.F.	MB

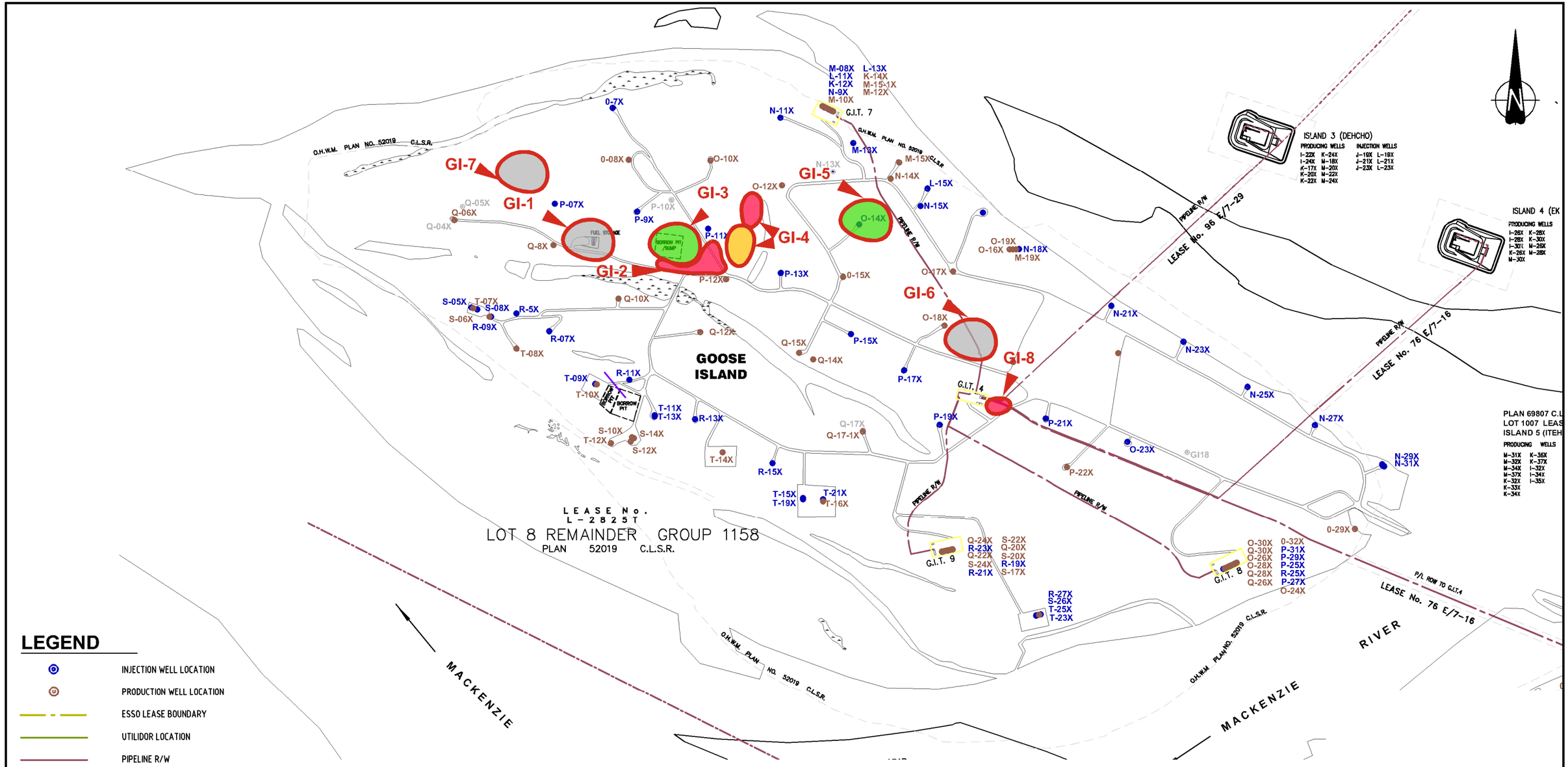
Advisian
WorleyParsons Group

WorleyParsons Project No.: 407074-00821
FIG No: 5
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 17/1/2017 10:37:49 AM
SAVE DATE & TIME: 17/1/2017 10:36:39 AM
USER NAME: bkn
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407074-00821\100 - ENV LIABILITY ESTIMATE\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00821-100-00-EN-DWG-2013-BEARISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- ESSO LEASE BOUNDARY
- UTILIDOR LOCATION
- PIPELINE R/W
- LEASE BOUNDARY (O.H.W.M.)
- REGI-STERED PLAN BOUNDARY
- APEC AREA BOUNDARY (APPROXIMATE)
- NOT INVESTIGATED
- INVESTIGATED - PROVEN - NOT DELINEATED
- INVESTIGATED - PROVEN - DELINEATED
- INVESTIGATED - NO ISSUES/REMEDIATED

SOURCES:
1. SITE PLAN AS PER UMA ENGI-NEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013.

IMPERIAL
NORMAN WELLS, NT

AREAS OF PROVEN OR POTENTIAL ENVIRONMENTAL CONCERN GOOSE ISLAND

Date:	Drawn by:	Edited by:	App'd by:
23-MAY-18	OTHERS	BMF	

Advision
WorleyParsons Group

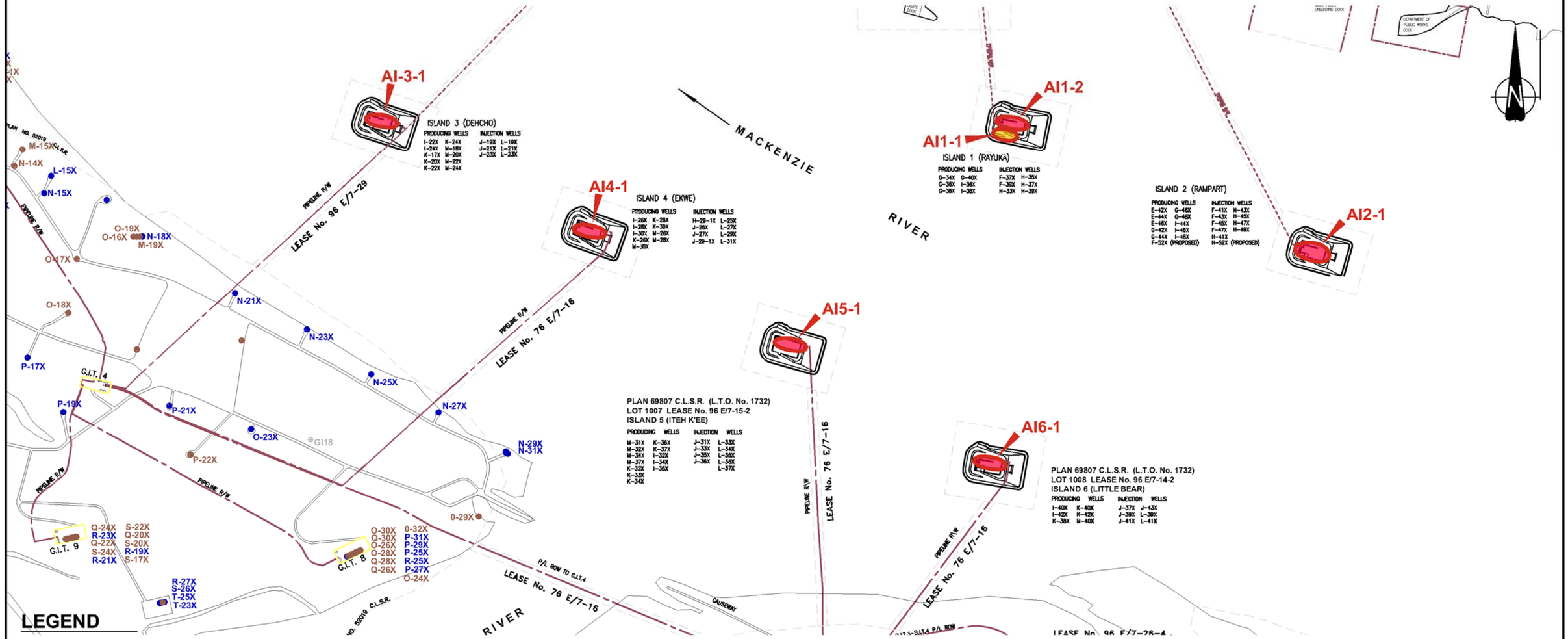
WorleyParsons Project No. 407074-00821

FIG No 6 | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 23/5/2018 3:08:09 PM
SAVE DATE & TIME: 31/3/2017 3:03:21 PM
USER NAME: bfehr
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407074-00821\100 - ENV LIABILITY ESTIMATE\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00821-100-00-EN-DWG-2013-GOOSEISLAND.DWG



SOURCES:
1. SITE PLAN AS PER UMA ENGI-NEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013.

IMPERIAL
NORMAN WELLS, NT

AREAS OF PROVEN OR POTENTIAL ENVIRONMENTAL CONCERN
ARTIFICIAL ISLANDS

Date:	Drawn by:	Edited by:	App'd by:
14-JAN-17	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407074-00821

FIG No 7 | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 17/1/2017 11:06:49 AM
SAVE DATE & TIME: 16/1/2017 3:24:13 PM
USER NAME: bfarley
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407074-00821\100 - ENV LIABILITY ESTIMATE\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00821-100-00-EN-DWG-2013-GOOSEISLAND.DWG

Appendix 5 Conceptual Site Model: Battery #3 Flare Pit



Imperial

Conceptual Site Model

Battery 3 Flare Pit (APEC MC-18), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0001

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

Advisian
WorleyParsons Group

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0001 - Conceptual Site Model: Battery 3 Flare Pit (APEC MC-18), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	 L. Glatiotis/A. Haigh	 M. Brown	 S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 1

Figures

Figure 1 Site Location Map

Figure 2 Historical Air Photo 1985

Figure 3 Site Plan Showing Topography

Figure 4A Site Plan Showing Sampling Locations

Figure 4B Excavation Site Plan Showing Sampling Locations

Figure 5A Site Plan 3-D Visualization

Figure 5B Cross Section A-A' (Southwest to Northeast)

Figure 5C Cross Section B-B' (North to South)

Figure 6A Soil Analytical Results: Salinity Parameters

Figure 6B Excavation Soil Analytical Results: Salinity Parameters

Figure 6C Soil Analytical Results: Organic Parameters

Figure 6D Excavation Soil Analytical Results: Organic Parameters

Figure 7A Groundwater and Surface Water Analytical Results: Dissolved Chloride

Figure 7B Groundwater and Surface Water Analytical Results: Petroleum Hydrocarbon Parameters

Figure 8 Conceptual Site Model

Figure 9 Conceptual Exposure Model, Current Land Use and Site Conditions

Tables

Table 1 Soil Analytical Results: Inorganic Parameters

Table 2 Soil Analytical Results: Organic Parameters

Table 3 Water Analytical Results: Inorganic Parameters

Table 4 Water Analytical Results: Total Metals

Table 5 Water Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE	
Site Description:	Situated to the North of the former Battery #3 (Figures 1 and 2). Access road to the Northwest of the site. Aboveground utilidor to the East of the site. Former Battery #3 Land Farm to the North of the site. Above ground power line to the North of the site.
Current Land Use:	CCME Industrial land use.
Future Land Use:	CCME Industrial land use.
HISTORICAL LAND USE	
Infrastructure type:	Flare pit.
Notes:	Hydrocarbons and salts in soil. Residual metals impact on surface previously removed and disposed off-site.
Years Active:	pre-1950 to pre-2004 (exact dates unavailable, based on air photo database).
SITE SETTING	
Topography and Drainage:	Steep slope to the West of site, down to Bosworth Creek. Surface drainage is generally South to a wetland/marsh area, which limits delineation of impacts in that direction (Figures 3 and 5A/B/C).
Nearby Surface Water Bodies (Distance and Direction):	Bosworth Creek (~ 45 m SW of remedial excavation, 65 m SW of former flare pit). Wetland/marsh area. (~ 5 m South of remedial excavation, 30 m South of former flare pit).
SOIL AND GROUNDWATER CONDITIONS	
Surficial Materials:	Sand, silt, loam, peat, fill (Figures 5B/C).
Depth to Permafrost:	Observed in two boreholes (BT97-13 and BT02-35) at 4.5 mbgs (metres below ground surface) and at 2.6-4.5 mbgs, respectively. Not encountered in other local borehole locations.
Depth to Bedrock:	~ 5 to 8 mbgs
Bedrock Lithology:	Siltstone/shale.
Number of Groundwater-Bearing Zones:	3 (overburden, upper bedrock and lower bedrock).
Number of Piezometers - Overburden:	Active - 2; Inactive – 5 (Figure 4A/B)
Number of Piezometers - Upper	Active - 3; Inactive – 5 (Figure 4A/B)

Bedrock:	
Number of Piezometers - Lower Bedrock:	Active - 0; Inactive – 2 (Figure 4A/B)
Free Product in Upper Groundwater-Bearing Zone:	Not encountered.
Free Product in Secondary Groundwater-Bearing Zone:	Encountered at wells BT3 93-25-X and BT3 99-22-26, between the Former Flare Pit and Bosworth Creek, and other upper bedrock well screens 20+ mbgs in the area. Interpreted to be natural crude oil seepage based on depth and chemistry.
<u>First Groundwater-Bearing Zone</u>	
Primary Soil Type/Lithology:	Silt
Dominant Grain Size:	Fine
Depth to Groundwater Surface:	4.5 mbgs
Hydraulic Conductivity (Minimum):	8.5×10^{-9} m/s
Hydraulic Conductivity (Maximum):	$> 1 \times 10^{-5}$ m/s
Hydraulic Conductivity (Geometric Mean):	2.3×10^{-7} m/s
Lateral Hydraulic Gradient	Not calculated
Groundwater Flow Direction and Velocity:	West towards Bosworth Creek.
Vertical Hydraulic Gradient:	Upwards vertical gradient observed in BT3 97-2-5 and BT3 97-3-8 (P97-30A/B), across bedrock and overburden interface.
<u>Second Groundwater-Bearing Zone</u>	
Primary Soil Type/Lithology:	Siltstone/shale
Dominant Grain Size:	Fine
Depth to Groundwater Surface:	9.0 mbgs
Hydraulic Conductivity (Minimum):	2.9×10^{-7} m/s
Hydraulic Conductivity (Maximum):	$>1 \times 10^{-5}$ m/s
Hydraulic Conductivity (Geometric Mean):	1.3×10^{-6} m/s
Lateral Hydraulic Gradient	i = 0.04 based on 2017 water levels measured at BT3 99-23-13 near flare pit and drivepoint BOS-DP-13-2-1.35 beside Bosworth Creek
Groundwater Flow Direction and Velocity:	West towards Bosworth Creek; velocity of a non-reactive tracer such as chloride estimated to be 8.2 m/year (based on v = Ki/n) and dissolved PHC velocity of 2.1 m/year or less.
Vertical Hydraulic Gradient:	Upwards vertical gradient observed across bedrock and overburden interface.

Third Groundwater-Bearing Zone	
Primary Soil Type/Lithology:	Siltstone/shale
Dominant Grain Size:	Fine
Depth to Groundwater Surface:	~25 mbgs (limited local monitoring wells in this zone due to natural seepage of crude oil and saline water at this depth and below).
Hydraulic Conductivity:	2.0×10^{-9} m/s (based on one K-test conducted at BT3 99-22-26.
Hydraulic Conductivity (Geometric Mean):	NA
Groundwater Flow Direction and Velocity:	West towards Bosworth Creek
Vertical Hydraulic Gradient:	Downwards vertical gradient observed in the bedrock units at BT3 00-28-44 and BT3 00-29-22 (nested piezometer pair, both completed in bedrock).
HISTORICAL ENVIRONMENTAL ACTIVITIES	Soil and groundwater characterization and impact delineation (1993 to present). Remedial pilot testing, GW pumping and dual phase extraction (1999-2000). Remedial excavation - partially complete (2016) with physical limitations due to proximity of adjacent aboveground utilities (North and East) and surface water/wetland (South). Approximately 5,760 m^3 of impacted soil removed, with approximately 2,240 m^3 remaining in-situ for future removal. Backfilled with 6,260 m^3 of clay fill material from the Town of Norman Wells' Clay Pit.
CURRENT STATUS	Remaining soil and groundwater impacts (Figures 6A-D and 7A-B).

Sources and Impacts

SOURCES	
Historical Sources:	Flare Pit (APEC #MC-18, Appendix 4). Flare line(s) running from Flare Pit to Battery #3 infrastructure (South of site). Battery #3 (South of site). Aboveground utilidor (East of site).
Current Sources:	Impacted soil (secondary source). Aboveground utilidor (East of site).

KNOWN ENVIRONMENTAL CONCERNS

a. Soil

Potential Contaminants of Concern:	Hydrocarbons, PAHs, and salinity. Residual metals impacts on surface previously removed and disposed off-site.
Proven Contaminants of Concern:	Hydrocarbons, salinity (EC, SAR) - partially attributed to natural crude and saline water seepage up from bedrock
Lateral Delineation:	Salinity impacts in the excavation were delineated to the southeast, south and southwest. Impacts to the northeast, north and north west remain. Salinity impacts in soil outside of the excavation are delineated to the south, west and east. Delineation to the north and northeast incomplete. The northeast area is blocked by above-ground infrastructure. Hydrocarbon impacts in the excavated area were delineated to the south, west, east and northwest. Impacts to the northeast remained. Outside of the excavation area, hydrocarbon impacts are delineated to the south. Delineation to the west, east and north is incomplete but complicated by natural seepage.
Vertical Delineation:	Salinity impacts within the excavation were not delineated vertically and impacts remained at the base which is at the bedrock interface. Vertical delineation of salinty impacts inside and outside of the excavation is incomplete past 6.0 mbgs. Delineation is complicated by natural salinity of the upper bedrock. Hydrocarbons were vertically delineated in the excavation and appear to be vertically delineated in general around 4.5 mbgs.

b. Groundwater

Potential Contaminants of Concern:	Hydrocarbons, chloride, metals, PAHs
Proven Contaminants of Concern:	Hydrocarbons, chloride - partially attributed to natural crude and saline water seepage. Background chloride concentration in upper bedrock groundwater is on the order of 300 mg/L.

Presence of Free Product:	Encountered historically at BT3 93-25-X and BT3 99-22-26, between the Former Flare Pit and Bosworth Creek; these locations are not actively monitored at present. This hydrocarbon is attributed to natural seepage.
Lateral Delineation:	Chloride exceedances in the first and second groundwater bearing zones are not delineated to the west, south and southwest. North and east are up-gradient of associated impacts. Note that only chloride values above approx. 300 mg/L in bedrock would be considered related to the former flare pit.
Vertical Delineation:	Groundwater chloride and hydrocarbon impacts are not vertically delineated below the second groundwater bearing zone. The third groundwater bearing zone has limited local monitoring wells due to natural seepage of crude oil and saline water at this depth and below. Note that only chloride values above approx. 300 mg/L in bedrock would be considered related to the former flare pit.

Migration Pathways and Receptors

MIGRATION PATHWAYS	Summarized in Figures 8 and 9. Potential pathways include leaching from soil to groundwater, lateral migration in groundwater, discharge to surface water, shallow vapour migration in soil, water and wind erosion.
RECEPTORS	Summarized in Figures 8 and 9. Main receptor of interest is Bosworth Creek, in relation to human, wildlife and freshwater aquatic life receptors. Secondary receptor of interest is the wetland to the South of the site. Plants and soil invertebrates may also be receptors in the rooting zone of shallow soils.
EXPOSURE PATHWAYS	Summarized in Figures 8 and 9.

Synopsis of Conceptual Risk

In terms of soil related exposure pathways, the remedial excavations completed to date on the former flare pit removed readily accessible PHC and salinity impacted soils. Other impacted soils/bedrock remain in place, along with elevated PHC's and salinity related to natural seepage in the bedrock. Due to physical obstacles to further excavation including the active utilities and bedrock, some residual soil impacts exceeding guidelines remain in place. Risks related to potential exposure pathways for human, ecological, microbial and wildlife contact or ingestion have been reduced, but not eliminated.

The pathway for leaching from soil to groundwater is active. However, measured light-end PHC values, particularly benzene, toluene and ethylbenzene (BTE) in groundwater west of the former flare pit at the inferred discharge point to Bosworth Creek (BOS-DP-13-2-1.35) do not exceed applied CCME fresh water aquatic guidelines. Chloride values at this sentinel location have varied from 320 to 650 mg/L between 2013 and 2017, indicating values that exceed the applied CCME fresh water aquatic guideline (120 mg/L) and the inferred natural background of about 300 mg/L in upper bedrock.

In terms of groundwater related exposure pathways, Figure 7A indicates that chloride exceeding applied guidelines and natural background persist under the footprint of the former flare pit in the upper bedrock water-bearing zone. As such the exposure scenarios related to wildlife watering and freshwater aquatic life at Bosworth Creek are complete and active. In terms of groundwater consumption, the exposure scenario is incomplete for humans. Human drinking water is sourced locally from the Mackenzie River upstream of this site, and is treated by the Town of Norman Wells before use.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

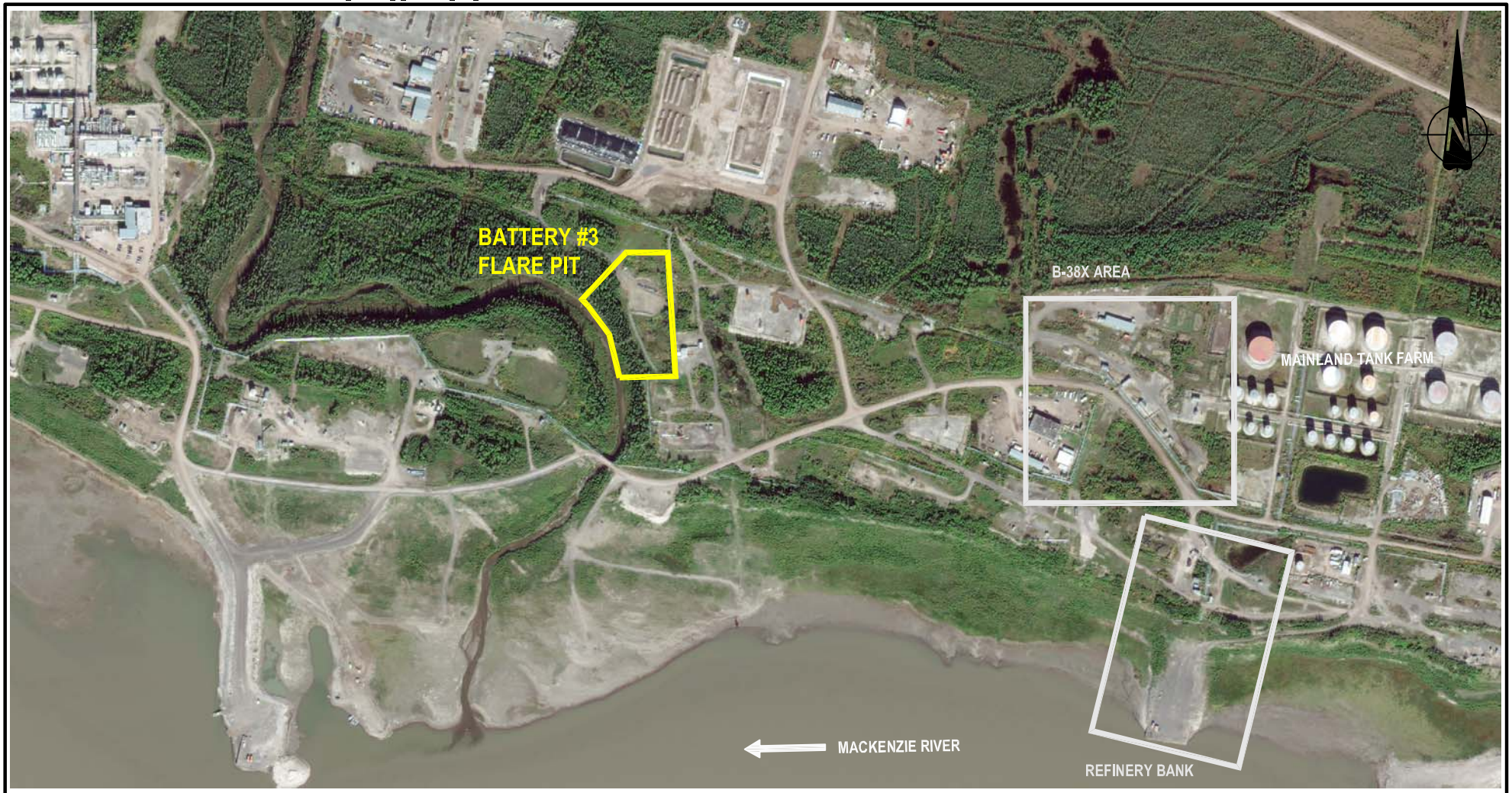
If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 400 m

1:8000

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	30-APR-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

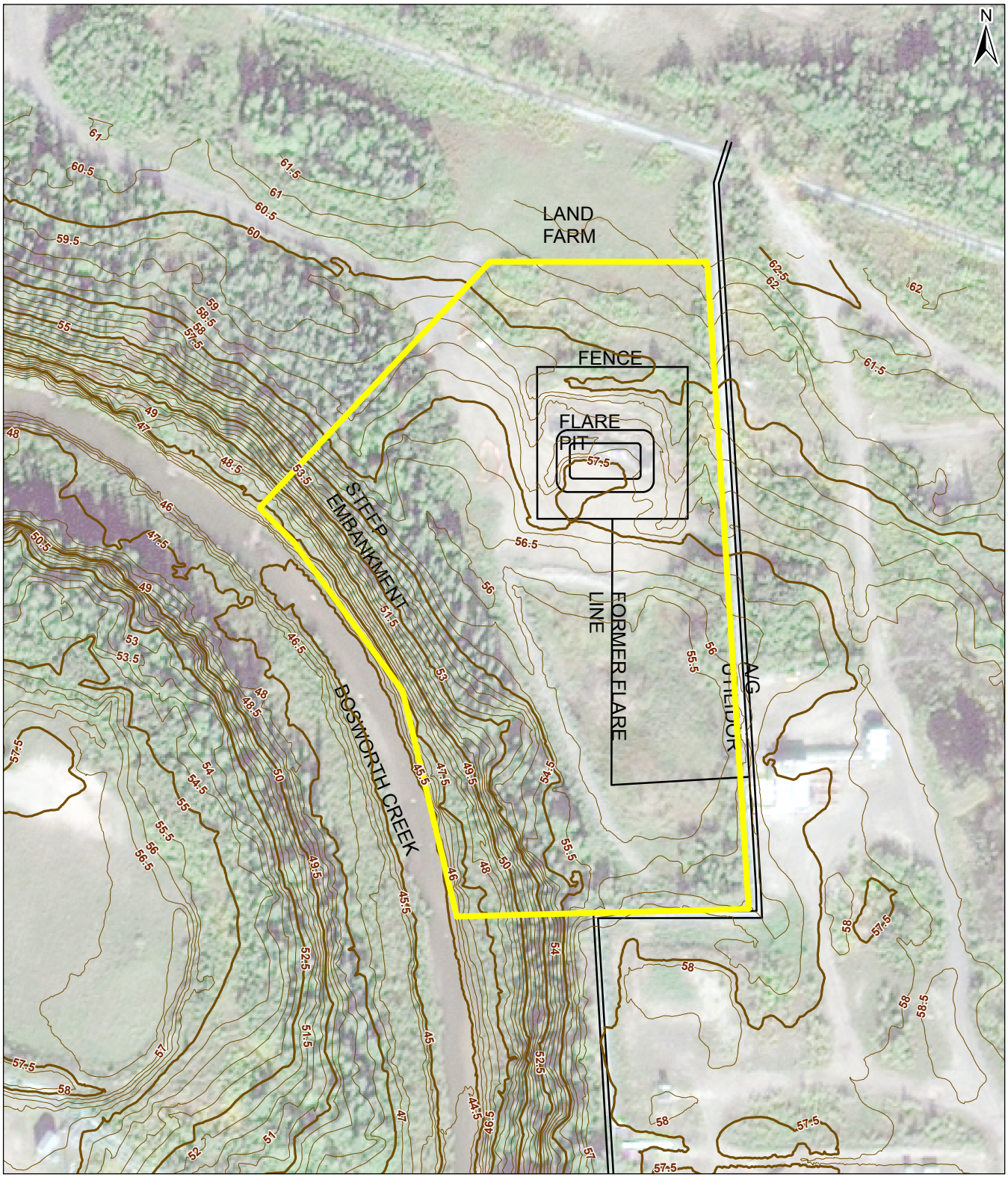
FIG No: 1

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 9:58:56 AM USER NAME: blair.fink
SAVE DATE & TIME: 17/5/2018 3:04:40 PM ISSUING OFFICE: eCAD





Site Boundary

Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 25 50
Metres

1:1,500

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	30-MAY-18	Drawn by:	T.G.	Edited by:	T.G.	App'd by:	D.G.

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 3

REV 0

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:42:59 PM
USER NAME: Tom.Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\BT3\BT3_Topography_Rev0.mxd

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-MAINLANDCENTRAL.DWG

PLOT DATE & TIME: 18/5/2018 9:06:18 AM
SAVE DATE & TIME: 17/5/2018 4:57:38 PM
USER NAME: Blair.Rink
ISSUING OFFICE: eCAD



LEGEND

- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)
- 2016 EXCAVATION BOUNDARY

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 25 50 75 m

1:1250

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

SITE PLAN SHOWING SAMPLING LOCATIONS

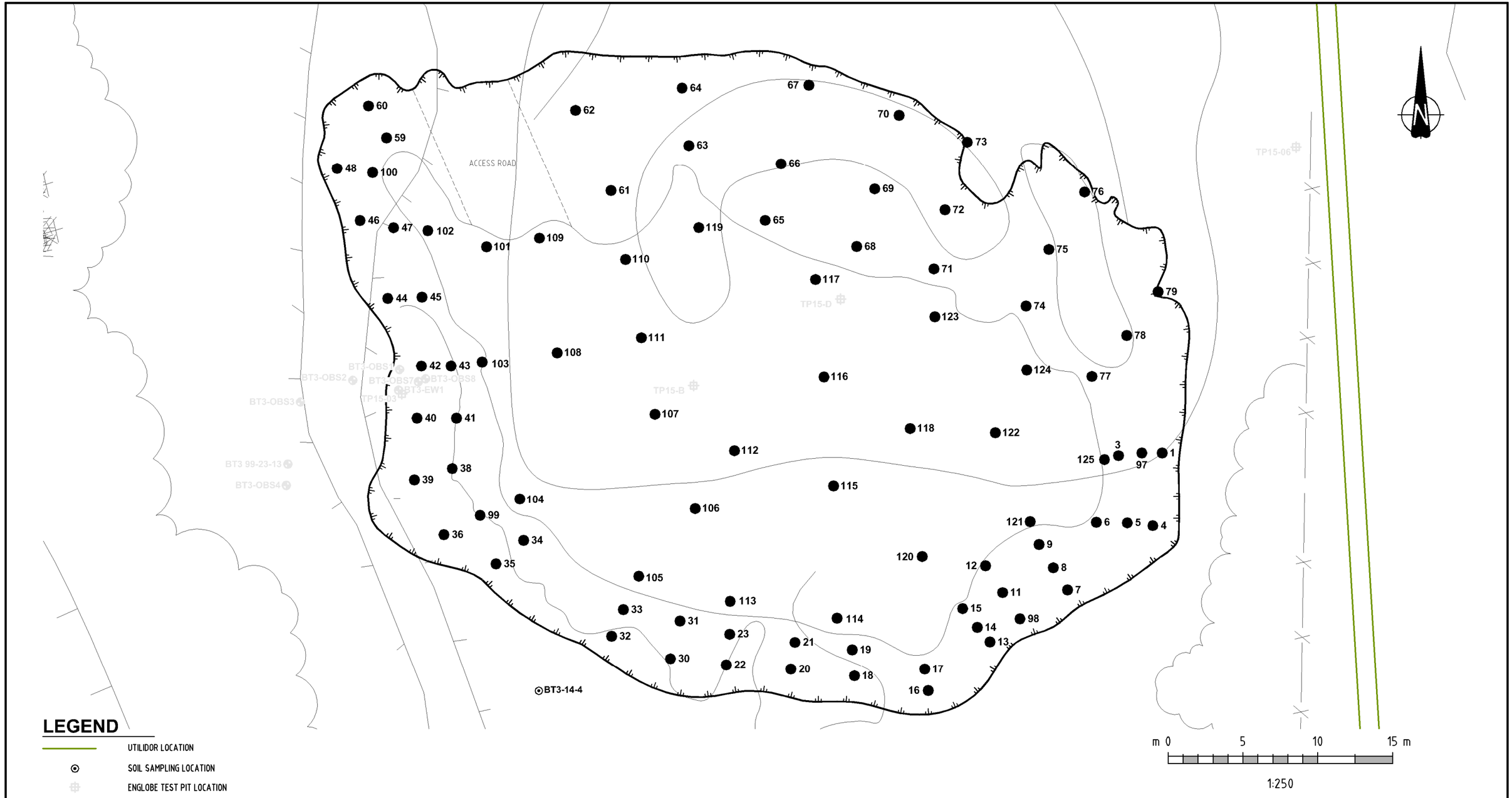
Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No: 4A
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."



LEGEND

- UTILIDOR LOCATION
- SOIL SAMPLING LOCATION
- ENGLOBE TEST PIT LOCATION
- MONITORING WELL LOCATION
- PERIMETER OF EXCAVATION
- EXCAVATION BASE (APPROXIMATE)
- EXCAVATION SOIL SAMPLE (BT3-16-XX)

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

EXCAVATION SITE PLAN SHOWING SAMPLING LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
16-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

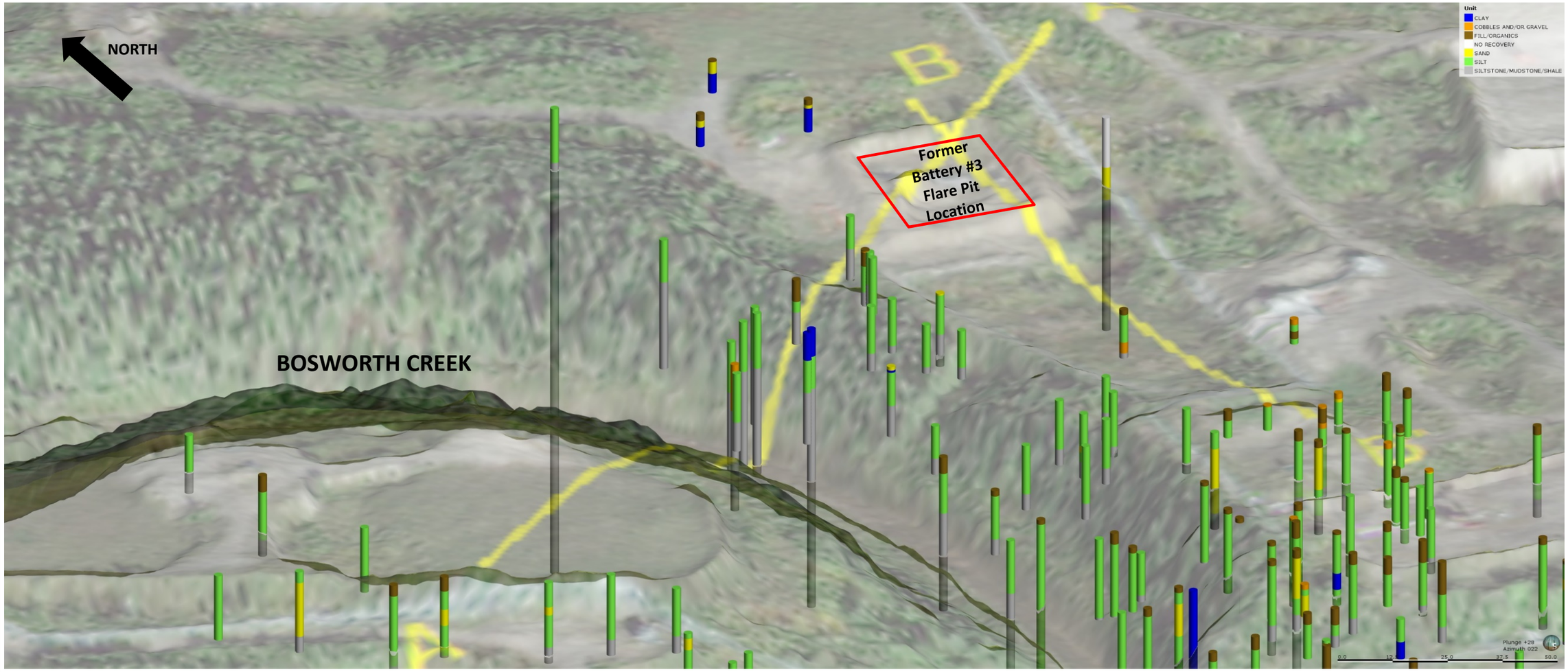
WorleyParsons Project No. 407011-00622-400

FIG No 4B | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 17/5/2018 4:27:30 PM
SAVE DATE & TIME: 16/5/2018 4:37:17 PM
USER NAME: blair.fink
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BT3_EXCAVATION.DWG



IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION

OneWay™ to zero harm

Advisian
WorleyParsons Group

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	LG	MB

WorleyParsons Project No.
407011-00622

FIG No. 5A

REV B

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALG\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BT3

A

A'

BT00-11

BT99-41

Bosworth Creek

BT3-OBS4
BT3 99-23-13
BT3-OBS3
BT3-OBS2
BT3-EW1
BT3-OBS1
BT3 99-22-26
BT3-OBS5
BT99-34

Approximate
Extent of
Former Flare Pit

BT97-15
BT99-36
BT99-35

30 m

Shallow Bedrock
Water Table
(Approximate)

Bedrock Surface



Site Plan Showing Cross-Section Locations

Plunge 00
Azimuth 345

0 10 20 30

Note: 3x Vertical Exaggeration
Transept Width: ~30m

LOCATION WHERE SALINITY PARAMETERS MET GUIDELINES, SHOWN IN GREEN

LOCATION WHERE SALINITY PARAMETERS EXCEEDED GUIDELINES, SHOWN IN RED

Unit
- CLAY
- COBBLES AND/OR GRAVEL
- FILL/ORGANICS
- NO RECOVERY
- SAND
- SILT
- SILTSTONE/MUDSTONE/SHALE

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

CROSS-SECTION A-A' (SOUTHWEST TO NORTHEAST)

Date: 18-May-18	Drawn by: AM	Edited by: LG	App'd by: MB

OneWay to zero harm

Advision
WorleyParsons Group

WorleyParsons Project No. 407011-00622

FIG No. 5B

REV B

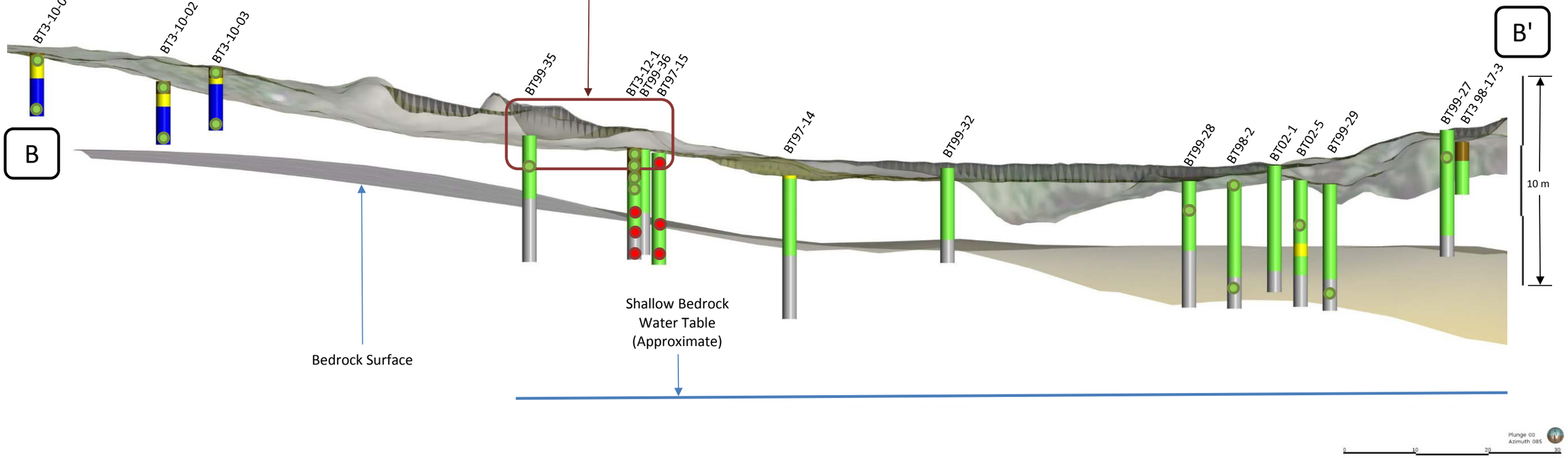
" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BT3



Site Plan Showing Cross-Section Locations



Unit

- CLAY
- COBBLES AND/OR GRAVEL
- FILL/ORGANICS
- NO RECOVERY
- SAND
- SILT
- SILTSTONE/MUDSTONE/SHALE

LOCATION WHERE SALINITY PARAMETERS MET GUIDELINES, SHOWN IN GREEN

LOCATION WHERE SALINITY PARAMETERS EXCEEDED GUIDELINES, SHOWN IN RED

Note: 3x Vertical Exaggeration
Transect Width: ~30m

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

CROSS-SECTION B-B' (NORTH TO SOUTH)

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	LG	MB

OneWay to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622

FIG No.
5C

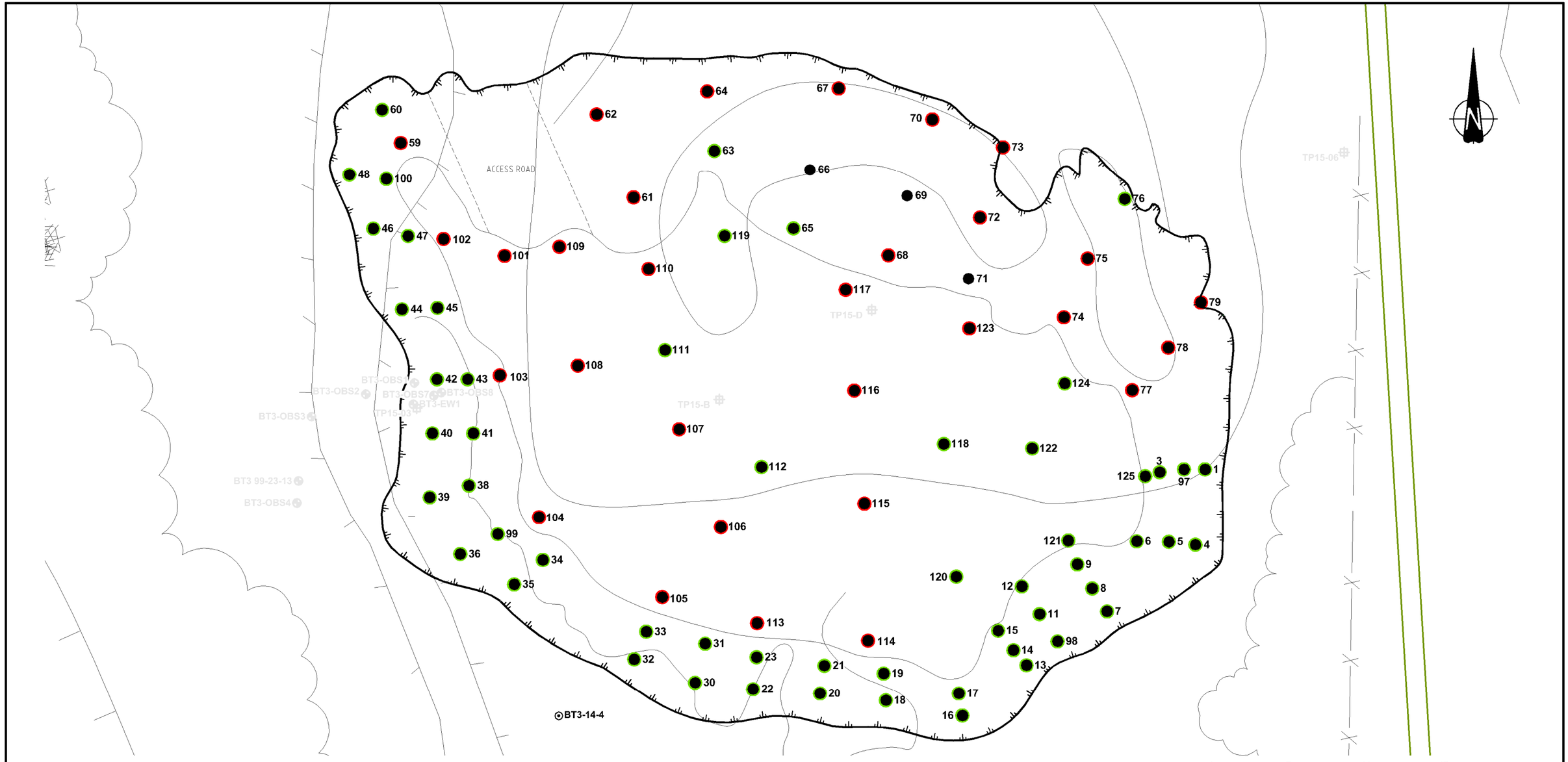
REV
B

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BT3





LEGEND

- UTILIDOR LOCATION
- SOIL SAMPLING LOCATION
- ENGLOBE TEST PIT LOCATION
- MONITORING WELL LOCATION
- PERIMETER OF EXCAVATION
- EXCAVATION BASE (APPROXIMATE)
- EXCAVATION SOIL SAMPLE (BT3-16-XX)

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL SALINITY PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE SALINITY PARAMETER THAT WAS ANALYZED, SHOWN IN RED

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

EXCAVATION SOIL ANALYTICAL RESULTS: SALINITY PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
18-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

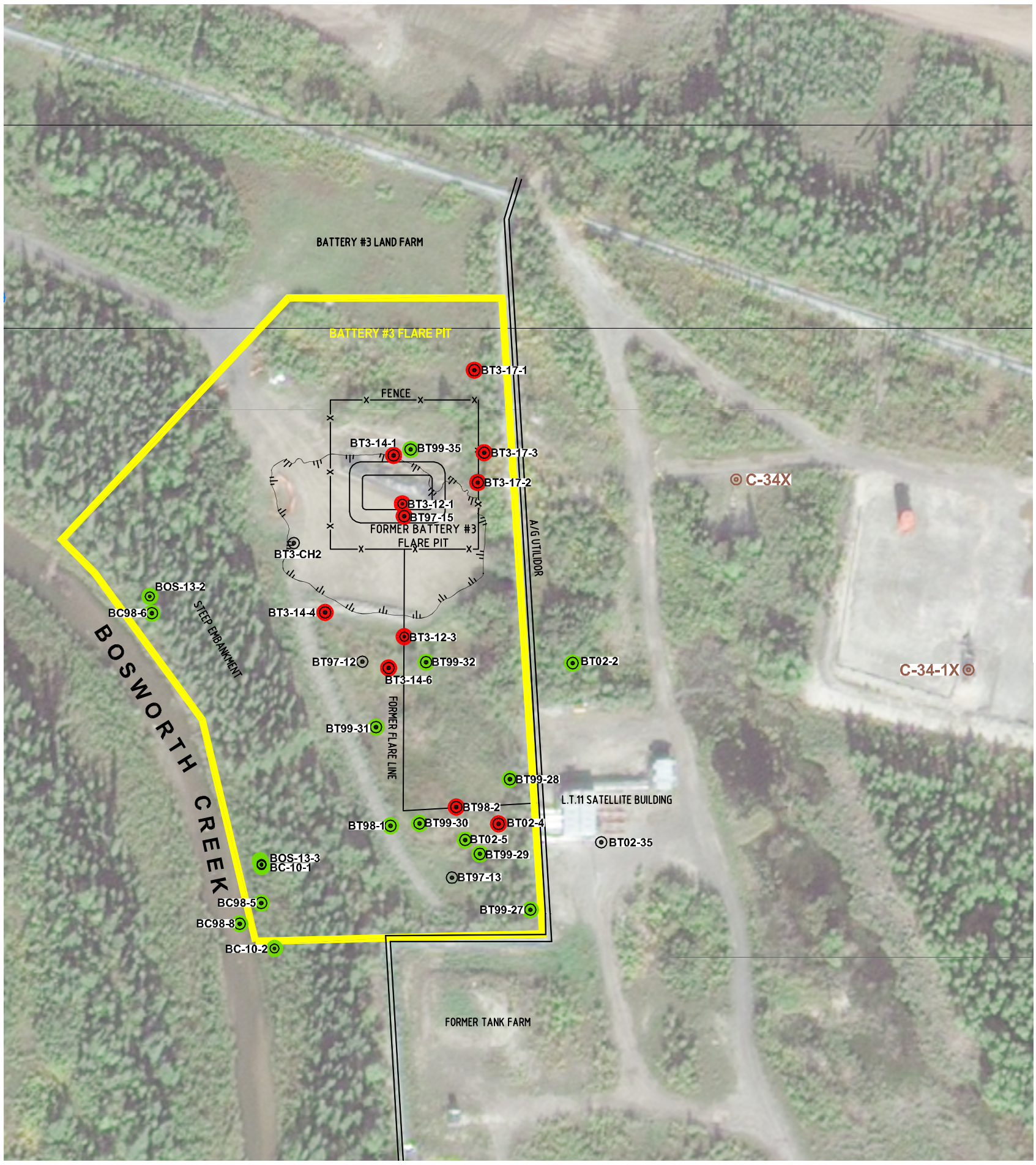
FIG No 6B | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 12:10:11 PM USER NAME: blair.fink
SAVE DATE & TIME: 18/5/2018 12:03:37 PM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BT3_EXCAVATION.DWG

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-MAINLANDCENTRAL.DWG
PLOT DATE & TIME: 18/5/2018 9:27:08 AM
SAVE DATE & TIME: 18/5/2018 9:22:24 AM
USER NAME: Blair.Rink
ISSUING OFFICE: eCAD



LEGEND

- PRODUCTION WELL LOCATION
- SOIL SAMPLING LOCATION (APPROXIMATE)
- 2016 EXCAVATION BOUNDARY

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2017.
3. AIR PHOTO VIA PLANET LABS GEOMATICS CORP., DATE: APRIL 6 AND 30, 2017

m 0 25 50 75 m

1:1250

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS:
ORGANIC PARAMETERS

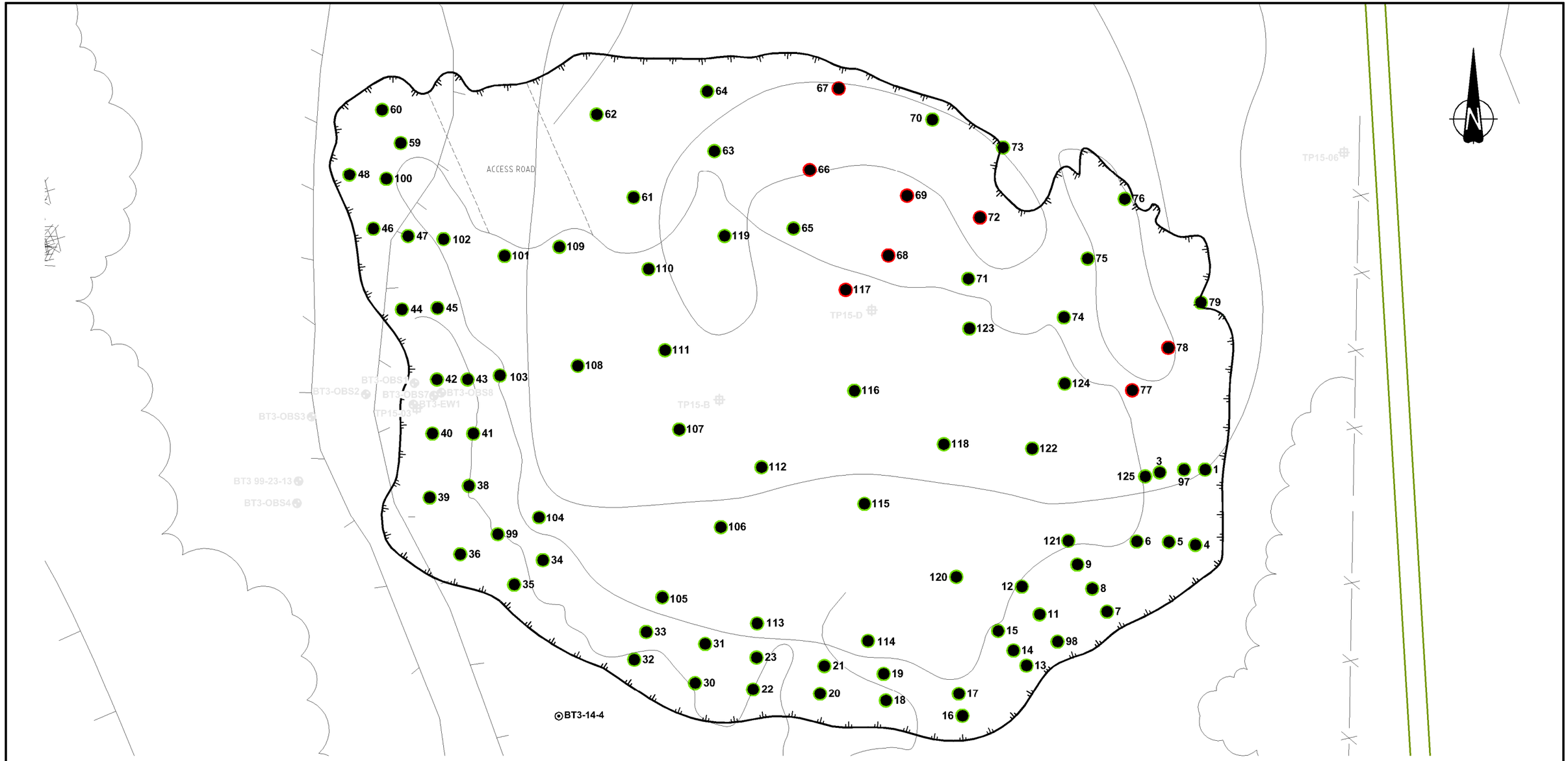
Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

FIG No 6C | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."



LEGEND

- UTILIDOR LOCATION
- SOIL SAMPLING LOCATION
- ENGLOBE TEST PIT LOCATION
- MONITORING WELL LOCATION
- PERIMETER OF EXCAVATION
- EXCAVATION BASE (APPROXIMATE)
- EXCAVATION SOIL SAMPLE (BT3-16-XX)

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

EXCAVATION SOIL ANALYTICAL RESULTS: ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
18-MAY-18	OTHERS	B.M.F.	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

FIG No 6D | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 12:13:43 PM USER NAME: blair.fink
SAVE DATE & TIME: 18/5/2018 12:03:37 PM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BT3_EXCAVATION.DWG

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-MAINLANDCENTRAL.DWG
PLOT DATE & TIME: 18/5/2018 9:29:07 AM
SAVE DATE & TIME: 18/5/2018 9:22:24 AM
USER NAME: Blair.Rink
ISSUING OFFICE: eCAD



LEGEND

- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- 2016 EXCAVATION BOUNDARY

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET DISSOLVED CHLORIDE GUIDELINE IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED DISSOLVED CHLORIDE GUIDELINE IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- DISSOLVED CHLORIDE DATA NOT AVAILABLE

m 0 25 50 75 m

1:1250

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: DISSOLVED CHLORIDE

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

FIG No 7A | REV C

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-MAINLANDCENTRAL.DWG
PLOT DATE & TIME: 18/5/2018 9:30:48 AM
SAVE DATE & TIME: 18/5/2018 9:22:24 AM
USER NAME: Blair.Rink
ISSUING OFFICE: eCAD



LEGEND

- PRODUCTION WELL LOCATION
- MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- 2016 EXCAVATION BOUNDARY

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PETROLEUM HYDROCARBON PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PETROLEUM HYDROCARBON PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- PETROLEUM HYDROCARBON DATA NOT AVAILABLE

m 0 25 50 75 m

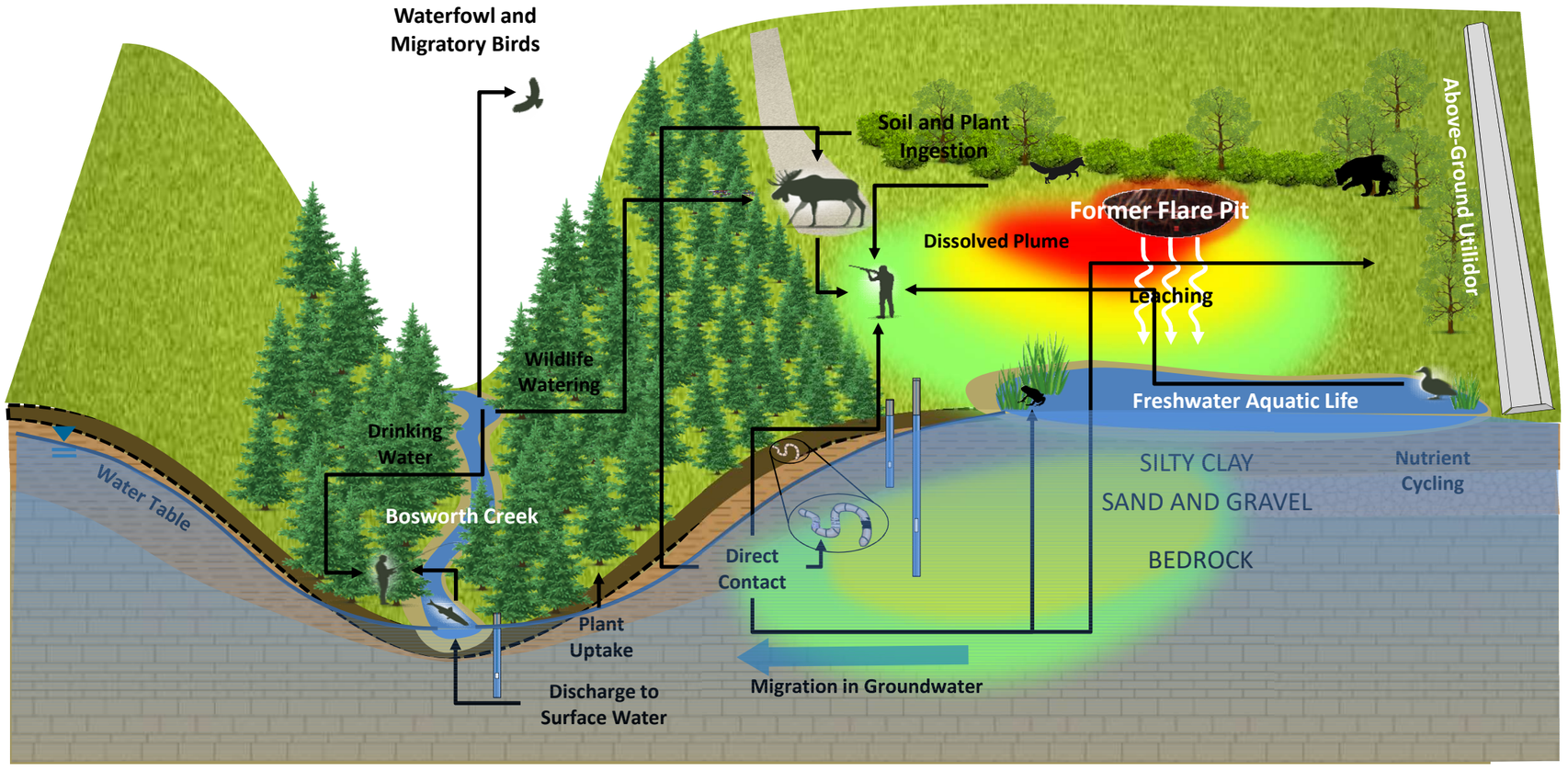
1:1250

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: PETROLEUM HYDROCARBON PARAMETERS

Date: 11-MAY-18	Drawn by: OTHERS	Edited by: BMF	App'd by:
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-400	
		FIG No 7B	REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."



CONCEPTUAL SITE MODEL

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AH	LG	

OneWay™ to zero harm

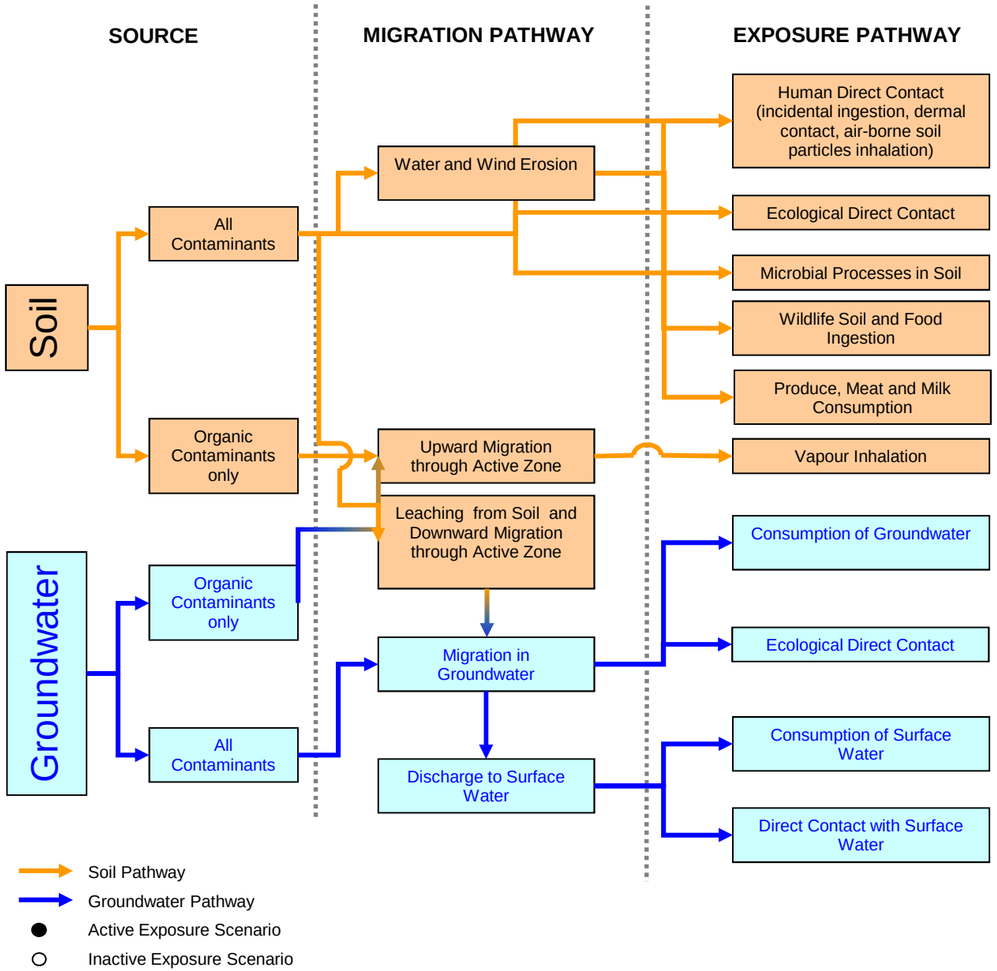
Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622

FIG No.: 8

REV: A

Battery #3 Flare Pit - Conceptual Exposure Model Flow Chart (Current Land Use and Site Conditions)



RECEPTORS			
Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
●			
		●	
		●	
	●		
●[1]			
○			
○	●		
			●

Notes: 1) Although the current land use is industrial, it is recognized that due the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site and that hunters are able hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
BATTERY #3 FLARE PIT, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

OneWay™ to zero harm

Date: 16-May-18 | Drawn by: AH | Edited by: LG | App'd by: MB

Advision
WorleyParsons Group

WorleyParsons Project No.
407011-00622

FIG No. 9 | REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BT3

Tables



Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
BATTERY #3 FLARE PIT																									
BC-10-1	02-Sep-2010	0.0 - 0.3m	3.2	1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BC-10-2	02-Sep-2010	0.0 - 0.3m	2.2	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BC98-5	06-Sep-1998	0.0 - 0.2m	---	---	---	---	8.7	239	0.7	< 0.2	18	< 0.25	12.3	18.1	14	< 0.05	0.4	31	0.4	---	< 0.5	---	---	21.2	97.2
BC98-6	06-Sep-1998	0.0 - 0.2m	---	---	---	---	8.6	240	0.8	< 0.2	17.8	< 0.25	12	18.2	15	< 0.05	< 0.4	30.4	0.4	---	< 0.5	---	---	20.7	94.7
BC98-8	06-Sep-1998	0.0 - 0.2m	---	---	---	---	7.3	258	0.8	< 0.2	17.9	< 0.25	12.6	18.8	14	< 0.05	0.6	31.3	0.3	---	< 0.5	---	---	20.4	94
BT02-2	21-Jul-2002	0.0 - 1.5m	---	---	---	---	8.8	227	0.5	0.58	15.2	< 0.25	11.1	26.5	10.8	< 0.05	1.8	35.5	0.8	---	0.19	---	---	27	111
	21-Jul-2002	3.0 - 4.5m	0.542	1.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT02-4	21-Jul-2002	0.0 - 1.5m	---	---	---	---	8.4	272	0.5	0.63	15.7	< 0.25	12.3	24.8	11.7	< 0.05	2.7	36.5	0.5	---	0.19	---	---	27	110
	21-Jul-2002	3.0 - 4.5m	0.981	1.24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT02-5	21-Jul-2002	0.0 - 1.5m	---	---	---	---	8.7	295	0.5	0.55	15.5	< 0.25	10.9	25.3	11.4	< 0.05	1.9	32.7	0.5	---	0.17	---	---	25	107
	21-Jul-2002	1.5 - 3.0m	0.726	1.30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-12-1	13-Jul-2012	0.0 - 0.5m	1.8	0.97	6.87	1.3	**19** [#1]	960	0.76	0.30	79	< 0.15	9.8	25	43	< 0.050	12	57	0.87	< 1.0	0.42	3.5	2.5	86	170
	13-Jul-2012	0.5 - 1.0m	3.7	5.6	7.54	< 1.0	**41** [#1]	340	0.41	0.24	17	< 0.15	8.1	16	17	< 0.050	1.4	29	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	40	91
	13-Jul-2012	1.0 - 1.5m	0.69	7.5	7.53	< 1.0	**14** [#1]	460	0.56	0.86	20	< 0.15	9.6	14	84	< 0.050	2.1	32	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	39	190
	13-Jul-2012	1.5 - 2.0m	1.0	12 [#1]	7.34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	2.5 - 3.0m	1.1	**17** [#1]	7.28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	3.4 - 3.9m	1.5	**18** [#2]	7.56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	4.5 - 5.3m	1.9	**20** [#2]	7.73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-12-3	14-Jul-2012	0.0 - 0.4m	0.63	0.40	7.00	< 1.0	9.5	330	0.69	0.60	22	< 0.15	10	24	22	< 0.050	2.2	33	0.94	< 1.0	< 0.30	< 1.0	2.0	39	97
	14-Jul-2012	0.4 - 0.9m	0.66	0.50	7.01	< 1.0	11	300	0.69	0.66	21	< 0.15	11	25	11	< 0.050	2.4	34	0.95	< 1.0	< 0.30	< 1.0	1.1	36	100
	14-Jul-2012	1.4 - 1.8m	0.53	0.40	6.99	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2012	1.8 - 2.5m	0.61	0.43	7.35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2012	3.0 - 4.0m	0.84	1.4	7.27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
BT3-14-1	04-Mar-2014	1.0m	**35 [#1]**	**41 [#1]**	7.83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	2.0m	**68 [#1]**	**47 [#1]**	7.51	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	3.0m	**36 [#1]**	**65 [#1]**	7.62	< 1.0	4.3	130	0.44	1.3	14	< 0.15	7.5	17	39	< 0.050	1.4	23	< 0.50	< 1.0	0.56	< 1.0	< 1.0	25	140
	04-Mar-2014	4.0m	**18 [#2]**	**19 [#2]**	7.27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	5.0m	**13 [#2]**	**14 [#2]**	7.42	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	6.0m	**7.9 [#2]**	**22 [#2]**	7.68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-14-4	04-Mar-2014	1.0m	2.5	6.9	7.17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	2.0m	2.4	4.9	7.16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	3.0m	1.8	3.5	7.04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	4.0m	3.4	4.3	7.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	5.0m	2.1	4.0	7.20	< 1.0	11	250	0.50	0.22	21	< 0.15	11	17	8.5	< 0.050	0.74	32	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	31	84
	04-Mar-2014	5.5m	1.3	2.6	7.42	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-14-6	03-Mar-2014	1.0m	0.46	1.4	7.31	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	2.0m	0.55	0.98	7.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	3.0m	0.63	1.5	7.11	< 1.0	8.9	310	0.54	0.49	18	< 0.15	9.8	22	10	0.080	2.0	30	0.70	< 1.0	< 0.30	< 1.0	< 1.0	27	89
	03-Mar-2014	4.0m	0.44	2.4	7.38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	4.5m	0.53	2.9	7.55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-01	26-Jun-2016	1.0	3.3	3.2	7.19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-03	26-Jun-2016	3.0	1.7	1.8	7.35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-04	26-Jun-2016	1.0	1.9	1.5	7.36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-05	26-Jun-2016	2.0	2.3	1.7	7.29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-06	26-Jun-2016	3.0	1.4	0.96	7.27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-07	26-Jun-2016	1.0	1.9	1.1	7.27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-08	26-Jun-2016	2.0	1.4	1.5	7.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-09	26-Jun-2016	3.0	1.9	1.9	7.29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-11	26-Jun-2016	2.0	2.1	3.5	7.07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
BT3-16-12	26-Jun-2016	3.0	1.9	3.8	7.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-13	26-Jun-2016	1.0	2.2	6.6	7.44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-14	26-Jun-2016	2.0	2.4	5.4	7.29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-15	26-Jun-2016	3.0	2.1	4.9	7.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-16	27-Jun-2016	1.0	0.95	3.2	7.24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-17	27-Jun-2016	2.0	0.75	1.1	6.84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-18	27-Jun-2016	1.0	0.84	2	7.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-19	27-Jun-2016	2.0	0.82	1.2	6.96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-20	27-Jun-2016	1.0	2.7	6.3	7.19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-21	27-Jun-2016	2.0	2.3	5.8	7.15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-22	28-Jun-2016	1.0	1.4	6.6	7.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-23	28-Jun-2016	2.0	1.4	4	7.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-30	06-Jul-2016	1.0	2.5	6.4	6.97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-31	06-Jul-2016	2.0	2.3	5.4	7.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-32	06-Jul-2016	1.0	3.3	7.6	7.22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-33	06-Jul-2016	2.0	1.5	4.8	7.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-34	06-Jul-2016	1.0	1.8	4.3	7.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-35	06-Jul-2016	2.0	3.9	4.3	7.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-36	06-Jul-2016	1.0	2.7	4.3	7.22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-38	07-Jul-2016	2.0	1.8	2.3	7.04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-39	07-Jul-2016	1.0	3.6	2.2	7.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-40	07-Jul-2016	1.0	1.1	1.5	7.04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
BT3-16-41	07-Jul-2016	2.0	2.7	2.2	7.29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-42	07-Jul-2016	1.0	3	2.5	6.56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-43	07-Jul-2016	2.0	2.2	1.9	7.32	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-44	07-Jul-2016	1.0	4	3.7	6.83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-45	07-Jul-2016	2.0	1.4	1.1	6.99	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-46	07-Jul-2016	1.0	2.1	2.9	6.73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-47	07-Jul-2016	2.0	1.4	5.6	6.87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-48	07-Jul-2016	1.0	1.6	4.7	7.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-60	07-Jul-2016	1.0	4	8.9	7.51	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-63	08-Jul-2016	2.5	1.4	2.4	7.63	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-71	08-Jul-2016	3.0	3.1	6.7	7.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-77	08-Jul-2016	3.0	**4.2** [#1]	**15** [#1]	7.45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-78	08-Jul-2016	2.0	**17** [#1]	**18** [#1]	7.21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-79	08-Jul-2016	1.0	**17** [#1]	5.3	7.07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-97	22-Jul-2016	2.0	1.6	2.3	7.44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-98	22-Jul-2016	1.0	0.98	1.1	7.28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-99	22-Jul-2016	2.0	2.6	2	7.26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-100	22-Jul-2016	2.0	3.4	12	7.43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-101	24-Jul-2016	4.5	**23** [#2]	12	7.35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-102	24-Jul-2016	4.5	**5.5** [#2]	12	7.41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-103	24-Jul-2016	4.5	**30** [#2]	**22** [#2]	7.36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-104	24-Jul-2016	4.5	**10** [#2]	7.5	7.37	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
BT3-16-105	24-Jul-2016	4.5	**5.8** [#2]	3.5	7.26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-106	24-Jul-2016	4.5	**16** [#2]	**18** [#2]	7.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-107	24-Jul-2016	4.5	**15** [#2]	6.2	7.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-108	24-Jul-2016	4.5	**4.4** [#2]	4	7.38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-109	24-Jul-2016	4.5	**18** [#2]	10	7.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-110	24-Jul-2016	4.5	**25** [#2]	**17** [#2]	7.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-111	24-Jul-2016	4.5	3.6	3.9	7.33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-112	25-Jul-2016	4.5	2	2.1	7.38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-113	25-Jul-2016	4.5	**7.1** [#2]	3.4	7.37	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-114	25-Jul-2016	4.5	**6.7** [#2]	3.6	7.34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-115	25-Jul-2016	4.5	**8.6** [#2]	5.7	7.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-116	25-Jul-2016	4.5	**4.1** [#2]	3.8	7.16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-117	25-Jul-2016	4.5	3.3	**22** [#2]	7.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-118	25-Jul-2016	4.5	3.3	3.1	7.27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-119	25-Jul-2016	4.5	1.7	6.2	7.61	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-120	25-Jul-2016	4.5	1.2	0.53	7.27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-121	25-Jul-2016	4.5	0.8	0.59	7.28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-122	25-Jul-2016	4.5	2.1	1.2	7.29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-123	25-Jul-2016	4.5	**5.9** [#2]	5.4	**4.97** [#2]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-124	25-Jul-2016	4.5	1.7	2	7.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-125	25-Jul-2016	4.5	1.2	0.62	7.33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-59	07-Jul-2016	2.0	**7.5** [#1]	**13** [#1]	7.36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
BT3-16-61	08-Jul-2016	2.5	**14** [#1]	**16** [#1]	7.46	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-62	08-Jul-2016	1.0	**9.9** [#1]	**13** [#1]	7.39	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-64	08-Jul-2016	1.0	**36** [#1]	**49** [#1]	7.43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-65	08-Jul-2016	3.0	0.94	4.2	7.78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-66	08-Jul-2016	2.0	1.5	3	7.45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-67	08-Jul-2016	1.0	**100** [#1]	**52** [#1]	6.78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-68	08-Jul-2016	3.0	**4.3** [#1]	3.1	7.71	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-69	08-Jul-2016	2.0	3.6	4.2	7.66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-70	08-Jul-2016	1.0	**24** [#1]	**28** [#1]	7.52	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-72	08-Jul-2016	2.0	2.3	**14** [#1]	7.31	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-73	08-Jul-2016	1.0	**> 110** [#1]	**59** [#1]	7.34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-74	08-Jul-2016	3.0	**6.7** [#1]	**33** [#1]	7.54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-75	08-Jul-2016	2.0	2	**25** [#1]	7.68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-76	08-Jul-2016	1.0	0.72	3	7.33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-17-1	22-Sep-2017	0.5 - 1.0m	0.27	0.78	7.60	0.59	9.9	340	0.54	0.50	19	< 0.080	10	23	11	---	2.1	31	0.67	< 0.20	0.16	< 1.0	0.86	29	95
	22-Sep-2017	2.0 - 2.5m	0.37	0.48	7.58	0.62	10	310	0.48	0.55	17	< 0.080	10	22	10	---	2.1	30	< 0.50	< 0.20	0.18	< 1.0	0.88	26	96
	22-Sep-2017	4.0 - 4.5m	1.8	0.20	7.52	< 0.50	11	180	0.43	0.41	17	< 0.080	10	20	9.3	---	1.6	30	< 0.50	< 0.20	0.14	< 1.0	0.82	26	90
BT3-17-2	22-Sep-2017	0.5 - 1.0m	**8.7** [#1]	2.0	7.28	0.58	9.0	480	0.58	0.62	15	< 0.080	7.5	16	10	---	0.93	26	0.82	< 0.20	< 0.10	< 1.0	1.4	31	76
	22-Sep-2017	1.5 - 2.0m	1.8	8.4	7.71	0.52	11	270	0.49	0.41	20	< 0.080	9.8	20	9.9	---	1.7	31	< 0.50	< 0.20	0.16	< 1.0	0.81	29	89
BT3-17-3	22-Sep-2017	0.5 - 1.0m	3.6	3.7	7.49	0.52	8.7	300	0.51	0.32	17	< 0.080	8.4	21	9.2	---	1.4	29	0.57	< 0.20	0.12	< 1.0	0.80	27	72
(Duplicate)	22-Sep-2017	0.5 - 1.0m	3.4	3.3	7.34	0.54	8.2	280	0.48	0.30	18	< 0.080	8.1	21	8.9	---	1.5	28	0.50	< 0.20	0.13	< 1.0	0.75	27	75
	22-Sep-2017	1.5 - 2.0m	0.39	0.43	7.59	< 0.50	9.7	270	0.41	0.45	17	< 0.080	9.5	21	9.9	---	1.9	29	< 0.50	< 0.20	0.16	< 1.0	0.91	26	89
	22-Sep-2017	3.0 - 3.5m	2.5	0.16	7.42	0.56	8.5	140	0.43	0.47	17	< 0.080	10	21	9.3	---	1.7	29	0.50	< 0.20	< 2 [#1]	< 1.0	0.87	26	92
BT97-12	26-Jul-1997	0.0 - 0.8m	**5.6** [#1]	5.9	---	---	9.3	294	0.7	0.2	17.3	< 0.25	9.4	20.5	13	0.06	2.4	28.1	0.9	---	< 2 [#1]	---	---	29.3	90.1
BT97-13	29-Jul-1997	0.0 - 0.8m	0.565	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
BT97-15	26-Jul-1997	0.0 - 0.8m	**14.7** [#1]	**13.8** [#1]	---	---	**23.9** [#1]	959	0.9	3.3	23.9	< 0.25	10.3	15.3	17	< 0.05	< 0.4	35.7	0.6	---	**< 2** [#1]	---	---	49.8	98.4
	26-Jul-1997	2.3 - 3.8m	**18.5** [#1,2]	**13.0** [#1,2]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Jul-1997	3.8 - 5.3m	**36.9** [#2]	**12.4** [#2]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT98-1	02-Sep-1998	4.5 - 6.0m	0.661	2.82	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT98-2	02-Sep-1998	0.0 - 0.3m	0.51	1.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Sep-1998	4.5 - 6.0m	0.607	4.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-27	17-Jun-1999	1.0 - 1.5m	0.581	1.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-28	17-Jun-1999	1.0 - 1.5m	0.616	1.77	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-29	17-Jun-1999	0.0 - 0.15m	---	---	---	---	**13** [#1]	260	0.6	0.2	16.6	0.52	10.1	25.0	12	0.06	2.1	32.5	0.9	---	0.3	---	---	29.5	106
	17-Jun-1999	4.5 - 6.0m	0.327	3.80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-30	17-Jun-1999	0.0 - 0.15m	---	---	---	---	**16** [#1]	301	0.6	0.2	13.9	< 0.25	8.5	24.9	12	0.10	27.7	31.6	2.1	---	**1.8** [#1]	---	---	53.4	89.6
	17-Jun-1999	3.0 - 4.5m	1.16	1.33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-31	18-Jun-1999	0.0 - 0.15m	---	---	---	---	**13** [#1]	343	0.5	0.9	13.4	< 0.25	8.7	22.4	16	0.13	16.4	32.0	1.7	---	**1.5** [#1]	---	---	37.0	107
	18-Jun-1999	3.0 - 4.5m	0.605	0.83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-32	18-Jun-1999	0.0 - 0.15m	---	---	---	---	8.6	319	0.7	0.9	16.1	< 0.25	10.7	25.4	12	< 0.05	1.1	35.0	0.9	---	< 0.2	---	---	28.9	104
	18-Jun-1999	0.15 - 0.3m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-35	18-Jun-1999	1.0 - 1.5m	2.34	6.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BOS-13-2	07-Sep-2013	0.5 - 0.8m	2.0	5.4	6.70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Sep-2013	0.9 - 1.1m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BOS-13-3	08-Sep-2013	0.5 - 0.7m	2.1	11	6.77	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Sep-2013	1.3 - 1.5m	1.6	**13** [#1]	6.73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
CCME Industrial Fine Sub-Surface [#2]			4	12	(6 - 8)	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			110	330	430	230	---	---	---	---	---	0.28	320	32	10	72	5.3	10	180	0.25	10	0.013	0.046	100
CCME Industrial Fine Sub-Surface [#2]			620	660	860	460	---	---	---	---	---	0.28	320	32	10	72	5.3	10	180	0.25	10	0.013	0.046	100
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	320	260	2500	6600	6600	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	800	1000	5000	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---
BATTERY #3 FLARE PIT																									
BC-10-1	02-Sep-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	38	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BC-10-2	02-Sep-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	46	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BC98-5	06-Sep-1998	0.0 - 0.2m	1.4	< 0.04	0.29	10.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BC98-6	06-Sep-1998	0.0 - 0.2m	< 0.04	< 0.04	< 0.04	< 0.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BC98-8	06-Sep-1998	0.0 - 0.2m	< 0.04	< 0.04	< 0.04	< 0.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT02-2	21-Jul-2002	0.0 - 1.5m	< 0.04	< 0.10	< 0.10	< 0.2	< 10	< 50	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Jul-2002	1.5 - 3.0m	< 0.04	< 0.10	< 0.10	< 0.2	< 10	< 50	63	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT02-4	21-Jul-2002	0.0 - 1.5m	3.1	< 0.10	2.2	< 5	260	**6400** [#3]	**10000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Jul-2002	2.1 - 3.0m	16	0.98	9.3	14	**1100** [#3]	**2000** [#3]	**3600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Jul-2002	4.5 - 6.0m	0.49	< 0.10	0.52	< 0.93	150	**1100** [#4]	2700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT02-5	21-Jul-2002	0.0 - 1.5m	< 0.04	< 0.10	< 0.10	< 0.2	16	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Jul-2002	3.0 - 4.5m	< 0.04	< 0.10	< 0.10	< 0.2	19	83	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-12-1	13-Jul-2012	0.0 - 0.5m	0.058	0.23	0.083	0.56	< 12	**4000** [#3]	**30000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	0.5 - 1.0m	2.5	0.079	3.0	25	**730** [#3]	**16000** [#3]	**67000** [#3]	---	---	**0.61** [#1]	< 1.3	0.93	0.60	0.097	0.37	0.15	0.53	**6.6** [#1]	< 0.050	**22** [#1]	**26** [#1]	2.2
	13-Jul-2012	1.0 - 1.5m	22	2.7	46	190	**2200** [#3]	**18000** [#3]	**42000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	1.5 - 2.0m	8.5	2.2	17	64	**1900** [#3]	**11000** [#3]	**29000** [#3]	---	---	**< 0.73** [#1]	< 0.57	0.43	0.22	< 0.050	< 0.10	< 0.050	0.20	**3.0** [#1]	< 0.050	**9.6** [#1]	**8.6** [#1]	0.85
	13-Jul-2012	2.5 - 3.0m	1.7	2.4	2.1	9.7	200	**1800** [#3]	**4700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	3.4 - 3.9m	1.7	3.8	1.2	6.9	160	700	2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2012	4.5 - 5.3m	0.24	0.62	0.24	1.2	70	690	1800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-12-3	14-Jul-2012	0.0 - 0.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	390	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2012	0.4 - 0.9m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	23	95	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	14-Jul-2012	0.4 - 0.9m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	77	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2012	1.4 - 1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	16	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2012	1.8 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2012	3.0 - 4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	160	**1300** [#4]	3500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-14-1	04-Mar-2014	1.0m	0.0074	< 0.020	< 0.010	< 0.040	< 12	14	110	68	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	2.0m	0.026	0.044	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	< 0.0050	0.0058	< 0.0050	< 0.0050	**0.070** [#1]	0.014	< 0.0050
	04-Mar-2014	3.0m	2.9	35	18	79	**1400** [#3]	**7100** [#3]	**18000** [#3]	**7900** [#3]	**27000** [#3]	0.28 [#1]	< 0.43	0.18	< 0.13	0.067	0.18	0.083	0.16	**1.4** [#1]	0.042	**8.5** [#1]	**5.1** [#1]	0.67
(Duplicate)	04-Mar-2014	3.0m	0.61	0.82	0.40	2.2	92	190	**14000** [#3]	**9900** [#3]	**32000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	4.0m	0.034	0.038	0.046	0.22	< 12	95	190	63	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	5.0m	0.054	0.049	0.13	< 0.38	36	620	3600	2100	8800	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	6.0m	0.023	< 0.020	0.058	< 0.12	13	110	320	140	---	0.014	< 0.0068	< 0.0040	0.0083	< 0.0050	< 0.10	< 0.0050	0.0053	0.034	< 0.0050	**0.084** [#2]	**0.15** [#2]	0.024
BT3-14-4	04-Mar-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	61	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	83	< 50	---	< 0.0050	< 0.0050	< 0.0040	0.0050	0.0055	< 0.10	< 0.0050	0.0078	0.0064	0.0075	0.012	0.038	0.015
	04-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	130	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	160	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0086	**0.048** [#2]	0.011
	04-Mar-2014	5.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	180	490	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Mar-2014	5.5m	0.0082	< 0.020	< 0.010	0.057	60	770	1800	550	---	0.059	< 0.011	0.012	0.015	< 0.0050	< 0.10	0.0093	0.012	0.070	< 0.0050	**0.054** [#2]	**0.64** [#2]	0.069
(Duplicate)	04-Mar-2014	5.5m	0.0084	< 0.020	< 0.010	0.052	59	750	1800	590	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-14-6	03-Mar-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	71	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	91	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	140	440	170	---	< 0.0050	< 0.0050	< 0.0040	0.0064	0.0083	< 0.10	0.0069	0.010	0.012	0.0097	**0.016** [#1]	**0.049** [#1]	0.020
(Duplicate)	03-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	120	400	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	4.0m	0.0078	< 0.020	0.012	< 0.040	240	**1600** [#4]	4000	1400	5700	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	4.5m	< 0.0050	< 0.020	< 0.030	< 0.040	450	**1700** [#4]	4200	1500	6400	0.086	< 0.0055	< 0.029	< 0.026	< 0.0050	< 0.10	< 0.019	0.026	< 0.043	< 0.0050	**0.084** [#2]	**1.1** [#2]	0.14
BT3-16-01	26-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	60	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-03	26-Jun-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	140	570	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-04	26-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	54	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-05	26-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	65	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-06	26-Jun-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	160	91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-07	26-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	20	190	85	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			110	330	430	230	---	---	---	---	---	0.28	320	32	10	72	5.3	10	180	0.25	10	0.013	0.046	100
CCME Industrial Fine Sub-Surface [#2]			620	660	860	460	---	---	---	---	---	0.28	320	32	10	72	5.3	10	180	0.25	10	0.013	0.046	100
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	320	260	2500	6600	6600	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	800	1000	5000	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-08	26-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	96	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-09	26-Jun-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	110	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-11	26-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	140	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-12	26-Jun-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	140	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-13	26-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	110	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-14	26-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	100	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-15	26-Jun-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	170	77	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-16	27-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	95	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-17	27-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	92	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-18	27-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	31	180	63	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-19	27-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	130	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-20	27-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	18	340	82	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-21	27-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	27	290	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-22	28-Jun-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	16	150	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-23	28-Jun-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	150	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-30	06-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	28	240	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-31	06-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	87	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-32	06-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	210	70	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-33	06-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	62	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-34	06-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	110	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-35	06-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	74	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-36	06-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	170	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-38	07-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	93	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-39	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	110	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-40	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	80	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-41	07-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	110	52	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-42	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	180	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-43	07-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	67	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-44	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	14	< 10	81	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-45	07-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	180	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-46	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	160	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-47	07-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	98	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-48	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	19	28	85	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-60	07-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	110	63	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-63	08-Jul-2016	2.5	0.84	< 0.020	< 0.010	< 0.040	13	59	92	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-71	08-Jul-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	120	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-77	08-Jul-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	89	**1800** [#3]	**4000** [#3]	1400	5500	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-78	08-Jul-2016	2.0	0.0098	< 0.020	< 0.010	< 0.040	< 12	**1000** [#3]	**2700** [#3]	530	2900	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-79	08-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	72	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-97	22-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	100	64	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-98	22-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	100	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-99	22-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	84	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-100	22-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	23	67	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-101	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	31	310	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-102	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	33	320	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-103	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	25	220	79	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-104	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	53	110	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-105	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	24	270	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-106	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	160	770	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-107	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	26	260	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-108	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	33	250	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-109	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	27	260	91	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-110	24-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	38	120	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-111	24-Jul-2016	4.5	0.018	< 0.020	< 0.010	< 0.040	< 12	24	250	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-112	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	55	310	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-113	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	310	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-114	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	170	59	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-115	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	31	250	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-116	25-Jul-2016	4.5	0.027	0.034	< 0.010	< 0.040	< 12	72	450	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-117	25-Jul-2016	4.5	0.18	0.062	0.023	0.16	59	**2000** [#4]	**5600** [#4]	2000	8300	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-118	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	45	350	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-119	25-Jul-2016	4.5	0.0080	< 0.020	< 0.010	< 0.040	< 12	130	320	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-120	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	24	280	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-121	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	32	330	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-122	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	58	310	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-123	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	110	500	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-124	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	51	360	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-125	25-Jul-2016	4.5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	31	140	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-59	07-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	21	420	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-61	08-Jul-2016	2.5	0.028	< 0.020	0.025	0.086	< 12	130	380	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-62	08-Jul-2016	1.0	0.040	< 0.020	0.052	0.12	15	210	780	320	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-64	08-Jul-2016	1.0	0.035	< 0.020	< 0.010	< 0.040	22	190	880	330	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-65	08-Jul-2016	3.0	0.26	1.6	1.1	6.1	190	**2800** [#3]	**10000** [#3]	3500	**15000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-66	08-Jul-2016	2.0	0.14	0.037	2.7	3.4	210	**3500** [#3]	**6400** [#3]	2300	**10000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-67	08-Jul-2016	1.0	0.055	< 0.020	0.022	< 0.040	15	**1600** [#3]	**6600** [#3]	2400	**9800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-68	08-Jul-2016	3.0	1.1	0.66	1.7	4.7	260	**2400** [#3]	**8500** [#3]	3100	**13000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-69	08-Jul-2016	2.0	6.9	0.10	11	12	**1600** [#3]	**6500** [#3]	**24000** [#3]	**15000** [#3]	**49000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-70	08-Jul-2016	1.0	0.23	0.058	0.062	0.14	< 12	57	320	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-72	08-Jul-2016	2.0	0.040	< 0.020	0.16	0.33	**750** [#3]	**12000** [#3]	**25000** [#3]	**9800** [#3]	**42000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-73	08-Jul-2016	1.0	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-74	08-Jul-2016	3.0	< 0.0050	< 0.020	< 0.010	< 0.040	12	110	1400	640	2100	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-75	08-Jul-2016	2.0	< 0.0050	< 0.020	< 0.010	< 0.040	16	200	750	360	1300	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-16-76	08-Jul-2016	1.0	0.0084	< 0.020	0.026	< 0.040	16	**720** [#3]	**47000** [#3]	**40000** [#3]	**120000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-17-1	22-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0056	0.012	< 0.0050	0.0068	< 0.0050	0.0062	0.0083	0.022	0.012
	22-Sep-2017	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	51	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	0.0080	< 0.0050	0.0074	< 0.0050	0.0054	0.0055	0.020	0.011
	22-Sep-2017	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	14	150	70	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0065	0.013	< 0.0050	0.0096	< 0.0050	0.0067	0.013 [#2]	**0.048** [#2]	0.017
BT3-17-2	22-Sep-2017	0.5 - 1.0m	0.014	0.089	0.027	0.16	< 10	**440** [#3]	**7100** [#3]	4500	**16000** [#3]	0.0067	0.027	0.012	0.027	0.037	0.11	0.042	0.090	0.023	0.056	**0.065** [#1]	**1.5** [#1]	0.25
	22-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	0.0080	< 0.0050	0.0053	< 0.0050	< 0.0050	< 0.0050	0.019	0.0080

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH												
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-17-3	22-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	70	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.010	< 0.0050
(Duplicate)	22-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	16	100	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0074	0.014	0.0053
	22-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	0.0080	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.015	0.0076
	22-Sep-2017	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	24	250	120	---	< 0.0050	< 0.0050	< 0.0040	0.0061	0.0072	0.014	< 0.0050	0.010	0.0078	0.0068	0.012	**0.063** [#2]	0.022
BT97-15	26-Jul-1997	0.0 - 0.8m	---	---	---	---	---	---	---	---	---	< 0.001	< 0.004	< 0.005	0.005	< 0.001	---	< 0.002	0.005	0.011	< 0.002	**0.034** [#1]	**0.084** [#1]	0.012
	26-Jul-1997	2.3 - 3.8m	0.56	3.3	1.6	9.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT98-1	02-Sep-1998	4.5 - 6.0m	0.29	0.52	0.09	0.38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT98-2	02-Sep-1998	0.0 - 0.3m	0.16	0.38	0.18	1.12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Sep-1998	3.0 - 4.5m	< 0.02	< 0.03	0.04	0.16	---	---	---	---	---	< 0.01	< 0.01	< 0.01	< 0.08	< 0.01	---	< 0.02	< 0.01	**1.2** [#2]	< 0.02	**< 1.0** [#2]	**< 2.2** [#2]	< 0.48
	02-Sep-1998	4.5 - 6.0m	0.47	0.57	0.09	0.48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-27	17-Jun-1999	1.0 - 1.5m	3.3	< 0.04	< 0.04	< 0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Jun-1999	4.5 - 6.0m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-28	17-Jun-1999	1.0 - 1.5m	11	0.47	9.6	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Jun-1999	3.0 - 4.5m	0.14	0.06	0.13	0.63	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Jun-1999	4.5 - 6.0m	0.13	< 0.04	0.26	0.46	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-29	17-Jun-1999	4.5 - 6.0m	< 0.04	< 0.04	0.04	0.10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-30	17-Jun-1999	3.0 - 4.5m	< 0.04	< 0.04	< 0.04	< 0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Jun-1999	4.5 - 6.0m	0.06	< 0.04	< 0.04	0.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-31	18-Jun-1999	3.0 - 4.5m	0.07	< 0.04	< 0.04	< 0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-32	18-Jun-1999	3.0 - 4.5m	< 0.04	< 0.04	< 0.04	< 0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT99-35	18-Jun-1999	3.0 - 4.5m	< 0.04	< 0.04	< 0.04	0.11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Jun-1999	4.5 - 6.0m	< 0.04	< 0.04	< 0.04	< 0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BOS-13-2	07-Sep-2013	0.5 - 0.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	37	160	< 50	YES	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Sep-2013	0.9 - 1.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	61	250	72	YES	---	---	---	---	---	---	---	---	---	---	---	---	---
BOS-13-3	08-Sep-2013	0.5 - 0.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	55	240	73	YES	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Sep-2013	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	55	230	67	YES	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHCs									PAH													
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			110	330	430	230	---	---	---	---	---	0.28	320	32	10	72	5.3	10	180	0.25	10	0.013	0.046	100
CCME Industrial Fine Sub-Surface [#2]			620	660	860	460	---	---	---	---	---	0.28	320	32	10	72	5.3	10	180	0.25	10	0.013	0.046	100
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	320	260	2500	6600	6600	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	800	1000	5000	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 3
Water Quality Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	Carbonate (mg/L)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
Inorganic Parameters and Phenols								**Dissolved Metals**															
CCME CEQG Freshwater Aquatic Life [#1]		---	120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BATTERY #3 FLARE PIT																							
BOS DP 08-2	20-Aug-2009	---	---	---	---	---	4 [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BOS DP 98-1	16-Sep-1999	< 0.5	37	8.1	< 0.02	< 0.005	---	< 0.02	0.005 [#1]	0.033	< 0.0001 [#1]	0.002	< 0.001	**1.71** [#1]	< 0.001	< 0.00005 [#1]	0.01	< 0.008	< 0.001	< 0.0001	**0.02** [#1]	---	< 0.002
	18-Sep-2000	< 0.5	13	7.6	0.04	< 0.005	4 [#1]	0.07	0.002	0.019	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.087	< 0.001	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	< 0.005
	29-Aug-2001	< 0.5	23.8	7.8	< 0.02	< 0.005	**37** [#1]	**0.13** [#1]	< 0.05 [#1]	0.031	< 0.002 [#1]	< 0.005	< 0.005 [#1]	**1.34** [#1]	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
	24-Aug-2002	< 0.5	46.0	8.0	< 0.02	< 0.005	4 [#1]	0.004	**0.006** [#1]	0.029	< 0.00001	< 0.001	0.0013	**5.68** [#1]	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	0.00095	0.010
	25-Aug-2003	< 0.5	36	7.4	< 0.2	< 0.06	---	---	< 0.005	< 0.050	< 0.002 [#1]	< 0.007	< 0.009 [#1]	0.159	< 0.10 [#1]	< 0.00005 [#1]	---	---	**0.002** [#1]	---	---	< 1.0 [#1]	0.006
BOS DP 98-2	16-Sep-1999	< 0.5	76	7.6	0.02	< 0.005	---	0.04	**0.008** [#1]	0.025	< 0.0001 [#1]	< 0.002	< 0.001	**25.2** [#1]	< 0.001	< 0.00005 [#1]	0.005	< 0.008	0.001 [#1]	< 0.0001	< 0.02 [#1]	---	< 0.002
	18-Sep-2000	< 0.5	53	7.1	< 0.02	< 0.005	**25** [#1]	0.03	0.003	0.012	< 0.0001 [#1]	0.006	< 0.005 [#1]	**15.0** [#1]	< 0.001	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	0.016
	29-Aug-2001	< 0.5	55.0	7.4	< 0.02	< 0.005	**42** [#1]	< 0.02	< 0.05 [#1]	0.015	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.284	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
	24-Aug-2002	< 0.5	61.9	7.8	< 0.02	< 0.005	**16** [#1]	0.015	**0.006** [#1]	0.013	< 0.00001	< 0.001	0.0008	**27.1** [#1]	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	0.001 [#1]	< 0.0001	< 0.0001	0.00016	0.011
	25-Aug-2003	< 0.5	43	6.8	< 0.2	< 0.06	---	---	< 0.005	< 0.050	< 0.002 [#1]	< 0.007	< 0.009 [#1]	**18.45** [#1]	< 0.10 [#1]	< 0.00005 [#1]	---	---	0.001 [#1]	---	---	< 1.0 [#1]	< 0.005
BT3 02-32-6	20-Aug-2012	---	**360** [#1]	---	< 0.0030	< 0.0030	**22** [#1]	0.047	**0.029** [#1]	0.38	0.000024	< 0.0010	0.0015	**16** [#1]	0.00027	---	0.00037	0.015	0.0010 [#1]	< 0.00010	< 0.00020	0.0014	0.0092
	24-Aug-2013	---	**180** [#1]	---	0.0070	0.0044	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	---	110	---	0.21	0.023	---	0.021	**0.032** [#1]	0.37	< 0.000020	< 0.0010	0.0024	**16** [#1]	0.00033	---	< 0.00020	0.011	**0.0030** [#1]	< 0.000020	< 0.00020	0.0016	0.012
	08-Aug-2015	---	70	---	< 0.010	< 0.010	---	0.017	**0.051** [#1]	0.36	< 0.000020	< 0.0010	0.00086	**27** [#1]	0.00024	---	0.00020	0.0095	**0.0015** [#1]	< 0.00010	< 0.00020	0.0014	0.012
	05-Aug-2016	---	68	---	< 0.010	< 0.010	---	0.0093	**0.072** [#1]	0.27	< 0.000020	< 0.0010	0.00086	**27** [#1]	0.00022	---	0.00051	0.0098	**0.0011** [#1]	< 0.00010	< 0.00020	0.0015	0.010
	13-Aug-2017	---	63	---	0.024	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3 02-33-4	19-Aug-2008	< 0.5	25	7.6	0.095	0.013	4 [#1]	**0.22** [#1]	0.002	0.04	**0.00029** [#1]	< 0.001	**0.0062** [#1]	**3.3** [#1]	0.0008	---	0.0061	0.019	< 0.001	< 0.0001	< 0.0002	0.0045	**0.10** [#1]
	20-Aug-2009	< 0.5	27	7.31	0.21	0.014	< 2	0.006	0.0003	0.04	**0.00015** [#1]	< 0.001	**0.0056** [#1]	0.20	< 0.0002	---	0.0070	0.014	0.0003	< 0.0001	< 0.0002	0.0039	0.013
	21-Aug-2010	< 0.5	23	7.73	0.034	0.004	< 2	0.017	0.0008	0.04	**0.00010** [#1]	< 0.001	**0.0049** [#1]	0.23	< 0.0002	---	0.0031	0.010	0.0004	< 0.0001	< 0.0002	0.0026	0.012
	20-Aug-2011	---	16	---	0.41	< 0.003	< 2	< 0.01	< 0.002	0.04	**0.00012** [#1]	< 0.01 [#1]	**0.006** [#1]	0.12	< 0.002	---	< 0.002	0.008	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.002	< 0.03
	20-Aug-2012	---	11	---	0.33	0.0058	< 2.0	0.0080	0.00042	0.038	0.000067	< 0.0010	**0.0044** [#1]	0.068	< 0.00020	---	0.0015	0.0081	0.00025	< 0.00010	< 0.00020	0.0020	0.0059
BT3 93-19-17	16-Sep-1999	< 0.5	**4500** [#1]	7.9	< 0.02	< 0.005	---	< 0.02	0.002	1.17	< 0.0001 [#1]	0.003	< 0.001	**3.7** [#1]	< 0.001	< 0.00005 [#1]	< 0.004	< 0.008	< 0.001	< 0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	< 0.5	**4500** [#1]	7.3	< 0.02	< 0.005	**34** [#1]	< 0.02	< 0.001	1.12	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.031	< 0.001	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	< 0.005
	27-Aug-2001	< 0.5	**4490** [#1]	7.1	< 0.02	< 0.005	**22** [#1]	0.03	< 0.05 [#1]	1.07	< 0.002 [#1]	0.006	< 0.005 [#1]	0.057	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	0.014
(Duplicate)	29-Aug-2001	< 0.5	**4190** [#1]	7.4	< 0.02	< 0.005	2	0.03	< 0.05 [#1]	1.09	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.088	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	0.008
	20-Aug-2002	< 0.5	**4090** [#1]	7.7	< 0.02	< 0.005	**26** [#1]	< 0.001	0.001	1.03	< 0.00010 [#1]	< 0.001	**0.0170** [#1]	**1.90** [#1]	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	**0.002** [#1]	< 0.0001	< 0.0001	0.00041	< 0.005
(Duplicate)	20-Aug-2002	< 0.5	**4260** [#1]	7.7	< 0.02	< 0.005	**27** [#1]	< 0.001	0.001	1.05	< 0.00010 [#1]	0.003	**0.0194** [#1]	**2.46** [#1]	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	< 0.00010	< 0.005
	25-Aug-2003	< 0.5	**3770** [#1]	6.8	< 0.2	< 0.06	---	---	< 0.005	0.928	< 0.002 [#1]	< 0.007	< 0.009 [#1]	**1.436** [#1]	< 0.10 [#1]	< 0.00005 [#1]	---	---	< 0.001	---	---	< 1.0 [#1]	0.005

Advisian
WorleyParsons Group

Table 3
Water Quality Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

		Inorganic Parameters and Phenols						Dissolved Metals														
Monitoring Station	Date (dd-mmm-yyyy)	Carbonate (mg/L)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BT3 98-17-3	19-Aug-2008	---	6.6	---	0.13	**0.25** [#1]	**47** [#1]	0.031	**0.012** [#1]	0.08	0.00002	< 0.001	0.0017	**11** [#1]	0.0003	---	0.018	0.0086	**0.002** [#1]	< 0.0001	< 0.0002	0.0051	**0.097** [#1]
(Duplicate)	19-Aug-2008	---	---	---	---	---	**52** [#1]	0.009	**0.011** [#1]	0.07	0.00004	< 0.001	**0.0055** [#1]	**10** [#1]	< 0.0002	---	0.016	0.0079	0.001 [#1]	< 0.0001	< 0.0002	0.0050	**0.034** [#1]
	17-Aug-2009	< 0.5	6	7.00	0.019	0.003	**12** [#1]	0.008	0.0049	0.06	< 0.000005	< 0.001	0.0017	**8.5** [#1]	< 0.0002	---	0.0048	0.0065	**0.0012** [#1]	< 0.0001	< 0.0002	0.0051	0.008
	21-Aug-2010	< 0.5	5	7.43	0.59	0.010	**15** [#1]	0.015	**0.0097** [#1]	0.10	< 0.00003	< 0.001	0.0014	**9.3** [#1]	0.0003	---	0.0081	0.0070	**0.0013** [#1]	< 0.0001	< 0.0002	0.0017	0.003
	20-Aug-2011	---	5	---	< 0.03	< 0.03	4 [#1]	0.01	**0.008** [#1]	0.07	< 0.00005	< 0.01 [#1]	< 0.002	**9.8** [#1]	< 0.002	---	0.004	0.007	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.003	**0.04** [#1]
	16-Aug-2012	---	4.6	---	0.0053	< 0.0030	**11** [#1]	0.016	**0.0081** [#1]	0.080	< 0.000025	< 0.0010	0.0012	**8.5** [#1]	0.00021	---	0.0061	0.0059	**0.0012** [#1]	< 0.00010	< 0.00020	0.0017	0.0043
BT3 99-20-13	24-Aug-2013	---	**310** [#1]	---	< 0.0030	0.0036	**13** [#1]	0.0042	0.0023	0.66	< 0.000025	< 0.0010	< 0.00020	0.17	< 0.00020	---	< 0.00020	0.0017	**0.0070** [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	24-Aug-2013	---	**320** [#1]	---	0.0042	0.0046	**11** [#1]	0.0046	0.0022	0.66	< 0.000025	< 0.0010	< 0.00020	0.17	< 0.00020	---	< 0.00020	0.0016	**0.0055** [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	31-Jul-2014	---	**530** [#1]	---	0.012	< 0.010	**7.3** [#1]	0.0059	0.00064	0.80	0.000027	< 0.0010	0.00061	< 0.060	< 0.00020	---	< 0.00020	< 0.00050	**0.012** [#1]	< 0.000020	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	31-Jul-2014	---	**540** [#1]	---	< 0.010	< 0.010	**18** [#1]	0.0045	0.00045	0.82	< 0.000020	< 0.0010	0.00040	0.23	< 0.00020	---	< 0.00020	< 0.00050	**0.013** [#1]	< 0.000020	< 0.00020	< 0.00010	< 0.0030
	08-Aug-2015	---	**570** [#1]	---	< 0.010	0.013	---	< 0.0030	0.0015	0.81	< 0.000020	< 0.0010	< 0.00020	0.11	< 0.00020	---	< 0.00020	0.0013	**0.012** [#1]	< 0.00010	< 0.00020	0.00028	< 0.0030
	05-Aug-2016	---	**690** [#1]	---	< 0.010	< 0.010	---	0.0036	0.00090	0.71	< 0.000020	< 0.0010	0.00038	0.082	< 0.00020	---	0.00062	0.0024	**0.0014** [#1]	< 0.00010	< 0.00020	0.00023	0.0060
	13-Aug-2017	---	**410** [#1]	---	< 0.010	< 0.010	---	0.0071	0.00079	0.85	< 0.000020	< 0.0010	0.0024	0.085	< 0.00020	---	< 0.00020	0.013	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
BT3 99-21-12	23-Aug-2013	---	**270** [#1]	---	**4.0** [#1]	0.052	**11** [#1]	0.0059	0.0016	0.54	< 0.000025	< 0.0010	0.0015	**1.2** [#1]	< 0.00020	---	0.0016	0.0099	**0.0016** [#1]	< 0.00010	< 0.00020	0.0023	0.0055
	31-Jul-2014	---	**200** [#1]	---	1.9	**0.073** [#1]	**6.4** [#1]	0.0048	0.0013	0.33	< 0.000020	< 0.0010	0.0019	**0.33** [#1]	< 0.00020	---	0.0016	0.018	0.00044	< 0.00010	< 0.00020	0.0069	0.0070
	08-Aug-2015	---	77	---	0.25	0.014	---	< 0.0030	0.0017	0.11	< 0.000020	< 0.0010	0.0010	0.24	< 0.00020	---	0.0070	0.012	**0.0016** [#1]	< 0.00010	< 0.00020	0.0036	0.012
	05-Aug-2016	---	**160** [#1]	---	1.1	0.042	---	0.0053	0.0011	0.087	0.000031	< 0.0010	0.0014	< 0.060	< 0.00020	---	0.0044	0.014	0.00037	< 0.00010	< 0.00020	0.0069	0.016
	13-Aug-2017	---	**330** [#1]	---	0.75	0.016	---	0.072	0.0033	0.41	< 0.000020	< 0.0010	0.0013	**1.5** [#1]	0.00026	---	0.0037	0.0067	0.00022	< 0.00010	< 0.00020	0.0048	0.0043
BT3 99-22-26	16-Sep-1999	< 0.5	**10000** [#1]	7.5	0.5	**0.096** [#1]	---	< 0.02	**0.011** [#1]	1.1	**0.0014** [#1]	0.008	< 0.001	**0.471** [#1]	< 0.001	< 0.00005 [#1]	0.007	0.02	< 0.001	0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	< 0.5	**9300** [#1]	7.1	< 0.02	< 0.005	**154** [#1]	< 0.02	< 0.010 [#1]	1.16	< 0.0010 [#1]	0.005	< 0.005 [#1]	**0.366** [#1]	< 0.005	< 0.00005 [#1]	< 0.005	< 0.008	< 0.010 [#1]	< 0.0010 [#1]	< 0.03 [#1]	---	< 0.005
	27-Aug-2001	< 0.5	**7460** [#1]	6.9	< 0.02	< 0.005	**48** [#1]	0.07	< 0.05 [#1]	1.06	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.267	< 0.03 [#1]	---	< 0.005	0.009	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
	20-Aug-2002	< 0.5	**6390** [#1]	8.1	< 0.02	< 0.005	**102** [#1]	**1.19** [#1]	< 0.010 [#1]	1.33	< 0.00050 [#1]	< 0.010 [#1]	**0.0304** [#1]	**23.5** [#1]	< 0.0050	< 0.00005 [#1]	< 0.005	< 0.008	< 0.010 [#1]	< 0.0010 [#1]	< 0.0010 [#1]	0.00071	0.016
	25-Aug-2003	< 0.5	**7260** [#1]	6.7	< 0.2	< 0.06	---	---	**0.011** [#1]	1.341	< 0.002 [#1]	< 0.007	< 0.009 [#1]	**12.96** [#1]	< 0.10 [#1]	< 0.00005 [#1]	---	---	< 0.001	---	---	< 1.0 [#1]	< 0.005
	15-Nov-2014	< 0.50	**5200** [#1]	7.15	< 0.010	< 0.010	---	---	---	---	---	---	---	**1.6** [#1]	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 3
Water Quality Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols						Dissolved Metals															
		Carbonate (mg/L)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BT3 99-23-13	24-Aug-2013	---	**2900** [#1]	---	< 0.030	0.034	**53** [#1]	0.0035	0.0018	**1.7** [#1]	0.000076	< 0.0010	< 0.00020	**1.8** [#1]	< 0.00020	---	< 0.00020	0.0041	**0.0029** [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	24-Aug-2013	---	**3000** [#1]	---	< 0.030	0.032	**40** [#1]	0.0034	0.0019	**1.7** [#1]	0.000088	< 0.0010	< 0.00020	**1.7** [#1]	< 0.00020	---	< 0.00020	0.0040	**0.0034** [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	31-Jul-2014	---	**1900** [#1]	---	0.42	0.029	**20** [#1]	0.0054	0.00058	**1.7** [#1]	< 0.000020	< 0.0010	0.00020	**0.45** [#1]	< 0.00020	---	< 0.00020	0.00060	**0.021** [#1]	< 0.000020	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	31-Jul-2014	---	**1900** [#1]	---	0.028	< 0.010	**17** [#1]	0.0069	0.00051	**1.7** [#1]	< 0.000020	< 0.0010	0.00026	**0.44** [#1]	< 0.00020	---	< 0.00020	< 0.00050	**0.018** [#1]	< 0.000020	< 0.00020	< 0.00010	< 0.0030
	15-Nov-2014	< 0.50	**2800** [#1]	7.35	< 0.010	< 0.010	---	---	---	---	---	---	---	< 0.60 [#1]	---	---	---	---	---	---	---	---	---	---
	08-Aug-2015	---	**2800** [#1]	---	< 0.010	< 0.010	---	< 0.060	< 0.0040	**1.6** [#1]	< 0.00040 [#1]	< 0.020 [#1]	< 0.0040	**0.99** [#1]	< 0.0040	---	< 0.0040	< 0.010	**0.0042** [#1]	< 0.0020 [#1]	< 0.0040 [#1]	< 0.0020	< 0.060 [#1]
(Duplicate)	08-Aug-2015	---	---	---	---	---	---	< 0.0030	0.0018	**1.6** [#1]	0.000030	< 0.0010	< 0.00020	**0.93** [#1]	< 0.00020	---	< 0.00020	0.0012	**0.0098** [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	05-Aug-2016	---	**3700** [#1]	---	< 0.010	< 0.010	---	< 0.030	< 0.0020	1.5 [#1]	< 0.00020 [#1]	< 0.010 [#1]	< 0.0020	**2.0** [#1]	< 0.0020	---	< 0.0020	< 0.0050	< 0.0020 [#1]	< 0.0010 [#1]	< 0.0020 [#1]	< 0.0010	< 0.030
(Duplicate)	05-Aug-2016	---	**3700** [#1]	---	< 0.010	< 0.010	---	< 0.030	< 0.0020	1.5 [#1]	< 0.00020 [#1]	< 0.010 [#1]	< 0.0020	**1.9** [#1]	< 0.0020	---	< 0.0020	< 0.0050	< 0.0020 [#1]	< 0.0010 [#1]	< 0.0020 [#1]	< 0.0010	< 0.030
	13-Aug-2017	---	**3900** [#1]	---	< 0.10	< 0.10 [#1]	---	0.0032	0.00062	**1.7** [#1]	< 0.000020	< 0.0010	0.00040	**0.96** [#1]	< 0.00020	---	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	13-Aug-2017	---	**3600** [#1]	---	< 0.10	< 0.10 [#1]	---	0.0036	0.00069	**1.7** [#1]	< 0.000020	< 0.0010	0.00045	**0.98** [#1]	< 0.00020	---	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
BT3 99-27-20	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3 SW01	20-Aug-2009	< 0.5	15	7.74	< 0.003	< 0.003	3	---	---	---	---	---	---	**0.45** [#1]	---	---	---	---	---	---	---	---	---
	21-Aug-2010	< 0.5	15	7.75	0.061	0.004	< 2	---	---	---	---	---	---	0.13	---	---	---	---	---	---	---	---	---
	20-Aug-2011	< 0.5	17	8.04	< 0.003	< 0.003	**32** [#1]	---	---	---	---	---	---	0.10	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.50	11	7.92	< 0.0030	< 0.0030	2.8	---	---	---	---	---	---	0.061	---	---	---	---	---	---	---	---	---
BT3-EW1	30-Jul-1999	60.3	**2000** [#1]	8.5	---	---	---	**0.51** [#1]	**0.14** [#1]	1.30	< 0.002 [#1]	0.002	0.003	**1.38** [#1]	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	**0.041** [#1]
	15-Nov-2014	< 0.50	**15000** [#1]	6.85	< 1.0	< 1.0 [#1]	---	---	---	---	---	---	---	**22** [#1]	---	---	---	---	---	---	---	---	---	---
BT3-OBS1	03-Aug-2000	< 0.5	**3900** [#1]	7.4	0.03	< 0.005	---	0.07	< 0.05 [#1]	1.46	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.179	< 0.03 [#1]	---	0.007	0.018	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	0.017
	15-Nov-2014	< 0.50	**20000** [#1]	6.92	< 0.050	**7.5** [#1]	---	---	---	---	---	---	---	**20** [#1]	---	---	---	---	---	---	---	---	---	---
BT3-OBS2	30-Jul-1999	13.9	**1500** [#1]	8.4	---	---	---	**0.21** [#1]	**0.04** [#1]	1.06	< 0.002 [#1]	< 0.002	< 0.001	0.232	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	**0.065** [#1]
BT3-OBS3	30-Jul-1999	< 0.5	**3100** [#1]	7.8	---	---	---	0.06	< 0.04 [#1]	1.14	< 0.002 [#1]	0.002	< 0.001	0.081	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	**0.069** [#1]
	03-Aug-2000	< 0.5	**4100** [#1]	7.3	< 0.02	< 0.005	---	0.07	< 0.05 [#1]	1.31	< 0.002 [#1]	0.006	< 0.005 [#1]	0.113	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
	15-Nov-2014	< 0.50	**8600** [#1]	7.12	< 0.010	< 0.010	---	---	---	---	---	---	---	**2.3** [#1]	---	---	---	---	---	---	---	---	---	---
BT3-OBS5	30-Jul-1999	< 0.5	**31000** [#1]	6.9	---	---	---	**0.12** [#1]	**0.13** [#1]	0.632	< 0.002 [#1]	**0.010** [#1]	< 0.001	**2.51** [#1]	< 0.02 [#1]	---	< 0.004	0.019	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	< 0.002
	03-Aug-2000	< 0.5	**20000** [#1]	6.7	< 0.02	0.005	---	**0.11** [#1]	< 0.05 [#1]	0.949	< 0.002 [#1]	**0.010** [#1]	< 0.005 [#1]	**1.70** [#1]	< 0.03 [#1]	---	< 0.005	0.025	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
	15-Nov-2014	< 0.50	**1900** [#1]	7.36	< 0.010	< 0.010	---	---	---	---	---	---	---	< 0.60 [#1]	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 3
Water Quality Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

		Inorganic Parameters and Phenols						Dissolved Metals														
Monitoring Station	Date (dd-mmm-yyyy)	Carbonate (mg/L)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		---	120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BT3-OBS6	30-Jul-1999	< 0.5	**2200** [#1]	8.1	---	---	---	**0.42** [#1]	< 0.04 [#1]	1.45	< 0.002 [#1]	< 0.002	< 0.001	**0.930** [#1]	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	0.024
	03-Aug-2000	< 0.5	**1800** [#1]	7.7	< 0.02	< 0.005	---	0.08	< 0.05 [#1]	1.44	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.158	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	0.013
	15-Nov-2014	---	**6700** [#1]	7.86	< 0.010	< 0.010	---	---	---	---	---	---	---	< 0.60 [#1]	---	---	---	---	---	---	---	---	---
BOS-DP-13-2-1.35	17-Sep-2013	< 0.50	**650** [#1]	7.63	0.012	0.0050	**40** [#1]	0.0050	0.0049	0.074	0.000030	< 0.0010	0.00024	**14** [#1]	< 0.00020	---	0.013	0.012	0.00044	< 0.00010	< 0.00020	0.0031	0.011
	31-Jul-2014	< 0.50	**490** [#1]	8.06	0.054	< 0.010	---	0.0052	0.0028	0.045	0.000022	< 0.0010	**0.019** [#1]	**13** [#1]	< 0.00020	---	0.0022	0.0017	0.00084	< 0.00010	< 0.00020	0.00053	0.0097
	06-Aug-2016	< 0.50	**320** [#1]	7.69	0.67	0.035	**12** [#1]	0.012	**0.0086** [#1]	0.053	< 0.000020	< 0.0010	0.00086	**0.85** [#1]	< 0.00020	---	0.013	0.0080	0.00024	< 0.00010	< 0.00020	0.0010	0.0074
	18-Aug-2017	< 0.50	**530** [#1]	---	0.026	< 0.010	---	0.030	0.013	0.059	< 0.000020	< 0.0010	0.00031	**20** [#1]	< 0.00020	---	0.0011	0.0019	0.00023	< 0.00010	< 0.00020	0.00012	0.0094
BOS-DP-13-3-2	17-Sep-2013	< 0.50	**280** [#1]	8.11	0.0074	0.0057	**36** [#1]	0.012	0.0030	0.11	0.000047	< 0.0010	0.0033	< 0.060	< 0.00020	---	0.034	0.0095	0.00060	< 0.00010	< 0.00020	0.0049	0.0066
	31-Jul-2014	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-2014	< 0.50	**180** [#1]	8.12	< 0.010	< 0.010	---	---	---	---	---	---	---	**0.66** [#1]	---	---	---	---	---	---	---	---	---
	10-Aug-2015	---	---	---	---	---	3	0.015	**0.0090** [#1]	0.052	0.000033	< 0.0010	0.00099	**1.4** [#1]	0.00031	---	0.0063	0.0023	< 0.00020	< 0.00010	< 0.00020	0.00045	0.0032
	06-Aug-2016	< 0.50	92	8.16	0.089	< 0.010	---	---	---	---	---	---	---	**2.4** [#1]	---	---	---	---	---	---	---	---	---
	18-Aug-2017	< 0.50	82	---	0.074	< 0.010	**6.7** [#1]	---	---	---	---	---	---	**2.8** [#1]	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 4
Surface Water Analytical Results: Total Metals

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BATTERY #3 FLARE PIT																
BT3 SW01	20-Aug-2009	0.021	0.002	< 0.02	< 0.00003	< 0.005	< 0.001	**0.56** [#1]	< 0.001	0.025	0.007	< 0.001	< 0.0005 [#1]	< 0.001 [#1]	0.012	0.03 [#1]
	21-Aug-2010	**0.31** [#1]	**0.0054** [#1]	< 0.02	0.00005	< 0.001	0.0020	**5.3** [#1]	0.0014	0.017	0.0065	0.0007	< 0.0001	< 0.0002	0.0038	**0.046** [#1]
	20-Aug-2011	0.027	**0.0053** [#1]	< 0.02	< 0.000005	< 0.001	< 0.0002	0.20	< 0.0002	< 0.0002	0.0043	0.0008	< 0.0001	< 0.0002	0.0003	< 0.003
	16-Aug-2012	0.057	0.0023	0.046	0.000057	< 0.0010	0.0014	**1.0** [#1]	0.00028	0.0024	0.0097	**0.0011** [#1]	< 0.00010	< 0.00020	0.0014	**0.046** [#1]

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 5
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
BATTERY #3 FLARE PIT																		
BOS DP 08-2	20-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	17	< 0.3	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	0.45	< 0.1	---	---	---	---	---	---	---	---	---	---	---
BOS DP 98-1	16-Sep-1999	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2002	< 0.0005	0.0006	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---
BOS DP 98-2	16-Sep-1999	< 0.0050	< 0.0050 [#1]	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2000	0.0025	< 0.0005	< 0.0005	0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Aug-2001	< 0.0050	< 0.0050 [#1]	< 0.0050	< 0.01	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2002	0.0021	**0.0030** [#1]	< 0.0005	0.0043	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	0.0015	0.0005	< 0.0005	< 0.001	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---
BT3 02-32-6	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	0.13	0.6	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	0.0014	< 0.0004	< 0.0004	< 0.0008	0.14	2.7	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	0.0017	< 0.0004	< 0.0004	< 0.0008	0.13	2.0	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	0.0012	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.9	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	0.0013	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.88	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	08-Aug-2015	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00015	< 0.000050	< 0.000020	---
	05-Aug-2016	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000053	< 0.00010	< 0.000050	**0.000029** [#1]	---
	13-Aug-2017	---	---	---	---	---	---	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000066	< 0.00010	0.00010	**0.000052** [#1]	< 0.00020
BT3 02-33-4	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
BT3 93-19-17	16-Sep-1999	0.0006	< 0.0005	< 0.0005	0.0007	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	0.0009	< 0.0005	< 0.0005	(0.00080-0.0013)	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Aug-2001	0.0006	< 0.0005	< 0.0005	(0.00070-0.0012)	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2002	0.0007	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2002	0.0007	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	0.0012	< 0.0005	< 0.0005	< 0.001	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---
BT3 98-17-3	19-Aug-2008	0.024	< 0.0004	< 0.0004	< 0.0008	0.1	1.8	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2008	0.023	< 0.0004	< 0.0004	< 0.0008	0.39	1.9	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	0.027	0.0006	0.0005	< 0.0008	0.21	4.0	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	0.0059	< 0.0004	< 0.0004	< 0.0008	< 0.1	9.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	0.0031	0.0005	< 0.0004	< 0.0008	0.14	3.9	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2012	0.0025	< 0.00040	< 0.00040	< 0.00080	< 0.1	6.3	---	---	---	---	---	---	---	---	---	---	---
BT3 99-20-13	21-Aug-2010	0.0014	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	0.0045	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2011	0.0030	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	0.0040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2012	0.0040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2013	0.00089	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	24-Aug-2013	0.00085	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	0.0014	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	31-Jul-2014	0.0014	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
BT3 99-21-12	21-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	0.0014	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	0.0020	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.00021	< 0.000020	---
	08-Aug-2015	---	---	---	---	---	---	< 0.00011	---	< 0.000011	< 0.0000090	< 0.0000079	< 0.000011	< 0.000053	< 0.00011	< 0.000053	< 0.000021	---
	05-Aug-2016	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	13-Aug-2017	---	---	---	---	---	---	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.00019	< 0.000020	< 0.00020
BT3 99-22-26	16-Sep-1999	0.1	**0.094** [#1]	0.018	0.15	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2000	0.09	**0.035** [#1]	0.0056	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	0.16	**0.082** [#1]	0.016	0.14	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
BT3 99-23-13	22-Aug-2010	0.011	< 0.0004	0.0007	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	0.0051	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	0.013	< 0.00040	< 0.00040	0.0011	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2013	0.031	< 0.00040	0.00058	0.0019	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	24-Aug-2013	0.03	< 0.00040	0.00047	0.0018	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	0.022	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00019	< 0.000050	< 0.000020	---
(Duplicate)	31-Jul-2014	0.025	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00018	< 0.000050	< 0.000020	---
	08-Aug-2015	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00010	< 0.000050	< 0.000020	---
(Duplicate)	08-Aug-2015	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00020	< 0.000050	< 0.000020	---
	05-Aug-2016	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00020	< 0.000050	< 0.000020	---
(Duplicate)	05-Aug-2016	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00020	< 0.000050	< 0.000020	---
	13-Aug-2017	---	---	---	---	---	---	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
(Duplicate)	13-Aug-2017	---	---	---	---	---	---	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	< 0.00020
BT3 99-27-20	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---
BT3 SW01	20-Aug-2009	< 0.0004	0.0006	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
BT3-EW1	30-Jul-1999	0.083	**0.026** [#1]	0.017	0.12	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-OBS1	03-Aug-2000	0.011	**0.0028** [#1]	0.0027	0.015	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-OBS2	30-Jul-1999	0.016	0.0014	0.0014	0.0048	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-OBS3	30-Jul-1999	0.016	**0.0032** [#1]	0.0008	0.0045	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2000	0.0079	0.0015	0.0013	0.0049	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-OBS5	30-Jul-1999	0.0006	0.0005	0.0007	0.0028	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2000	0.0011	< 0.0005	< 0.0005	0.0014	---	---	---	---	---	---	---	---	---	---	---	---	---
BT3-OBS6	30-Jul-1999	< 0.0005	< 0.0005	< 0.0005	0.0018	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2000	0.035	< 0.0005	0.0088	0.0028	---	---	---	---	---	---	---	---	---	---	---	---	---
BOS-DP-13-2-1.35	17-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000050	**0.000030** [#1]	**0.000042** [#1]	< 0.0000075	**0.00033** [#1]	0.000068	< 0.00010	0.00032	**0.00023** [#1]	< 0.00020

Advisian
WorleyParsons Group

Table 5
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
BOS-DP-13-3-2	17-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	10-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	06-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.12	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	18-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	0.00015	< 0.000050	**0.000086** [#1]	**0.00013** [#1]	**0.000021** [#1]	**0.00088** [#1]	0.00017	< 0.00010	**0.00089** [#1]	**0.00061** [#1]	< 0.00020

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Appendix 6 Conceptual Site Model: Refinery Bank



Imperial

Conceptual Site Model

Refinery Bank (APEC ME-17), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0001

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0001 - Conceptual Site Model: Refinery Bank (APEC ME-17), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	D.Greves	M. Brown	S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 2

Figures

Figure 1 Site Location Map

Figure 2 Historical Air Photo 1979

Figure 3 Site Plan Showing Topography

Figure 4A Site Plan Showing Soil Sampling Locations

Figure 4B Site Plan Showing Groundwater Sampling Locations

Figure 5A Site 3-D Plan Visualization

Figure 5B Cross-Section A-A' (North to Southeast)

Figure 5C Cross-Section B-B' (North to Southwest)

Figure 5D Cross-Section C-C' (Northwest to Southeast)

Figure 6 Site Plan Showing Soil Petroleum Hydrocarbon Analytical Results

Figure 7 Site Plan Showing Groundwater Petroleum Hydrocarbon Analytical Results

Figure 8 Conceptual Site Model

Figure 9 Conceptual Exposure Model, Current Land Use and Site Condition

Tables

Table 1 Soil Analytical Results: Inorganic Parameters

Table 2 Soil Analytical Results: Organic Parameters

Table 3 Groundwater Analytical Results: Inorganic Parameters

Table 4 Groundwater Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE		
	Site Description:	Road bordering the northern edge of the Site (Figure 1, 4A). Road running from the east to the south (Fuel Loading Dock) Fuel Loading Dock is on the south edge of site and remains active 7 u/g fuel pipelines run N-S from Fuel Loading Dock to Tank Farm. C-41X is an active well in the NE corner of Site.
	Current Land Use:	CCME Industrial land use
	Future Land Use:	CCME Industrial land use
HISTORICAL LAND USE		
1.	Infrastructure Type:	Former Refinery (Figure 2, 1979 air photo)
	Notes:	Refining crude oil
	Years Active:	Constructed in 1940; decommissioned in 1998
2.	Infrastructure Type:	Fuel Loading Dock
	Notes:	Transporting refined product, currently in use handling various fuels for local use. Pipeline leak in 1998 within pipeline ROW on middle terrace near current location of well RB-RW-11.
	Years Active:	Likely from ~1940; shown in earliest airphoto (1950).
3.	Infrastructure Type:	C-41X
	Notes:	Injection well
	Years Active:	Spud date July 1942; currently in use
SITE SETTING		
	Topography and Drainage:	Site slopes to the South across a series of three terraces (denoted upper, middle and lower). Drainage is toward the Mackenzie River flood plain. See Figures 2, 3, 4A/B, 5A to 5D.
	Nearby Surface Water Bodies (Distance and Direction):	Mackenzie River (about 140 m to South of 1998 pipeline leak, when comparing to typical river level based on 40.5 m elevation contour).
SOIL AND GROUNDWATER CONDITIONS		
	Surficial Materials:	Silt, sandy silt, silty sand, silty clay, or sandy clay (Figures 5A to 5D).
	Depth to Permafrost:	Permafrost not present
	Depth to Bedrock:	Varies: approx. 2 to 3 mbgs at beach; approx. 6 to 9 mbgs at upper terrace.
	Bedrock Lithology:	Fractured siltstone, sandstone and shale
	Number of Groundwater-Bearing	3

Zones:	
Number of Piezometers:	57 existing, 33 historical now destroyed/decommissioned, 10 active remediation.
Free Product in Upper Groundwater-Bearing Zone:	Yes, maximum thickness (in past 5 years) was 0.36 m as measured in well RB-RW-3 (Jul-2014).
Free Product in Second Groundwater-Bearing Zone:	Yes, maximum thickness (in past 5 years) was 1.44 m as measured in well RB-RW-11 (Sep-2014).
<u>First Groundwater-Bearing Zone</u>	
Primary Soil Type/Lithology:	Unconsolidated sand, silt, and silty sand.
Dominant Grain Size:	Grain size is predominantly fine-grained, but there are deposits of sand across the site as well. Due to the presence of pipeline ROWs backfilled with sand, sand pathways act as a potential conduit for contaminant transport. Based on this rationale, the governing grain size for contaminant transport should be classified as coarse.
Depth to Groundwater Surface:	~3 mbgs at lower terrace (variation across seasons and site location).
Hydraulic Conductivity (Minimum):	4.3×10^{-6} m /s
Hydraulic Conductivity (Maximum):	5.5×10^{-6} m/s
Hydraulic Conductivity (Geometric Mean K):	4.9×10^{-6} m/s
Vertical Hydraulic Gradient:	Downward
Lateral Hydraulic Gradient (I):	Spatially and temporally variable from about 0.003 to 0.04, but typically I = 0.006 (based on fluid level observed historically in near-source well RB-OBS38, compared to typical river level 170 m away at 40.5 m elevation contour). Typical river level is exhibited in Figure 3, and the mean high water elevation is shown for comparison. When river is at mean high water elevation of 42.0 m, the lateral gradient is reversed with flow potential into the bank.
Groundwater Flow Direction and Velocity:	South towards Mackenzie River; velocity of a non-reactive tracer estimated at 4.6 m/year (based on v = KI/n) and dissolved petroleum hydrocarbons (PHC) velocity of 2.1 m/year or less. This estimate is based on the "typical" lateral gradient listed above. The reversed lateral gradient noted during river flood stage would only be applicable about 1-2 months per year.
<u>Second Groundwater-Bearing Zone</u>	
Primary Soil Type/Lithology:	Fractured siltstone, sandstone and shale
Dominant Grain Size:	Fracture flow
Depth to Groundwater Surface:	~12 mbgs at middle terrace (variation across seasons and site location).
Hydraulic Conductivity (Minimum):	4.9×10^{-10} m /s

Hydraulic Conductivity (Maximum):	>1.0 x 10^{-5} m/s
Hydraulic Conductivity (Geometric Mean K):	5.6 x 10^{-5} m/s
Lateral Hydraulic Gradient (I):	Spatially and temporally variable from about 0.006 to 0.02, but typically I = 0.006 is estimated and used for flow velocity calculations. Note discussion of typical river level and mean high water elevation above under first groundwater bearing zone. When remedial pumping wells are active, lateral gradient toward river is decreased or reversed.
Groundwater Flow Direction and Velocity:	South towards Mackenzie River; velocity of a non-reactive tracer estimated at 53 m/year (based on v = KI/n) and dissolved PHC velocity of 14 m/year or less. This estimate is based on typical lateral gradient, when remedial pumping wells are not active.
<u>Third Groundwater-Bearing Zone</u>	
Primary Soil Type/Lithology:	Siltstone, sandstone and shale
Dominant Grain Size:	n/a
Depth to Groundwater Surface:	~25 mbgs (limited local monitoring wells in this zone due to natural seepage of crude oil and saline water at this depth and deeper).
Hydraulic Conductivity (Minimum):	n/a
Hydraulic Conductivity (Maximum):	n/a
Hydraulic Conductivity (Geometric Mean K):	n/a
Lateral Hydraulic Gradient (I):	n/a
Groundwater Flow Direction and Velocity:	n/a
<u>HISTORICAL ENVIRONMENTAL ACTIVITIES</u>	
	Soil and Groundwater characterization (since 1997). Geophysical characterizations (since 1997). Partial Remedial Excavation at Jet "B" fuel spill (1999). GW pumping system (RB-GWTF) (since 2003). Multiphase extraction (RB-MPE) (since 2004).
<u>CURRENT STATUS</u>	
	Remaining soil and groundwater impacts (Figures 6 and 7) Facility related issues are complicated by the presence of natural hydrocarbon seeps in the area, which are documented along the beach east and west of the fuel loading dock. Natural seepage also occurs in the upper bedrock in this area, affecting salinity, hydrocarbon and PAH concentrations observed.

Sources and Impacts

SOURCES	
Historical Sources:	Leak from a u/g pipeline in middle terrace, carrying Jet "B" fuel (APEC ME-17; Appendix 4). Former Refinery, with a number of potential sources (Figures 3, 4A): • API separator, • the load line valving area, • the Portco Building (barrel storage), • the flare pit, and • refinery storage tanks.
Current Sources:	Impacted soil (secondary source). Existing pipelines from Fuel Loading Dock to Tank Farm (potential).
KNOWN ENVIRONMENTAL CONCERNS	
a. Soil	
Potential Contaminants of Concern:	PHCs, PAHs, salinity, metals
Proven Contaminants of Concern:	PHCs - BTEX, PHC F1 to F4G – in part due to natural seepage. Salinity – many of the SAR exceedances are associated with natural shallow bedrock conditions. PAHs – in part due to natural seepage.
Lateral Delineation:	PHC issues complicated due to the presence of natural crude oil and saline water seeps (Figure 6).
Vertical Delineation:	Vertical delineation of PHC complicated due to the presence of natural crude oil and saline water seeps.
b. Groundwater	
Potential Contaminants of Concern:	PHCs, phenols, PAHs, metals, salinity
Proven Contaminants of Concern:	PHCs - BTEX, PHC F1 to F2 Metals - close to background concentrations. Phenols - close to background concentrations for natural seepage. Salinity - close to background concentrations for natural seepage. PAHs - close to background concentrations for natural seepage.
Presence of Free Product:	LNAPL present at site.
Lateral Delineation:	PHC, salinity, and PAH issues complicated due to the presence of natural seeps. In general, facility-related light-end PHC issues are laterally delineated within an area approximately 90 m east-west and 80 m north-south (Figure 7).

Vertical Delineation:	Vertical delineation of PHC is complicated due to natural seeps in upper bedrock locally. Facility related PHCs are present in the first and second groundwater bearing zone wells in upper bedrock.

Migration Pathways and Receptors

MIGRATION PATHWAYS	Summarized in Figures 8 and 9. Potential pathways include leaching from soil to groundwater, lateral migration in groundwater, discharge to surface water, shallow vapour migration in soil, water and wind erosion.
RECEPTORS	Summarized in Figures 8 and 9. Main receptor of interest is the Mackenzie River, in relation to human, wildlife and freshwater aquatic life receptors. Plants and soil invertebrates may also be receptors in the rooting zone of shallow soils.
EXPOSURE PATHWAYS	Summarized in Figures 8 and 9.

Synopsis of Conceptual Risk

In terms of soil related exposure pathways, the remedial excavation completed in 1999 removed some PHC impacted soils underlying the 1998 pipeline leak of jet fuel. Other impacted soils remain in place. The remedial MPE and groundwater pumping systems (operational since 2003 but currently dormant due to the temporary field shutdown) have reduced free product thickness observed in soils and upper bedrock significantly. The remediation systems will resume operation when the Norman Wells facility restarts production. Due to physical obstacles to further excavation including the active pipeline right-of-way, steep slopes, the road bed and the high water table on the lower terrace beach area, some residual soil impacts exceeding PHC guidelines remain in place. Risks related to potential exposure pathways for human, ecological, microbial and wildlife contact or ingestion have been reduced by the remedial excavations and MPE system, but not eliminated.

The pathway for leaching from soil to groundwater is active. However, measured light-end PHC values, particularly benzene, toluene and ethylbenzene (BTE) in groundwater south of the mean high water mark (42.0 m elevation) generally do not exceed applied CCME fresh water aquatic guidelines.

In terms of groundwater related exposure pathways, Figure 7 indicates that PHCs exceeding one or more of the applied guidelines for BTE persist under the footprint of the 1998 pipeline leak, along the underground north-south pipeline corridor to the fuel loading dock, and in a portion of the lower terrace and beach area east of the dock. As such the exposure scenarios related to wildlife watering and freshwater aquatic life at the Mackenzie River are complete and active. In terms of groundwater consumption, the exposure scenario is incomplete for both humans and wildlife. Human drinking water is sourced locally from the Mackenzie River upstream of this site, and is treated by the Town of Norman Wells before use.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion.

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 400 m

1:8000

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	30-APR-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 1

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 17/5/2018 3:03:12 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 2:44:46 PM ISSUING OFFICE: eCAD



m 0 50 100 150 m

1:2500

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1979

Date:	Drawn by:	Edited by:	App'd by:
30-APR-18	BMF	-	

Advisian
WorleyParsons Group

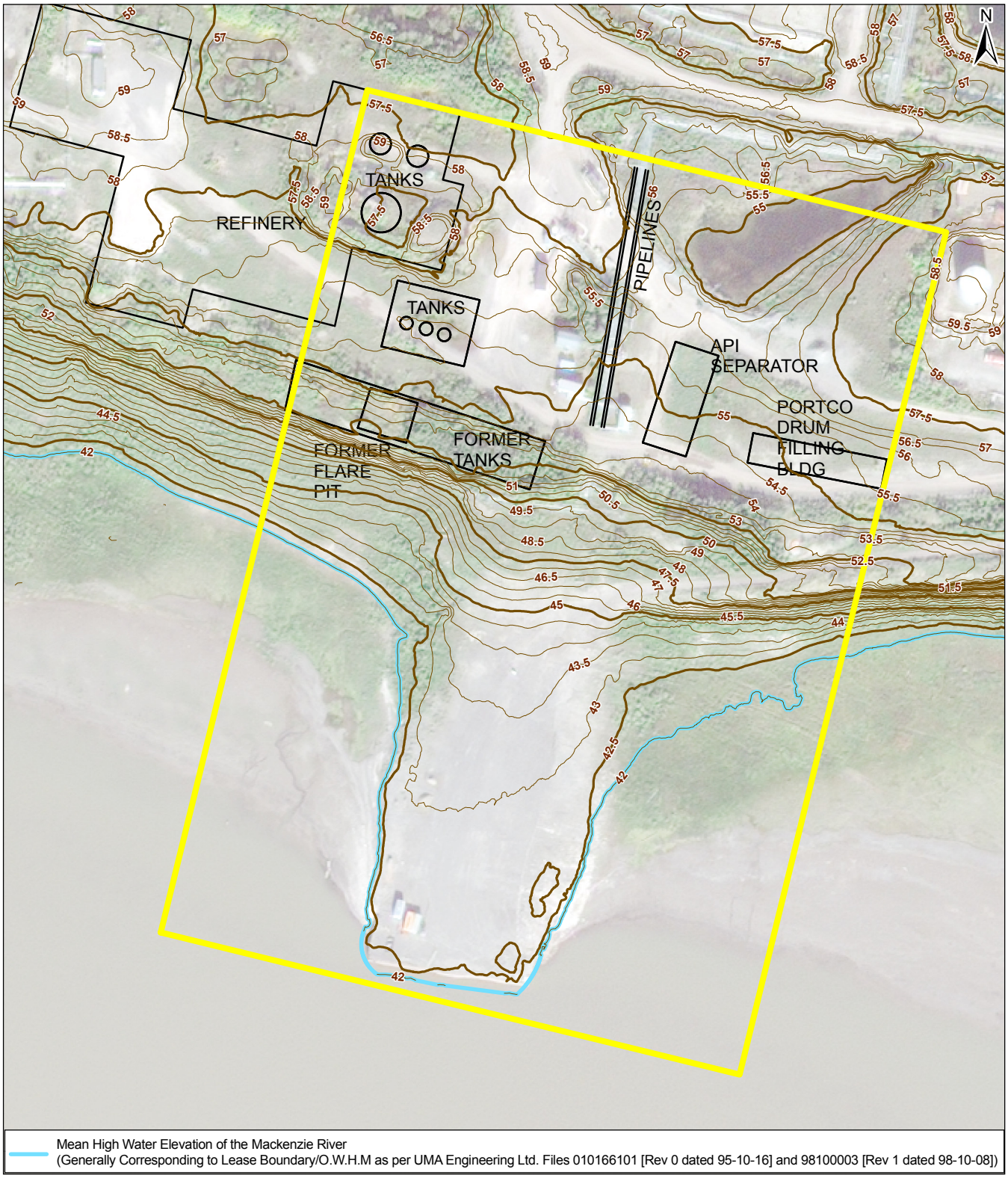
WorleyParsons Project No.
407011-00622-400

FIG No: 2
REV: A

*This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

PLOT DATE & TIME: 16/5/2018 1:49:35 PM
SAVE DATE & TIME: 15/5/2018 6:19:54 PM
USER NAME: blan.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-AIRPHOTO1979.DWG



Mean High Water Elevation of the Mackenzie River
(Generally Corresponding to Lease Boundary/O.W.H.M as per UMA Engineering Ltd. Files 010166101 [Rev 0 dated 95-10-16] and 98100003 [Rev 1 dated 98-10-08])

Site Boundary

Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 50 100
Metres
1:2,000

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	30-MAY-18	Drawn by:	T.G.	Edited by:	T.G.	App'd by:	D.G.

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 3

REV 0

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:52:43 PM
USER NAME: Tom.Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\Refinery Bank\RefineryBank_Topography_Rev0.mxd



LEGEND

- INJECTION WELL LOCATION
- SOIL SAMPLING LOCATION

HISTORICAL FEATURES SHOWN WITH WHITE OUTLINE

NOTE:
SOIL SAMPLING LOCATIONS PRIOR TO 2000 HAVE NOT BEEN SHOWN AS THE DATA IS NO LONGER CONSIDERED RELEVANT DUE TO 1) CHANGES IN SOIL ANALYTICAL METHODS, AND 2) THE EXTENSIVE IN SITU REMEDIAL PROGRAMS THAT HAVE OCCURRED SINCE THE EARLY 2000s.

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 m

1:750

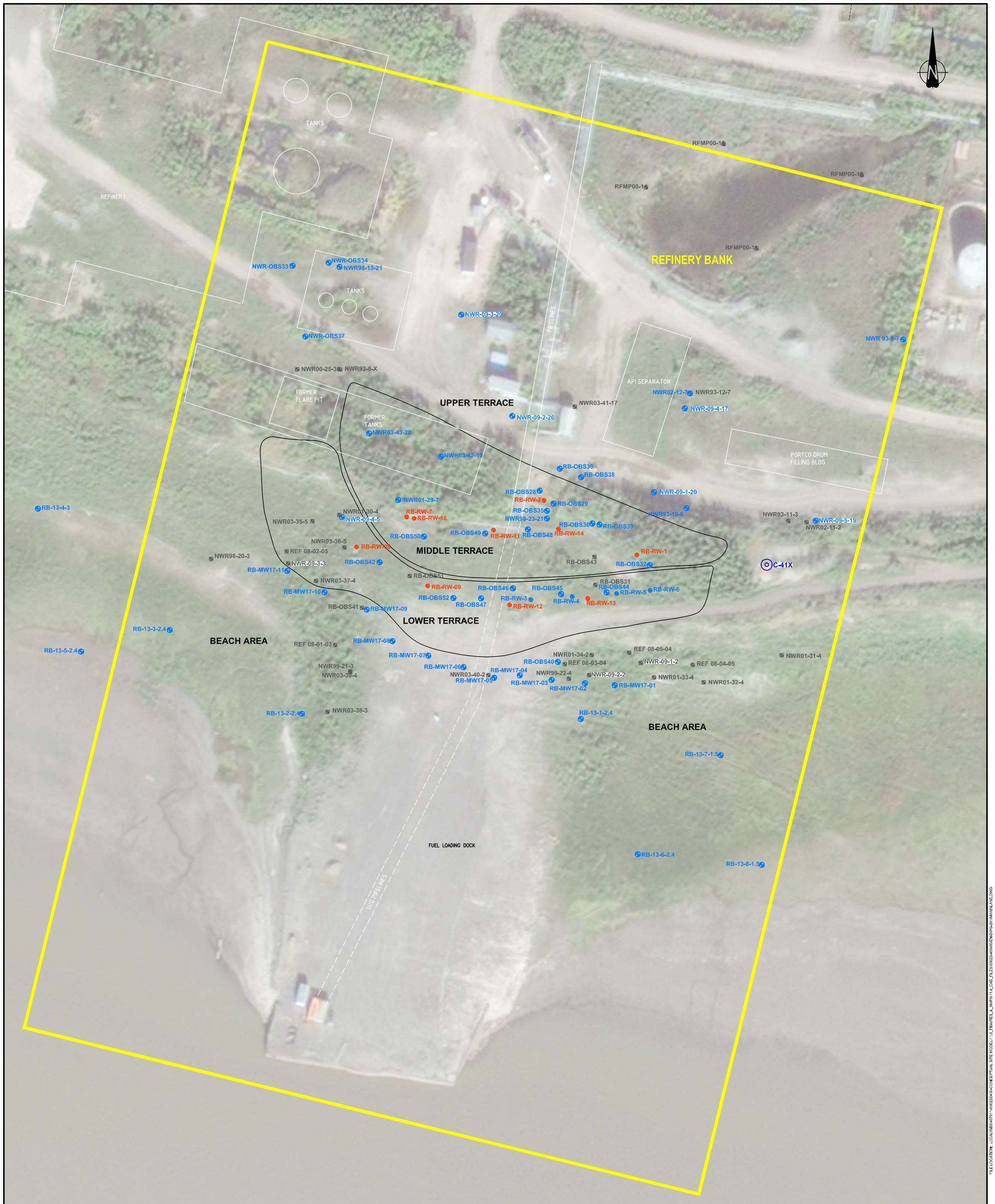
IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE PLAN SHOWING SOIL SAMPLING LOCATIONS

Date: 29-MAY-18	Drawn by: OTHERS	Edited by: BMF	App'd by: MB	
OneWay to zero harm	Advisian WorleyParsons Group	WorleyParsons Project No. 407011-00622-400		
		FIG No 4A	REV B	

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GIBS\407011-00622\400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-400-END-W5-20184MAINLAND.DWG
USER NAME: blak.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 29/5/2018 9:52:05 AM
SAVE DATE & TIME: 29/5/2018 9:43:27 AM



LEGEND

- INJECTION WELL LOCATION
- CURRENT MONITORING WELL LOCATION
- REMEDIATION RECOVERY WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION

HISTORICAL FEATURES SHOWN WITH WHITE OUTLINE

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 m

1:750

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE PLAN SHOWING GROUNDWATER SAMPLING LOCATIONS

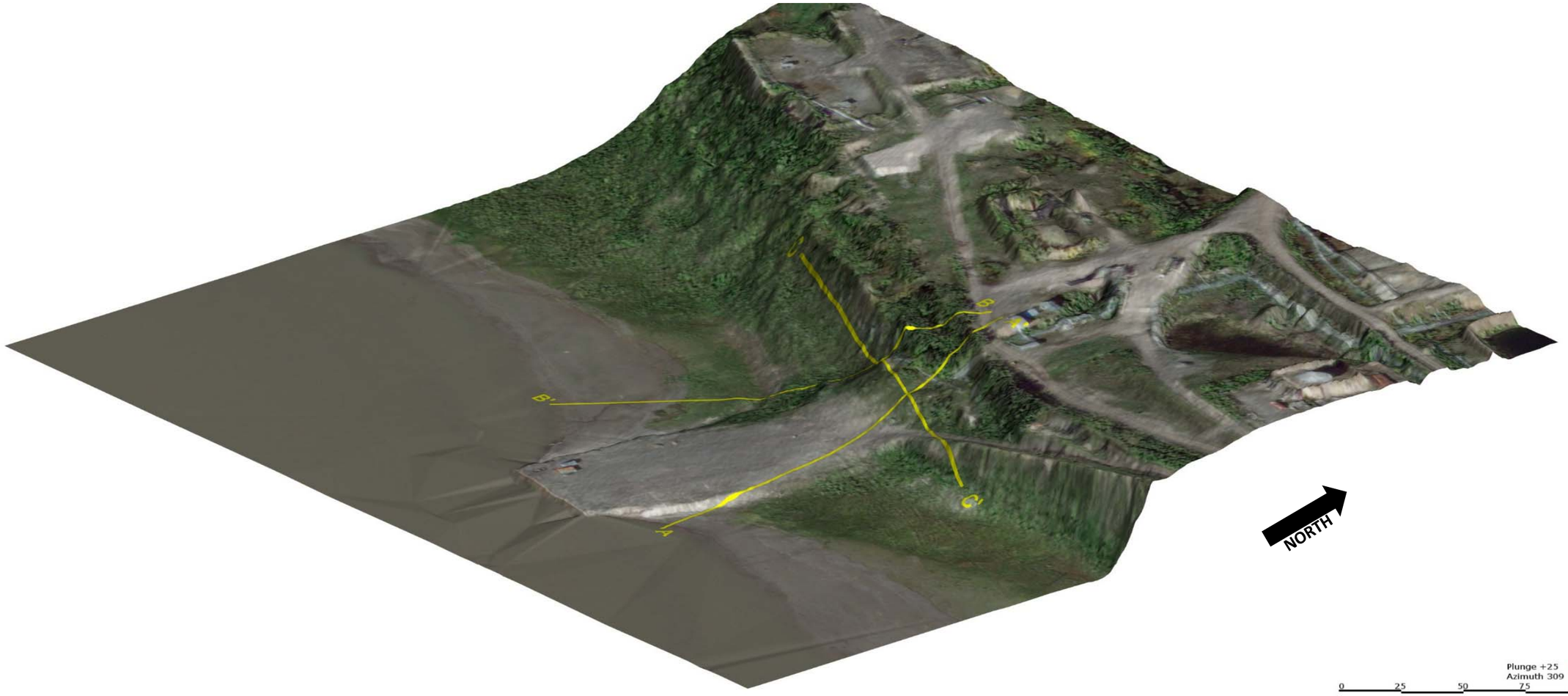
Date: 29-MAY-18	Drawn by: OTHERS	Edited by: BMF	App'd by: MB
		WorleyParsons Project No. 407011-00622-400	
		FIG No 4B	REV B

OneWay to zero harm

Advisian WorleyParsons Group

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-400-END\WS2018\4\MAINLAND.DWG
USER NAME: blak.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 29/5/2018 9:48:48 AM
SAVE DATE & TIME: 29/5/2018 9:43:27 AM



Unit

- CLAY
- COBBLES AND/OR GRAVEL
- NO SAMPLE
- SAND
- SANDSTONE
- SILT
- SILTSTONE/MUDSTONE/SHALE
- TOPSOIL/FILL/ORGANICS

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AM	DG	MB

OneWay™ to zero harm

Advision
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No. 5A

REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALIGBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURESREFINERY BANK



Unit

- CLAY
- COBBLES AND/OR GRAVEL
- NO SAMPLE
- SAND
- SANDSTONE
- SILT
- SILTSTONE/MUDSTONE/SHALE
- TOPSOIL/FILL/ORGANICS

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD PETROLEUM PARAMETERS EXCEEDING GUIDELINES, SHOWN IN RED

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD FREE-PHASE HYDROCARBONS, SHOWN IN PURPLE

Notes: 1) 3x vertical exaggeration
2) Cross-section width is 20 m.

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

CROSS-SECTION A-A' (NORTH TO SOUTHEAST)

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AM	DG	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No. 5B

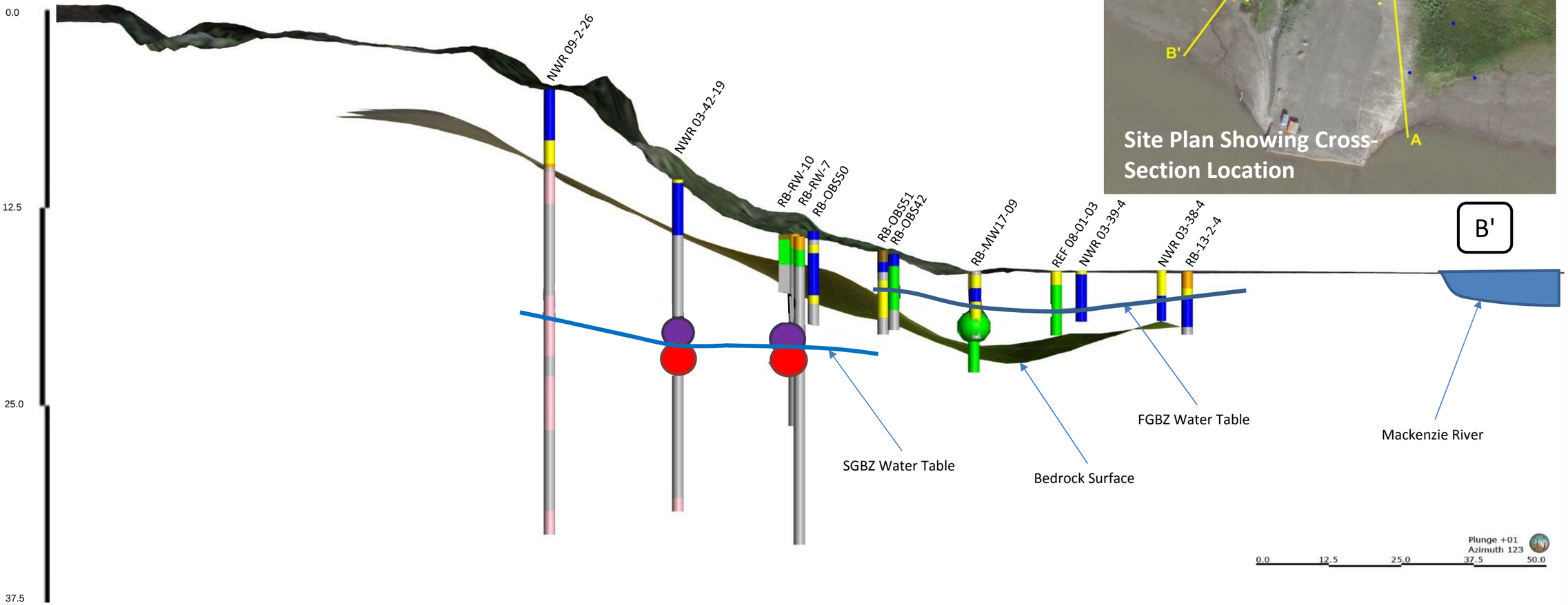
REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: I:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\REFINERY BANK

B





Unit

- CLAY
- COBBLES AND/OR GRAVEL
- NO SAMPLE
- SAND
- SANDSTONE
- SILT
- SILTSTONE/MUDSTONE/SHALE
- TOPSOIL/FILL/ORGANICS

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD PETROLEUM PARAMETERS BELOW GUIDELINES, SHOWN IN GREEN

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD PETROLEUM PARAMETERS EXCEEDING GUIDELINES, SHOWN IN RED

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD FREE-PHASE HYDROCARBONS, SHOWN IN PURPLE

Notes: 1) 3x vertical exaggeration
2) Cross-section width is 20 m.

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

CROSS-SECTION B-B' (NORTH TO SOUTHWEST)

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AM	DG	MB

OneWay to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622-400

FIG No.: 5C

REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALGBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\REFINERY BANK



C

C'

30 m

NWR 03-43-20
NWR 03-42-19
RB-OBS28
RB-RW-2
RB-OBS35
NWR 98-23-21
RB-RW-14
RB-OBS36
RB-OBS39
RB-OBS-43
RB-RW-1
RB-OBS32

+45

+30

Bedrock Surface

SGBZ Water Table

FGBZ Water Table

Plunge 00
Azimuth 025

0.0 12.5 25.0 37.5 50.0

Unit

- CLAY
- COBBLES AND/OR GRAVEL
- NO SAMPLE
- SAND
- SANDSTONE
- SILT
- SILTSTONE/MUDSTONE/SHALE
- TOPSOIL/FILL/ORGANICS

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD PETROLEUM PARAMETERS EXCEEDING GUIDELINES, SHOWN IN RED

LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD FREE-PHASE HYDROCARBONS, SHOWN IN PURPLE

Notes: 1) 3x vertical exaggeration
2) Cross-section width is 20 m.

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

CROSS-SECTION C-C' (NORTHWEST TO SOUTHEAST)

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AM	DG	MB

WorleyParsons Project No.: 407011-00622-400

FIG No.: 5D

REV: A

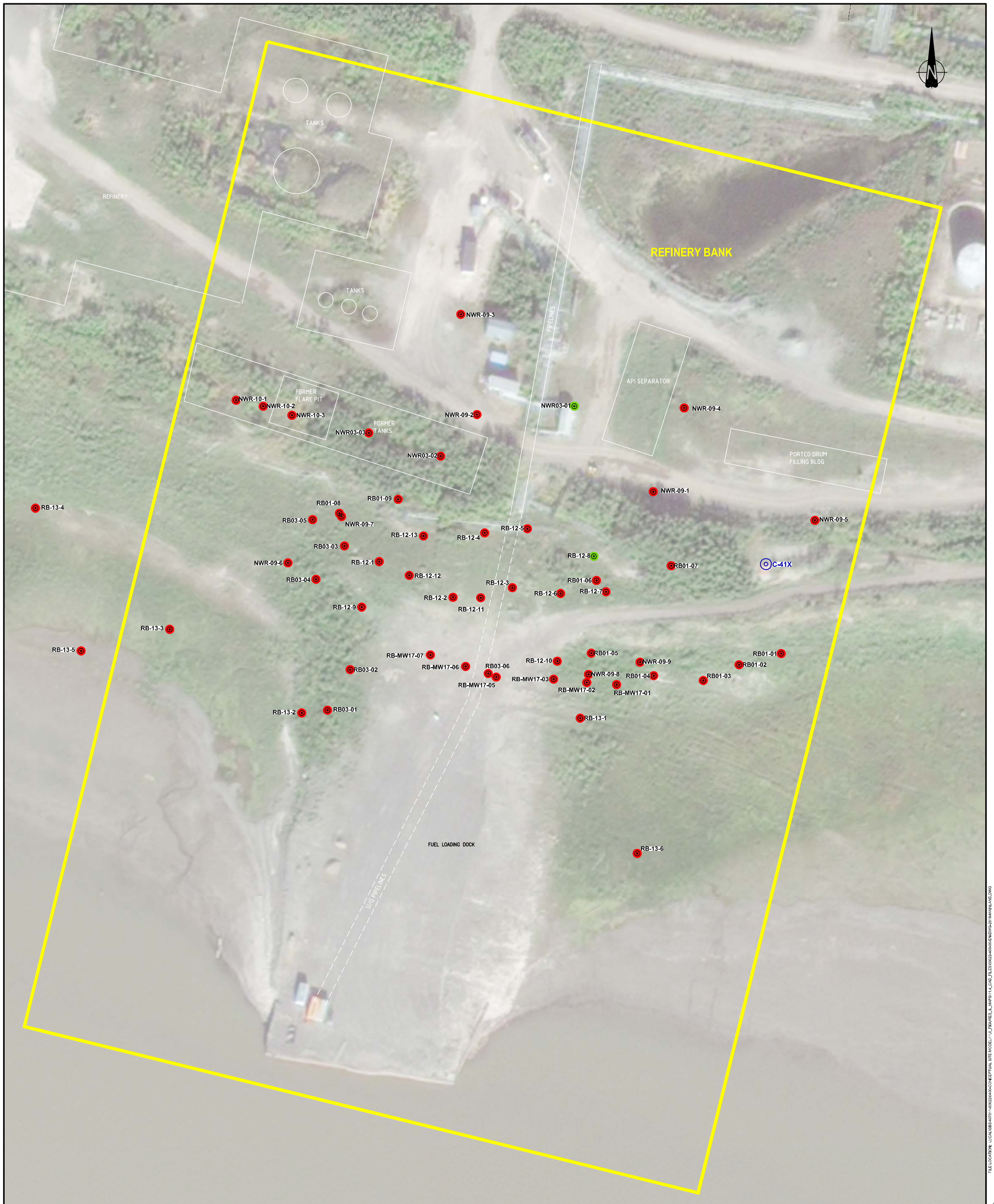
OneWay to zero harm

Advision
WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\REFINERY BANK



LEGEND

- INJECTION WELL LOCATION
- SOIL SAMPLING LOCATION

HISTORICAL FEATURES SHOWN WITH WHITE OUTLINE

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PETROLEUM HYDROCARBON (BTEX, F1 TO F4-G) PARAMETER THAT WAS ANALYZED, SHOWN IN RED

NOTE:
SOIL SAMPLING LOCATIONS PRIOR TO 2000 HAVE NOT BEEN SHOWN AS THE DATA IS NO LONGER CONSIDERED RELEVANT DUE TO 1) CHANGES IN SOIL ANALYTICAL METHODS, AND 2) THE EXTENSIVE IN SITU REMEDIAL PROGRAMS THAT HAVE OCCURRED SINCE THE EARLY 2000s.

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 m

1:750

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE PLAN SHOWING
SOIL PETROLEUM HYDROCARBON ANALYTICAL RESULTS

Date: 29-MAY-18	Drawn by: OTHERS	Edited by: BMF	App'd by: MB

OneWay to zero harm

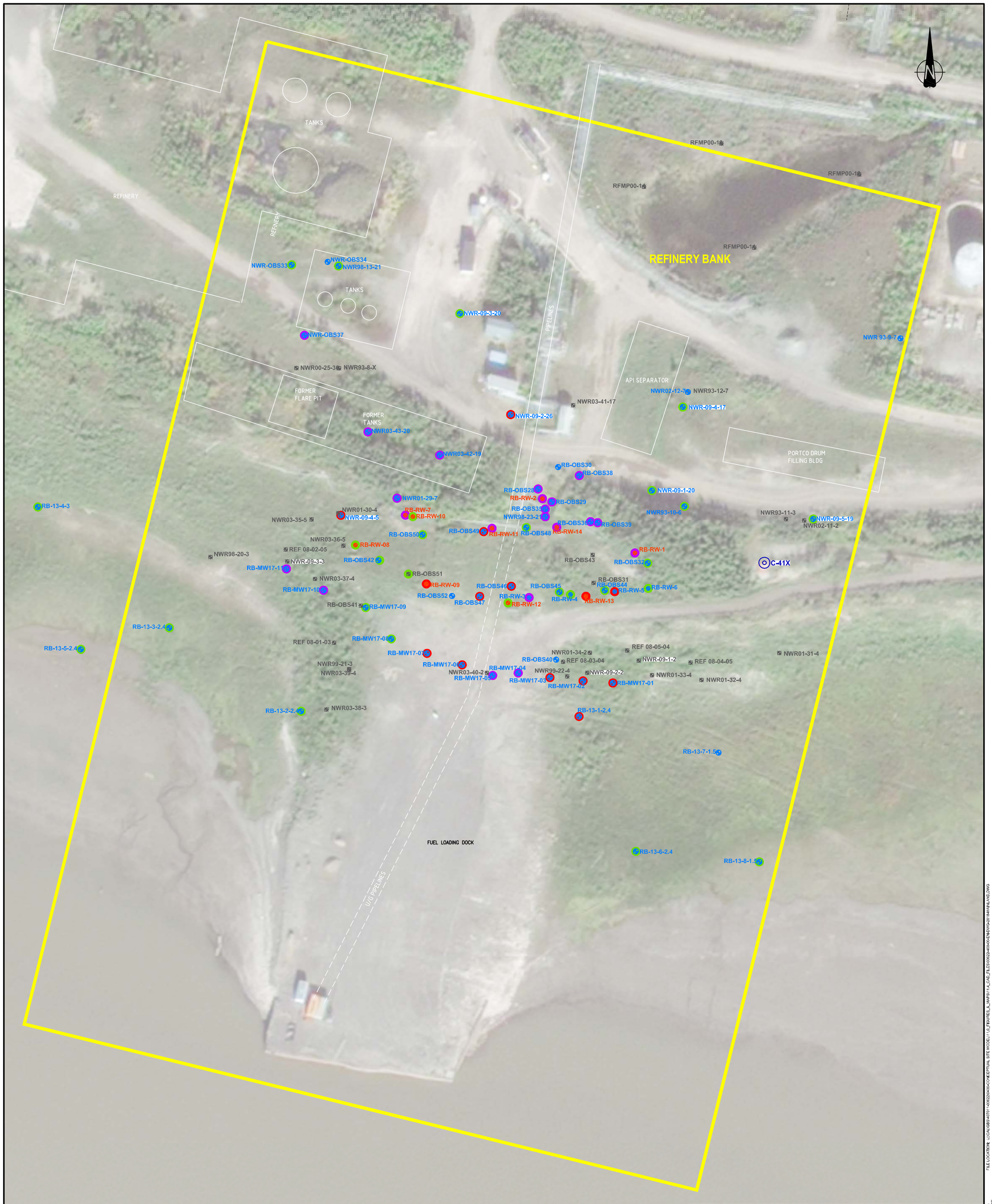
Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 6 | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GIBS\407011-00622\400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-400-END-W5-20184MAINLAND.DWG
PLOT DATE & TIME: 29/5/2018 9:52:43 AM
SAVE DATE & TIME: 29/5/2018 9:43:27 AM
USER NAME: blak.fink
ISSUING OFFICE: EDAD



LEGEND

- INJECTION WELL LOCATION
- CURRENT MONITORING WELL LOCATION
- REMEDIATION MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION

HISTORICAL FEATURES SHOWN WITH WHITE OUTLINE

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PETROLEUM HYDROCARBON PARAMETERS (BENZENE, TOLUENE, AND ETHYLBENZENE) THAT WERE ANALYZED BETWEEN 2015-2017, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PETROLEUM HYDROCARBON PARAMETER THAT WAS ANALYZED BETWEEN 2015-2017, SHOWN IN RED
- LOCATION WHERE MEASURABLE FREE PHASE WAS OBSERVED IN ONE OR MORE SAMPLING EVENTS BETWEEN 2015-2017, SHOWN IN PURPLE
- LOCATION NOT SAMPLED BETWEEN 2015-2017

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 m

1:750

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

SITE PLAN SHOWING
GROUNDWATER PETROLEUM HYDROCARBON ANALYTICAL RESULTS

OneWay to zero harm

Date: 29-MAY-18 | Drawn by: OTHERS | Edited by: BMF | App'd by: MB

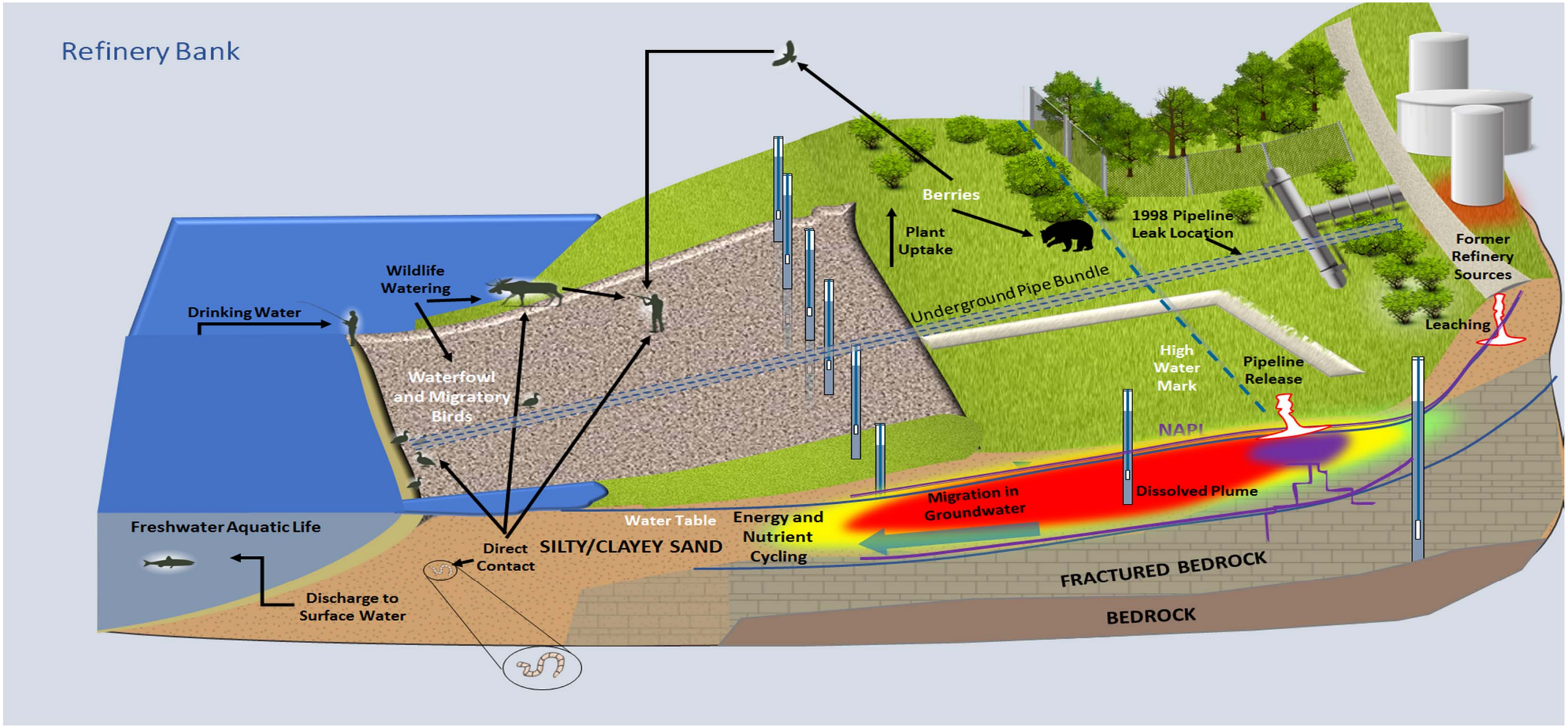
Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 7 | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-400-END-WG-201184AINLAND.DWG
USER NAME: blak.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 29/5/2018 9:58:44 AM
SAVE DATE & TIME: 29/5/2018 9:24:27 AM



Health Canada, 2015. Conceptual Site Model Builder, Version 1.0. Developed by eSolutions Group Ltd. 2015.

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL

Date: 16-May-18	Drawn by: AH	Edited by: DG	App'd by: MG

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

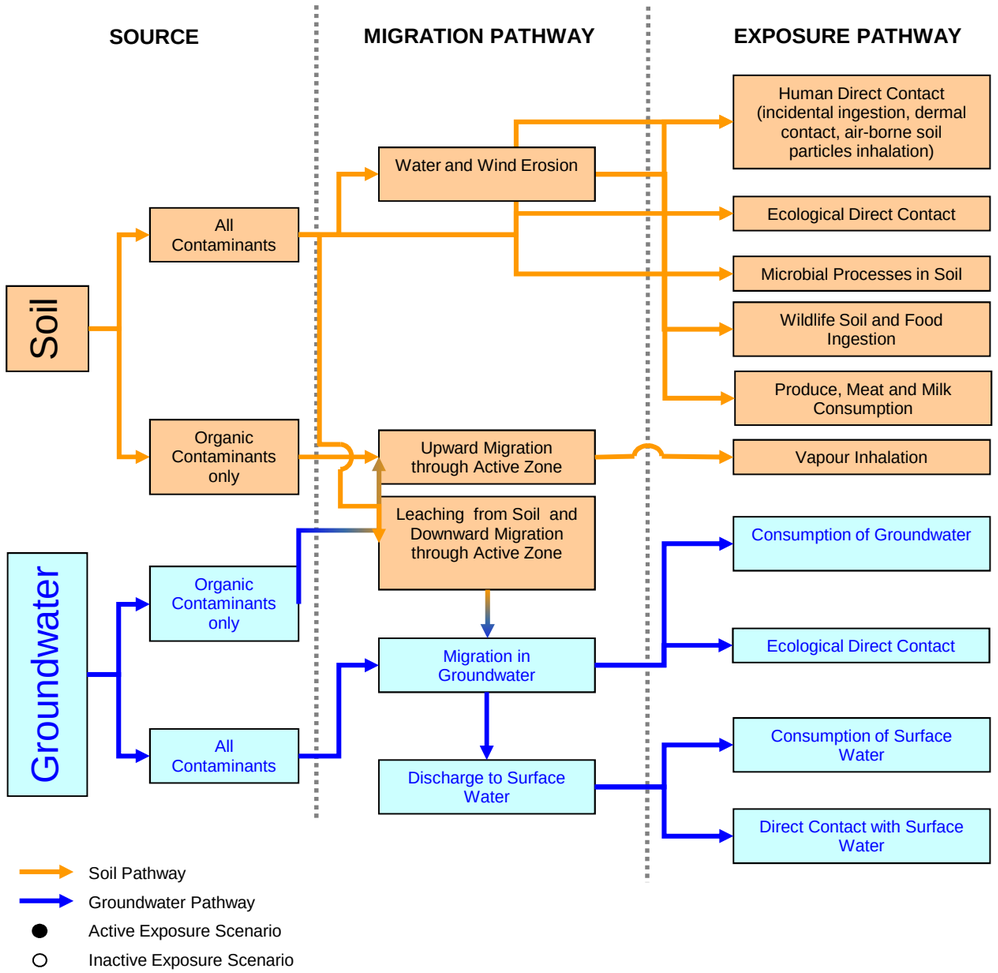
FIG No. 8 | REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CALIG\BS\

FILE DIRECTORY: CALGARY

Refinery Bank - Conceptual Exposure Model Flow Chart (Current Land Use and Site Conditions)



RECEPTORS			
Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
●			
		●	
		●	
	●		
●[1]			
○			
		●	
○	●		
			●

Notes: 1) Although the current land use is industrial, it is recognized that due to the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site, and hunters are able to hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
REFINERY BANK, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

OneWay™ to zero harm

Date: 16-May-18 | Drawn by: AH | Edited by: LG | App'd by: MB

Advision WorleyParsons Group

WorleyParsons Project No. 407011-00622

FIG No. 9 | REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY
FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BT3

Tables



Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Coarse Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Coarse Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
NWR-09-1	21-Aug-2009	0.0 - 0.3m	1.9	1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2009	0.5 - 0.8m	0.38	0.6	---	< 1	4	140	< 0.4	0.2	20	< 0.15	4	8	13	< 0.05	1.7	16	< 0.5	< 1	< 0.3	< 1	< 1	14	35
	21-Aug-2009	3.5 - 3.8m	0.27	0.7	---	< 1	10	140	0.4	< 0.1	24	< 0.15	12	15	8	0.06	< 0.4	36	< 0.5	< 1	< 0.3	< 1	< 1	35	89
	21-Aug-2009	5.8 - 6.1m	1.4	0.3	---	< 1	**15** [#2]	97	0.5	< 0.1	25	< 0.15	13	17	8	0.08	< 0.4	39	< 0.5	< 1	< 0.3	< 1	< 1	35	91
NWR-09-2	03-Aug-2009	0.4 - 0.7m	0.82	0.3	---	1	10	190	< 0.4	0.5	19	< 0.15	8	18	16	0.06	6.4	33	0.9	< 1	0.5	< 1	1	22	89
	03-Aug-2009	0.9 - 1.2m	2.6	0.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	2.1 - 2.4m	0.53	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	5.7 - 6.0m	0.82	2.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-3	04-Aug-2009	0.0 - 0.3m	2.7	0.5	---	< 1	**15** [#1]	200	< 0.4	0.5	18	< 0.15	9	25	34	0.06	26	40	2.0	< 1	**1.4** [#1]	< 1	3	34	92
	04-Aug-2009	1.2 - 1.5m	0.75	0.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2009	4.8 - 5.1m	0.82	8.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-4	03-Aug-2009	0.0 - 0.3m	0.48	0.6	---	< 1	7	270	< 0.4	0.5	14	< 0.15	8	18	10	< 0.05	2.8	26	0.7	< 1	< 0.3	< 1	< 1	22	79
	03-Aug-2009	0.9 - 1.2m	1	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	2.7 - 3.0m	0.45	3.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	4.0 - 4.3m	0.55	1.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	4.5 - 4.8m	0.46	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	7.2 - 7.5m	0.42	1.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-5	03-Aug-2009	0.0 - 0.6m	0.49	0.4	---	< 1	5	170	< 0.4	0.2	12	< 0.15	4	10	20	0.05	1.9	14	< 0.5	< 1	< 0.3	< 1	< 1	12	41
	03-Aug-2009	1.0 - 1.3m	0.52	0.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-6	05-Aug-2009	0.0 - 0.3m	0.36	0.5	---	< 1	**12** [#1]	190	< 0.4	0.2	19	< 0.15	8	12	13	0.06	1.0	26	< 0.5	< 1	< 0.3	< 1	< 1	34	67
	05-Aug-2009	0.9 - 1.2m	0.24	1.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	2.7 - 3.0m	0.57	2.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-7	05-Aug-2009	0.0 - 0.3m	0.32	0.5	---	< 1	**17** [#1]	110	0.5	0.1	24	< 0.15	12	14	16	< 0.05	1.6	37	1.0	< 1	< 0.3	1	< 1	45	86
	05-Aug-2009	1.2 - 1.5m	0.26	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	3.0 - 3.3m	0.9	5.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-8	05-Aug-2009	0.0 - 0.3m	0.87	0.3	---	< 1	9	320	< 0.4	0.5	15	< 0.15	8	17	12	< 0.05	5.9	27	0.8	< 1	0.4	< 1	1	30	81
	05-Aug-2009	0.6 - 0.9m	0.48	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	1.5 - 1.8m	0.99	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	2.1 - 2.4m	0.5	1.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Coarse Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Coarse Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
NWR-09-9	05-Aug-2009	0.0 - 0.3m	0.87	0.6	---	< 1	8	310	< 0.4	0.4	15	< 0.15	8	15	10	< 0.05	2.7	24	< 0.5	< 1	< 0.3	< 1	< 1	25	75
	05-Aug-2009	1.2 - 1.5m	0.56	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	1.5 - 1.8m	1.2	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	2.7 - 3.0m	0.86	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-10-1	21-Aug-2010	0.0 - 0.5m	3.3	0.7	---	< 1	**14** [#1]	260	< 0.4	0.5	25	< 0.15	10	23	32	< 0.05	15	45	1.0	< 1	0.9	< 1	2	57	120
	21-Aug-2010	1.5 - 2.0m	0.37	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-10-2	21-Aug-2010	0.0 - 0.5m	2.7	0.4	---	< 1	**15** [#1]	230	< 0.4	0.4	32	< 0.15	12	36	11	0.14	16	50	0.8	< 1	0.5	< 1	2	73	100
	21-Aug-2010	0.5 - 1.0m	1.5	1.6	---	< 1	**14** [#1]	260	0.5	0.2	39	< 0.15	10	12	11	< 0.05	6.4	37	< 0.5	< 1	< 0.3	< 1	1	77	81
	21-Aug-2010	1.5 - 2.0m	0.85	1.1	---	< 1	5	230	< 0.4	0.4	15	< 0.15	7	13	10	< 0.05	0.9	22	< 0.5	< 1	< 0.3	< 1	< 1	27	60
NWR-10-3	21-Aug-2010	0.0 - 0.5m	1.4	0.3	---	1	**14** [#1]	250	< 0.4	0.6	23	< 0.15	11	23	18	0.11	21	51	1.7	< 1	**1.3** [#1]	< 1	3	59	210
RB-13-1	05-Sep-2013	1.2 - 1.5m	0.36	**13** [#1]	7.25	< 1.0	7.6	220	< 0.40	0.29	19	< 0.15	6.8	13	11	0.081	1.4	24	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	28	69
	05-Sep-2013	2.0 - 2.5m	0.43	8.4	7.70	1.6	**24** [#1]	84	2.6	1.5	40	< 0.15	19	25	12	0.059	1.8	57	1.6	< 1.0	**1.5** [#1]	1.8	1.8	54	140
(Duplicate)	05-Sep-2013	2.0 - 2.5m	0.49	8.4	7.65	< 1.0	**20** [#1]	74	0.83	< 0.10	35	< 0.15	17	23	9.9	0.064	< 0.40	54	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	49	130
	05-Sep-2013	3.6 - 3.9m	0.37	9.6	7.82	< 1.0	**27** [#2]	160	0.86	< 0.10	38	< 0.15	18	24	9.4	0.065	< 0.40	57	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	52	140
RB-13-2	06-Sep-2013	0.3 - 0.6m	1.6	0.41	7.54	< 1.0	9.2	240	0.51	0.53	24	< 0.15	8.0	20	8.3	0.074	9.1	35	1.4	< 1.0	0.45	< 1.0	2.8	37	87
	06-Sep-2013	1.2 - 1.5m	0.70	**26** [#1]	7.42	< 1.0	11	200	< 0.40	0.27	23	< 0.15	8.0	16	17	0.063	2.0	28	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	27	77
	06-Sep-2013	2.7 - 3.0m	0.57	**24** [#1]	7.28	< 1.0	12 [#1]	280	0.91	0.28	32	< 0.15	15	32	13	0.090	0.85	46	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	44	120
	06-Sep-2013	3.4 - 3.7m	0.42	< 0.10	**8.23** [#2]	< 1.0	**24** [#2]	370	1.0	< 0.10	40	< 0.15	20	47	14	0.061	< 0.40	61	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	51	160
RB-13-3	06-Sep-2013	0.3 - 0.6m	1.1	6.2	7.31	< 1.0	10	330	0.54	0.62	18	< 0.15	11	23	9.4	0.051	2.5	33	0.73	< 1.0	< 0.30	< 1.0	< 1.0	30	110
	06-Sep-2013	1.2 - 1.5m	0.57	< 0.10	7.52	< 1.0	11	160	0.73	< 0.10	30	< 0.15	16	38	9.9	< 0.050	< 0.40	50	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	37	130
	06-Sep-2013	2.2 - 2.5m	0.58	**26** [#1]	**8.62** [#1]	< 1.0	10	340	0.99	< 0.10	34	< 0.15	18	44	11	< 0.050	< 0.40	56	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	40	150
	06-Sep-2013	3.3 - 3.6m	0.52	**22** [#2]	**8.87** [#2]	< 1.0	9.3	340	1.1	< 0.10	36	< 0.15	19	46	11	0.091	< 0.40	57	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	44	140
RB-13-4	06-Sep-2013	0.0 - 0.3m	1.5	**13** [#1]	7.79	< 1.0	11	240	0.46	0.36	24	< 0.15	8.7	18	9.5	0.15	1.7	30	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	28	85
	06-Sep-2013	2.9 - 3.0m	2.2	**27** [#1]	**10.8** [#1]	< 1.0	6.1	210	< 0.40	0.11	16	< 0.15	4.7	11	3.1	< 0.050	1.4	15	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	20	34
	06-Sep-2013	3.0 - 3.3m	1.6	**42** [#2]	**10.5** [#2]	< 1.0	11	310	0.91	< 0.10	40	< 0.15	16	38	9.7	0.078	0.88	51	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	41	120
RB-13-5	06-Sep-2013	0.0 - 0.3m	2.6	0.71	7.53	< 1.0	9.4	330	0.49	0.58	17	< 0.15	9.5	20	8.6	0.065	2.2	29	0.70	< 1.0	< 0.30	< 1.0	< 1.0	28	98
	06-Sep-2013	1.0 - 1.5m	0.75	4.5	7.37	< 1.0	9.9	270	0.55	0.57	19	< 0.15	11	23	9.5	0.077	2.2	33	0.69	< 1.0	< 0.30	< 1.0	< 1.0	29	100
(Duplicate)	06-Sep-2013	1.0 - 1.5m	0.82	4.1	7.03	< 1.0	9.4	280	0.51	0.62	16	< 0.15	9.5	21	9.2	0.092	2.1	29	0.75	< 1.0	< 0.30	< 1.0	< 1.0	28	98
	06-Sep-2013	2.2 - 2.5m	0.53	**24** [#1]	7.74	< 1.0	11	180	0.78	< 0.10	31	< 0.15	16	40	11	< 0.050	0.42	50	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	39	120
RB-13-6	09-Sep-2013	0.0 - 0.5m	1.5	**18** [#1]	7.17	< 1.0	8.7	280	0.48	0.50	16	< 0.15	7.7	17	7.8	< 0.050	2.3	27	0.65	< 1.0	< 0.30	< 1.0	< 1.0	26	89
	09-Sep-2013	1.0 - 1.6m	0.92	**16** [#1]	7.12	< 1.0	8.5	270	< 0.40	0.47	14	< 0.15	7.4	17	7.6	< 0.050	2.1	25	0.59	< 1.0	< 0.30	< 1.0	< 1.0	25	85
	09-Sep-2013	1.7 - 2.1m	0.81	**17** [#1]	7.08	< 1.0	8.7	250	< 0.40	0.44	16	< 0.15	6.8	16	52	0.26	1.4	23	0.51	< 1.0	< 0.30	< 1.0	< 1.0	24	120
RB-MW17-02	12-Jun-2017	1.5 - 2.0m	0.50	1.0	7.65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jun-2017	2.6 - 3.0m	0.36	1.5	7.72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1
Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Coarse Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Coarse Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
RB-MW17-05	13-Jun-2017	3.0 - 3.5m	0.45	0.80	7.82	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	13-Jun-2017	3.0 - 3.5m	0.54	0.85	7.65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	4.0 - 4.5m	0.41	3.3	7.82	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-07	22-Jun-2001	5.0 - 6.0m	0.723	0.74	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-08	24-Jun-2001	1.5 - 3.0m	0.329	0.58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	4.5 - 6.0m	0.279	1.28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-09	24-Jun-2001	1.0 - 1.5m	0.174	1.12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	3.0 - 4.5m	0.966	**15.3 [#2]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-04	12-Jul-2003	0.0 - 1.5m	---	---	---	---	---	---	---	---	---	---	---	---	22.9	---	---	---	---	---	---	---	---	---	---
RB03-05	12-Jul-2003	0.0 - 1.5m	---	---	---	---	---	---	---	---	---	---	---	---	34.6	---	---	---	---	---	---	---	---	---	---
RB03-06	12-Jul-2003	1.5 - 3.0m	---	---	---	---	---	---	---	---	---	---	---	---	25.1	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Coarse-grained Surface soils, 1999 and updates)
8. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Coarse-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Borehole Name	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Coarse Surface [#1]			1.0	0.1	50	37	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	10	10	180	0.25	10	1	0.013	0.046	100
CCME Industrial Coarse Sub-Surface [#2]			1.0	0.1	50	37	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	10	10	180	0.25	10	1	0.013	0.046	100
CCME PHC in Soil Ind Coarse Surface [#3]			---	---	---	---	320	260	1700	3300	3300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Ind Coarse Sub-Surface [#4]			---	---	---	---	700	380	3500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
UNSPECIFIED																												
NWR-09-1	21-Aug-2009	0.0 - 0.3m	0.062	0.036	0.070	1.3	140	320 [#3]	3500 [#3]	---	7100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2009	0.5 - 0.8m	0.34	< 0.020	0.080	14	770 [#3]	2000 [#3]	3500 [#3]	---	4900 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2009	2.7 - 3.0m	2.8 [#1]	3.2 [#1]	28	150 [#1]	3700 [#3]	14000 [#3]	3500 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2009	3.5 - 3.8m	0.096	0.10 [#2]	0.49	2.9	140	810 [#4]	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2009	5.8 - 6.1m	0.024	0.079	0.066	0.40	24	150	250	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-2	03-Aug-2009	0.4 - 0.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	70	1200	---	1900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	0.9 - 1.2m	0.48	0.045	0.17	0.24	240	1100 [#3]	1100	---	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	2.1 - 2.4m	77 [#1]	240 [#1]	48	300 [#1]	2200 [#3]	7300 [#3]	670	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	5.7 - 6.0m	0.76	1.9 [#2]	1.4	6.8	110	480 [#4]	510	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	7.2 - 7.5m	1.3 [#2]	1.9 [#2]	1.5	9.2	120	340	290	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-3	04-Aug-2009	0.0 - 0.3m	0.024	0.059	0.035	0.25	480 [#3]	840 [#3]	4800 [#3]	---	6400 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2009	0.3 - 0.6m	2.9 [#1]	0.24 [#1]	3.1	10	5100 [#3]	2100 [#3]	6900 [#3]	---	8900 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2009	1.2 - 1.5m	43 [#1]	140 [#1]	18	150 [#1]	42000 [#3]	1300 [#3]	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2009	4.8 - 5.1m	8.5 [#2]	18 [#2]	5.5	27	1600 [#4]	350	210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2009	7.2 - 7.5m	3.0 [#2]	5.9 [#2]	1.8	10	620	170	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-4	03-Aug-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	100	18	95	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	2.7 - 3.0m	0.013	< 0.020	< 0.010	< 0.040	29	24	58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	4.5 - 4.8m	0.012	< 0.020	< 0.010	< 0.040	41	420 [#4]	780	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-5	03-Aug-2009	0.0 - 0.6m	< 0.0050	0.036	0.012	< 0.040	54	1100 [#3]	4300 [#3]	---	6100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	1.0 - 1.3m	< 0.0050	0.032	< 0.010	< 0.040	210	16	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2009	6.7 - 7.5m	0.023	0.079	0.068	0.60	110	550 [#4]	950	---	980	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-6	05-Aug-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	57	1400	---	2700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	0.3 - 0.6m	0.19	< 0.020	0.042	0.45	1900 [#3]	4600 [#3]	5800 [#3]	---	6700 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	0.9 - 1.2m	2.9 [#1]	0.042	0.19	4.4	2000 [#3]	2500 [#3]	3400 [#3]	---	6000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	2.7 - 3.0m	1.6 [#1]	0.061	0.61	17	860 [#3]	3600 [#3]	6900 [#3]	---	10000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-7	05-Aug-2009	0.0 - 0.3m	0.014	< 0.020	0.018	0.20	32	600 [#3]	2800 [#3]	---	4500 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	1.2 - 1.5m	0.026	0.036	0.017	0.19	350 [#3]	3100 [#3]	3200 [#3]	---	3500 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	3.0 - 3.3m	0.12	0.22 [#1]	0.42	3.7	430	1300 [#3]	1800 [#3]	---	2600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-8	05-Aug-2009	0.0 - 0.3m	0.050	< 0.020	< 0.010	0.22	460 [#3]	130	1300	---	2600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	0.6 - 0.9m	1.6 [#1]	0.054	0.19	53 [#1]	4200 [#3]	26000 [#3]	18000 [#3]	---	22000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	1.5 - 1.8m	5.1 [#1]	0.29 [#1]	15	82 [#1]	5300 [#3]	5200 [#3]	3300 [#3]	---	2700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	2.1 - 2.4m	3.1 [#1]	0.16 [#1]	1.4	33	3000 [#3]	3200 [#3]	2000 [#3]	---	1200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Borehole Name	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH															
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Coarse Surface [#1]			**1.0**	**0.1**	**50**	**37**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Coarse Sub-Surface [#2]			**1.0**	**0.1**	**50**	**37**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**0.013**	**0.046**	**100**
CCME PHC in Soil Ind Coarse Surface [#3]			---	---	---	---	**320**	**260**	**1700**	**3300**	**3300**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Ind Coarse Sub-Surface [#4]			---	---	---	---	**700**	**380**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-09-9	05-Aug-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	1.2 - 1.5m	0.047	0.024	0.071	0.11	< 12	260 [#3]	610	---	610	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	1.5 - 1.8m	**4.0** [#1]	**4.7** [#1]	14	**59** [#1]	**3900** [#3]	**4600** [#3]	**3900** [#3]	---	**3700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2009	2.7 - 3.0m	**2.9** [#1]	**0.80** [#1]	9.2	**57** [#1]	**2900** [#3]	**4400** [#3]	**4500** [#3]	---	**5400** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-10-1	21-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	40	170	---	---	**0.43** [#1]	0.099	< 0.0040	0.0063	< 0.0050	< 0.1	0.0093	< 0.0050	< 0.0050	0.021	**1.2** [#1]	< 0.0050	0.23	**8.2** [#1]	**2.0** [#1]	0.063
	21-Aug-2010	1.5 - 2.0m	**21** [#1]	**120** [#1]	34	**140** [#1]	**6100** [#3]	**5700** [#3]	**2300** [#3]	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.1	0.0062	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.066	0.010	0.023	< 0.0050
(Duplicate)	21-Aug-2010	1.5 - 2.0m	---	---	---	---	---	---	---	---	---	**0.48** [#2]	0.10	< 0.0040	< 0.0050	< 0.0050	< 0.1	0.0083	< 0.0050	< 0.0050	0.021	**1.1** [#2]	< 0.0050	0.19	**8.6** [#2]	**2.0** [#2]	0.061
	21-Aug-2010	3.0 - 3.5m	**100** [#2]	**600** [#2]	**180** [#2]	**880** [#2]	**22000** [#4]	**3300** [#4]	**2300** [#3]	---	2100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	3.9 - 4.4m	**8.0** [#2]	**28** [#2]	**32**	**140** [#2]	**3100** [#4]	**1200** [#4]	1300	---	810	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-10-2	21-Aug-2010	0.0 - 0.5m	0.022	0.036	0.073	0.14	28	**1300** [#3]	1100	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.1	0.0078	< 0.0050	< 0.0050	0.009	0.057	< 0.0050	0.15	**0.23** [#1]	**0.21** [#1]	0.039
	21-Aug-2010	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**1300** [#3]	960	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	1.5 - 2.0m	0.60	**0.55** [#1]	0.76	**44** [#1]	**5100** [#3]	**5200** [#3]	**1900** [#3]	---	1200	**0.43** [#1]	0.11	< 0.0040	0.012	< 0.0050	< 0.1	0.0094	< 0.0050	< 0.0050	0.038	**1.2** [#1]	< 0.0050	0.22	**6.1** [#1]	**1.5** [#1]	0.063
	21-Aug-2010	4.0 - 4.5m	0.61	**0.37** [#2]	0.19	6.5	200	**1600** [#4]	2900	---	3500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	5.5 - 6.0m	0.45	**0.42** [#2]	1.3	14	500	**1600** [#4]	3000	---	4400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2010	7.0 - 7.5m	0.73	**0.46** [#2]	0.31	5.7	300	**1100** [#4]	33	---	2900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR-10-3	21-Aug-2010	0.0 - 0.5m	0.01	< 0.020	0.029	0.19	< 12	87	700	---	980	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.1	0.0080	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.16	**0.021** [#1]	**0.089** [#1]	0.018
	21-Aug-2010	1.5 - 2.0m	**29** [#1]	**29** [#1]	**73** [#1]	**310** [#1]	**10000** [#3]	**3200** [#3]	**1900** [#3]	---	1200	< 0.19	0.04	< 0.0040	< 0.0050	< 0.0050	< 0.1	0.0097	< 0.0050	< 0.0050	0.017	**0.56** [#1]	< 0.0050	0.26	**4.1** [#1]	**1.1** [#1]	0.061
	21-Aug-2010	3.9 - 4.4m	0.28	0.091	0.14	7.6	660	**2700** [#3]	3500 [#3]	---	**4600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR03-01	15-Jul-2003	0.0 - 1.5m	0.10	< 0.10 [#1]	< 0.10	< 0.1	23	230	530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2003	1.5 - 3.0m	0.13	< 0.10 [#1]	< 0.10	< 0.1	26	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR03-02	14-Jul-2003	0.0 - 1.5m	0.46	0.37 [#1]	2.0	14	**2000** [#3]	**14000** [#3]	**10000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2003	1.5 - 3.0m	0.06	**0.13** [#1]	0.24	4.0	**730** [#3]	**3700** [#3]	**3300** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR03-03	13-Jul-2003	0.0 - 1.5m	**1.7** [#1]	**0.34** [#1]	4.8	5.31	130	30	37	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2003	1.5 - 3.0m	**1.6** [#1]	**1.1** [#2]	9.2	28	**550** [#3]	**300** [#3]	1500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2003	3.0 - 4.5m	0.18	< 0.10 [#2]	0.24	6.5	330	**1600** [#4]	3400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-1	26-Jul-2012	2.2 - 2.5m	0.036	0.029	0.12	0.26	< 12	200	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Jul-2012	2.5 - 3.3m	0.064	**0.21** [#1]	0.20	2.6	**3000** [#3]	**3900** [#3]	**2300** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	26-Jul-2012	2.5 - 3.3m	0.084	0.10 [#1]	0.18	1.3	**1500** [#3]	**4200** [#3]	**2800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-2	28-Jul-2012	2.0 - 2.5m	< 0.51	**0.55** [#1]	0.52	**70** [#1]	**4700** [#3]	**3600** [#3]	**2500** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	3.6 - 4.1m	**8.0** [#2]	**0.32** [#2]	1.4	36	**5500** [#4]	**4800** [#4]	2900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-3	27-Jul-2012	2.25 - 2.75m	0.072	**0.10** [#1]	0.13	11	**4000** [#3]	**17000** [#3]	**6800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	3.9 - 4.2m	**6.6** [#2]	< 0.17 [#2]	0.56	31	**5400** [#4]	**9200** [#4]	**3900** [#4]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Borehole Name	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Coarse Surface [#1]			**1.0**	**0.1**	**50**	**37**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Coarse Sub-Surface [#2]			**1.0**	**0.1**	**50**	**37**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**0.013**	**0.046**	**100**
CCME PHC in Soil Ind Coarse Surface [#3]			---	---	---	---	**320**	**260**	**1700**	**3300**	**3300**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Ind Coarse Sub-Surface [#4]			---	---	---	---	**700**	**380**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-4	28-Jul-2012	2.0 - 2.5m	< 0.11	**0.25** [#1]	10	**82** [#1]	**7100** [#3]	**5500** [#3]	**2800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Jul-2012	2.0 - 2.5m	0.056	**0.12** [#1]	1.8	17	**3600** [#3]	**4000** [#3]	**1900** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	3.5 - 3.7m	0.74	**0.18** [#2]	5.1	**50** [#2]	**4200** [#4]	**2400** [#4]	810	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-5	28-Jul-2012	1.75 - 2.0m	0.71	0.035	2.2	21	**3400** [#3]	**9800** [#3]	**4700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	3.5 - 3.8m	**4.9** [#2]	**7.5** [#2]	2.8	**40** [#2]	**6000** [#4]	**7100** [#4]	3400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-6	27-Jul-2012	1.1 - 1.5m	0.019	< 0.020	0.073	0.33	90	**13000** [#3]	**7600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	2.5 - 2.8m	0.020	< 0.020	0.020	0.24	**770** [#3]	**5000** [#3]	**2500** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	3.5 - 3.8m	0.91	0.033	0.081	11	**2300** [#4]	**2400** [#4]	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	27-Jul-2012	3.5 - 3.8m	0.41	< 0.020	0.044	2.6	**1700** [#4]	**5300** [#4]	2500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-7	27-Jul-2012	3.4 - 3.8m	0.0085	< 0.020	< 0.010	< 0.040	< 12	< 10	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	4.3 - 4.8m	< 0.0050	< 0.020	0.016	< 0.040	670	**3600** [#4]	**7200** [#4]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-8	27-Jul-2012	2.5 - 2.75m	0.027	< 0.020	0.013	< 0.040	< 12	< 10	38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	3.0 - 3.4m	0.012	< 0.020	< 0.010	< 0.040	< 12	22	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-9	26-Jul-2012	2.0 - 2.5m	**9.6** [#1]	< 0.020	0.070	0.43	**660** [#3]	**3200** [#3]	**15000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Jul-2012	2.5 - 3.0m	**2.8** [#1]	< 0.020	0.018	0.10	200	260 [#3]	**2700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-10	26-Jul-2012	1.5 - 2.5m	**7.2** [#1]	**9.8** [#1]	15	**88** [#1]	**4500** [#3]	**7000** [#3]	**3600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-11	27-Jul-2012	1.8 - 2.2m	0.29	**0.11** [#1]	0.92	3.1	**1400** [#3]	**1800** [#3]	870	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	4.0 - 4.5m	**31** [#2]	**56** [#2]	22	**110** [#2]	**7000** [#4]	**5600** [#4]	**6300** [#4]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2012	5.5 - 6.0m	**1.9** [#2]	**0.34** [#2]	0.31	3.9	**940** [#4]	**1500** [#4]	2300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-12	28-Jul-2012	2.0 - 2.5m	0.044	< 0.020	0.082	0.23	**1600** [#3]	**7600** [#3]	**9700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	3.7 - 4.0m	0.082	0.041	0.058	1.6	**1900** [#4]	**4100** [#4]	2600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	4.5 - 5.0m	**7.1** [#2]	< 0.040	0.11	**90** [#2]	**4500** [#4]	**5200** [#4]	**6400** [#4]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-12-13	28-Jul-2012	2.5 - 3.0m	0.020	0.036	0.064	0.23	< 12	53	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	3.8 - 4.3m	< 0.090	< 0.050	0.094	4.4	**4700** [#4]	**3600** [#4]	2200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	4.5 - 5.0m	< 0.080	0.025	0.047	2.7	**1200** [#4]	**1800** [#4]	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-1	05-Sep-2013	1.2 - 1.5m	**6.1** [#1]	< 0.020	0.23	18	**1800** [#3]	**6700** [#3]	**7300** [#3]	2500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-2013	2.0 - 2.5m	**4.2** [#1]	< 0.11 [#1]	0.27	**89** [#1]	**3600** [#3]	**2900** [#3]	**2700** [#3]	850	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	05-Sep-2013	2.0 - 2.5m	**3.1** [#1]	< 0.080	0.20	**52** [#1]	**1800** [#3]	**3800** [#3]	**3600** [#3]	1100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-2013	3.6 - 3.9m	0.11	0.091	0.091	1.9	100	**510** [#4]	880	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-2	06-Sep-2013	0.3 - 0.6m	0.010	< 0.020	< 0.010	< 0.040	< 12	43	120	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	1.2 - 1.5m	0.019	< 0.020	< 0.010	1.5	230	**1900** [#3]	**8000** [#3]	3000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	2.7 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	92	**680** [#3]	**1900** [#3]	620	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	3.4 - 3.7m	< 0.0050	< 0.020	< 0.010	0.086	170	**940** [#4]	2000	730	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Borehole Name	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Coarse Surface [#1]			**1.0**	**0.1**	**50**	**37**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Coarse Sub-Surface [#2]			**1.0**	**0.1**	**50**	**37**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**0.013**	**0.046**	**100**
CCME PHC in Soil Ind Coarse Surface [#3]			---	---	---	---	**320**	**260**	**1700**	**3300**	**3300**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Ind Coarse Sub-Surface [#4]			---	---	---	---	**700**	**380**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-3	06-Sep-2013	0.3 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	24	160	58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	1.2 - 1.5m	0.24	< 0.020	0.025	0.082	170	**760** [#3]	1300	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	2.2 - 2.5m	0.0074	< 0.020	0.018	0.054	100	**680** [#3]	1300	390	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	3.3 - 3.6m	0.074	< 0.020	1.3	1.6	200	**800** [#4]	1300	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-4	06-Sep-2013	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	28	320	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	2.9 - 3.0m	0.69	< 0.020	0.043	4.5	**510** [#3]	**870** [#3]	1500	620	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	3.0 - 3.3m	0.44	< 0.020	0.073	1.4	110	360	590	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-5	06-Sep-2013	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	71	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	1.0 - 1.5m	0.31	< 0.020	0.014	< 0.040	63	**490** [#3]	1700 [#3]	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	06-Sep-2013	1.0 - 1.5m	0.35	< 0.020	< 0.010	< 0.040	54	**270** [#3]	980	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2013	2.2 - 2.5m	0.45	< 0.020	0.027	0.19	19	64	89	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-6	09-Sep-2013	0.0 - 0.5m	< 0.0050	0.036	< 0.010	< 0.040	< 12	18	92	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-2013	1.0 - 1.6m	**3.4** [#1]	< 0.020	0.030	0.37	< 12	110	600	210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-2013	1.7 - 2.1m	**2.1** [#1]	0.031	0.11	16	**840** [#3]	**6700** [#3]	**10000** [#3]	**3700** [#3]	**16000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-01	12-Jun-2017	0.0 - 0.4m	0.069	< 0.020	0.016	0.066	12	97	1600	800	2900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jun-2017	1.0 - 1.5m	**33** [#1]	**0.88** [#1]	6.3	**320** [#1]	**47000** [#3]	**10000** [#3]	**8100** [#3]	2300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jun-2017	1.5 - 2.0m	**1.7** [#1]	0.034	0.11	1.5	280	**1400** [#3]	**2600** [#3]	920	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	12-Jun-2017	1.5 - 2.0m	**2.5** [#1]	0.029	0.17	2.4	**440** [#3]	**2700** [#3]	**3400** [#3]	1100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-02	12-Jun-2017	0.5 - 1.0m	0.16	0.031	0.055	0.28	170	**1800** [#3]	**3500** [#3]	1200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jun-2017	1.5 - 2.0m	**3.3** [#1]	**0.20** [#1]	5.6	17	**1600** [#3]	**3400** [#3]	**2000** [#3]	390	---	0.090	0.13	< 0.0040	0.021	< 0.0050	0.011	0.011	< 0.0050	< 0.0050	0.0060	**0.46** [#2]	< 0.0050	0.31	**2.4** [#2]	**0.96** [#2]	0.043
	12-Jun-2017	2.6 - 3.0m	**6.7** [#1]	**0.20** [#1]	5.9	**74** [#1]	**4600** [#3]	**4800** [#3]	**4100** [#3]	1100	---	0.11	0.18	0.050	0.041	< 0.0050	0.017	0.017	< 0.0050	< 0.0050	0.0094	**0.68** [#2]	0.020	0.47	**3.4** [#2]	**1.4** [#2]	0.065
	12-Jun-2017	3.5 - 3.75m	**1.4** [#2]	0.053	0.24	5.2	**870** [#4]	**1600** [#4]	2300	720	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-03	13-Jun-2017	0.0 - 0.5m	0.20	0.039	0.046	0.23	32	**340** [#3]	**1800** [#3]	730	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	1.5 - 1.8m	**22** [#1]	**85** [#1]	36	**180** [#1]	**5600** [#3]	**9600** [#3]	**4300** [#3]	710	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	4.0 - 4.5m	**3.4** [#2]	**0.48** [#2]	1.2	11	**1200** [#4]	**2800** [#4]	3300	940	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-04	13-Jun-2017	1.0 - 1.5m	0.89	**0.12** [#1]	0.033	0.18	39	260 [#3]	1500	640	2500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	1.5 - 2.0m	**12** [#1]	**54** [#2]	28	**130** [#1]	**6100** [#3]	**6800** [#3]	**3400** [#3]	560	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	3.5 - 4.0m	**7.4** [#2]	**28** [#2]	12	**57** [#2]	**6100** [#4]	**2500** [#4]	2300	570	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-05	13-Jun-2017	3.0 - 3.5m	**9.2** [#2]	**19** [#2]	7.1	33	**1900** [#4]	**3600** [#4]	**4500** [#4]	1300	---	0.18	0.13	< 0.0040	0.040	< 0.0050	0.016	0.016	< 0.0050	< 0.0050	0.014	**0.51** [#2]	0.0093	0.47	**1.7** [#2]	**1.5** [#2]	0.075
(Duplicate)	13-Jun-2017	3.0 - 3.5m	**7.8** [#2]	**18** [#2]	6.3	31	**1200** [#4]	**3200** [#4]	**4200** [#4]	1300	---	0.16	0.12	< 0.0040	0.035	< 0.0050	0.015	0.015	< 0.0050	< 0.0050	0.011	**0.45** [#2]	0.013	0.41	**1.2** [#2]	**1.3** [#2]	0.076
	13-Jun-2017	4.0 - 4.5m	0.51	**0.29** [#2]	0.040	0.18	81	**1000** [#4]	2000	680	3000	0.059	0.023	< 0.0040	0.027	< 0.0050	0.013	0.013	< 0.0050	< 0.0050	0.0073	0.11	0.011	0.35	**0.077** [#2]	**0.67** [#2]	0.048
RB-MW17-06	13-Jun-2017	2.5 - 3.0m	**16** [#2]	**35** [#1]	13	**59** [#1]	**2300** [#3]	**3800** [#3]	**4800** [#3]	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	3.5 - 4.0m	**14** [#2]	**32** [#2]	10	**47** [#2]	**1800** [#4]	**2700** [#4]	**3900** [#4]	1300	7300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-07	13-Jun-2017	2.5 - 3.0m	**1.2** [#1]	**1.2** [#1]	2.9	12	**1600** [#3]	**3800** [#3]	**7000** [#3]	2400	**13000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jun-2017	4.5 - 5.0m	0.75	**0.73** [#2]	0.70	3.2	340	**980** [#4]	1700	580	2600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Borehole Name	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Coarse Surface [#1]			1.0	0.1	50	37	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	10	10	180	0.25	10	1	0.013	0.046	100
CCME Industrial Coarse Sub-Surface [#2]			1.0	0.1	50	37	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	10	10	180	0.25	10	1	0.013	0.046	100
CCME PHC in Soil Ind Coarse Surface [#3]			---	---	---	---	320	260	1700	3300	3300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Ind Coarse Sub-Surface [#4]			---	---	---	---	700	380	3500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-01	23-Jun-2001	1.5 - 3.0m	0.85	**0.51** [#1]	1.9	20	**2700** [#3]	**3700** [#3]	**5500** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jun-2001	3.0 - 4.5m	0.11	**0.18** [#2]	0.28	3.5	530	380 [#4]	480	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-02	23-Jun-2001	1.5 - 3.0m	0.93	**0.48** [#1]	0.62	11	**990** [#3]	**1700** [#3]	**2500** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-03	23-Jun-2001	1.5 - 3.0m	**5.6** [#1]	**8.1** [#1]	15	**73** [#1]	**4300** [#3]	**5600** [#3]	**5500** [#3]	---	**7400** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-04	23-Jun-2001	1.5 - 2.6m	**9.1** [#1]	**9.9** [#1]	14	**63** [#1]	**2800** [#3]	**6300** [#3]	**7800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jun-2001	3.0 - 4.2m	**1.5** [#2]	**0.42** [#1]	1.7	9.3	**940** [#4]	**1200** [#4]	1700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-05	24-Jun-2001	0.0 - 1.5m	0.20	< 0.10 [#1]	< 0.10	3.2	**740** [#3]	**1100** [#3]	1700 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	1.5 - 2.0m	**6.6** [#1]	**6.5** [#2]	9.8	**39** [#1]	**3000** [#3]	**4000** [#3]	**2500** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-06	22-Jun-2001	4.5 - 5.0m	0.44	**0.17** [#2]	< 0.10	1.4	610	**660** [#4]	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-07	22-Jun-2001	5.0 - 6.0m	0.39	**0.32** [#2]	0.29	2.5	210	**660** [#4]	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-08	24-Jun-2001	1.5 - 3.0m	0.26	**0.36** [#1]	2.6	8.9	**420** [#3]	**420** [#3]	760	---	1600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	4.5 - 6.0m	0.46	**0.40** [#2]	0.40	11	260	250	320	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB01-09	24-Jun-2001	1.0 - 1.5m	0.24	**0.24** [#1]	< 0.10	0.5	**1800** [#3]	**2800** [#3]	**2400** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	3.0 - 4.5m	**1.1** [#2]	**0.73** [#2]	2.1	**45** [#2]	**1600** [#4]	**2600** [#4]	3500 [#4]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-01	12-Jul-2003	0.0 - 1.5m	0.51	**0.24** [#1]	0.20	0.96	98	**1100** [#3]	**3600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	1.5 - 3.0m	0.11	< 0.10 [#1]	< 0.10	< 0.37	99	**2400** [#3]	**8700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-02	12-Jul-2003	0.0 - 1.5m	0.71	**0.32** [#1]	0.24	0.87	83	**430** [#3]	**2900** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	1.5 - 3.0m	0.18	**0.15** [#1]	0.13	2.89	300	**2500** [#3]	**11000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-03	12-Jul-2003	0.0 - 1.5m	**1.6** [#1]	**0.14** [#1]	7.4	**58** [#1]	**2800** [#3]	**9100** [#3]	**9900** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	1.5 - 3.0m	**4.2** [#1]	< 0.10 [#1]	0.84	**37.3** [#1]	**1200** [#3]	**6300** [#3]	**11000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-04	12-Jul-2003	0.0 - 1.5m	**4.0** [#1]	**0.20** [#1]	17	**57** [#1]	**3700** [#3]	**3900** [#3]	**3900** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	1.5 - 3.0m	**13** [#1]	< 0.10 [#1]	21	**209** [#1]	**5400** [#3]	**5800** [#3]	**10000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	3.0 - 4.5m	0.67	**0.13** [#2]	0.40	15.6	490	**2200** [#4]	3100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-05	12-Jul-2003	0.0 - 1.5m	**5.3** [#1]	**0.21** [#1]	16	**52** [#1]	**5900** [#3]	**6000** [#3]	**5400** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	1.5 - 3.0m	0.18	**0.18** [#1]	2.5	**70** [#1]	**2100** [#3]	**3900** [#3]	**6600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	3.0 - 4.5m	**1.7** [#2]	**0.70** [#2]	1.2	**44.5** [#2]	**1300** [#3]	**2800** [#3]	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB03-06	12-Jul-2003	0.0 - 1.5m	**0.37**	< 0.10 [#1]	0.48	1.33	**350** [#3]	**2800** [#3]	**3700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	1.5 - 3.0m	**27** [#1]	**110** [#2]	37	**175** [#1]	**6900** [#3]	**10000** [#3]	**8800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Jul-2003	3.0 - 4.5m	**1.8** [#2]	**5.3** [#2]	2.4	12.5	**350** [#3]	**1700** [#3]	**2900** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian

WorleyParsons Group

Table 2
Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Borehole Name	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																	
			Benzene	Toluene	Ethylbenzene	Xylenes (Total)	PHC F1 (C_6-C_{10}) - BTEX	PHC F2 (C_{10}-C_{16})	PHC F3 (C_{16}-C_{34})	PHC F4 (C_{34}-C_{50})	PHC F4 (C_{34}-C_{50+})-Gravimetric	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)Anthracene	Benzo(a)Pyrene	Benzo(a)Pyrene Total Potency Equivalent	Benzo(a)Pyrene Total Potency Equivalent (CCME)	Benzo(k)Fluoranthene	Dibenzo(a,h)Anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)Pyrene	Calculate CCME IACR	Naphthalene	Phenanthrene	Pyrene
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(none)	(mg/kg)	(mg/kg)	(mg/kg)
CCME Industrial Coarse Surface [#1]			1.0	0.1	50	37	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	10	10	180	0.25	10	1	0.013	0.046	100
CCME Industrial Coarse Sub-Surface [#2]			1.0	0.1	50	37	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	10	10	180	0.25	10	1	0.013	0.046	100
CCME PHC in Soil Ind Coarse Surface [#3]			---	---	---	---	320	260	1700	3300	3300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Ind Coarse Sub-Surface [#4]			---	---	---	---	700	380	3500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Coarse-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Coarse-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Coarse-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Coarse-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols: Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Dissolved Metals: Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
NWR 00-25-36	21-Aug-2002	**600 [#1]**	7.5	< 0.02	< 0.005	**30 [#1]**	0.020	**0.006 [#1]**	1.49	**< 0.00010 [#1]**	< 0.001	**0.0247 [#1]**	**0.316 [#1]**	0.0012	**0.00062 [#1]**	< 0.005	< 0.008	**0.002 [#1]**	< 0.0001	< 0.0001	0.00052	0.019
	26-Aug-2003	**788 [#1]**	**9.0 [#1]**	< 0.2	< 0.06	---	---	**0.013 [#1]**	1.229	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	0.027	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	< 0.005
NWR 01-29-7	26-Aug-2001	36.8	7.7	< 0.02	< 0.005	**179 [#1]**	0.05	**< 0.05 [#1]**	0.048	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.357 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	21-Aug-2002	27.8	6.8	< 0.02	0.007	**138 [#1]**	**0.384 [#1]**	**0.218 [#1]**	0.051	< 0.00001	< 0.001	0.0020	**65.7 [#1]**	0.0030	**0.00048 [#1]**	< 0.005	< 0.008	**0.001 [#1]**	< 0.0001	< 0.0001	0.00072	0.023
	26-Aug-2003	23	7.3	< 0.2	< 0.06	---	---	**0.126 [#1]**	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**70.96 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.001 [#1]**	---	---	**< 1.0 [#1]**	0.006
	05-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.0022	---	---	---	---	---	---	---	---
(Duplicate)	05-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.0022	---	---	---	---	---	---	---	---
NWR 01-30-4	26-Aug-2001	58.8	7.1	< 0.02	0.005	---	< 0.02	**0.11 [#1]**	0.256	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.205	**0.04 [#1]**	---	< 0.005	0.009	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	22-Aug-2002	50.9	7.3	0.02	0.010	**41 [#1]**	0.032	**0.352 [#1]**	0.283	**< 0.00010 [#1]**	0.003	< 0.0002	**91.5 [#1]**	**0.0116 [#1]**	**< 0.00005 [#1]**	< 0.005	< 0.008	**0.002 [#1]**	< 0.0001	< 0.0001	0.00189	0.010
	26-Aug-2003	65	7.0	< 0.2	< 0.06	---	---	**0.255 [#1]**	0.310	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**46.89 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.001 [#1]**	---	---	**< 1.0 [#1]**	0.006
	25-Aug-2005	32.2	---	< 0.2	< 0.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	21	6.9	< 0.2	< 0.06	**137 [#1]**	0.019	**0.054 [#1]**	0.42	< 0.00001	< 0.007	**0.014 [#1]**	**43.9 [#1]**	**0.022 [#1]**	**< 0.00005 [#1]**	< 0.006	0.050	< 0.001	< 0.0001	< 0.0008	0.005	0.010
NWR 01-31-4	21-Aug-2002	68.7	7.1	< 0.02	< 0.005	**9 [#1]**	0.015	**0.006 [#1]**	0.526	< 0.00001	< 0.001	0.0030	**0.560 [#1]**	0.0021	**< 0.00005 [#1]**	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	0.00014	**0.183 [#1]**
	26-Aug-2003	**143 [#1]**	6.7	< 0.2	< 0.06	---	---	**0.010 [#1]**	0.560	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**3.804 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.002 [#1]**	---	---	**< 1.0 [#1]**	0.006
	23-Aug-2004	60	7.2	< 0.2	< 0.06	---	< 0.010	**0.012 [#1]**	0.583	< 0.000034	< 0.005	**0.007 [#1]**	**2.423 [#1]**	0.004	**< 0.00005 [#1]**	< 0.005	< 0.008	**< 0.002 [#1]**	< 0.0002	**< 0.0016 [#1]**	< 0.002	< 0.005
	25-Aug-2005	99.2	7.7	< 0.2	< 0.06	**22 [#1]**	0.006	**0.0109 [#1]**	0.61	0.00002	< 0.007	**0.006 [#1]**	**2.66 [#1]**	0.004	**< 0.00005 [#1]**	< 0.006	< 0.008	**0.002 [#1]**	< 0.0001	< 0.0008	0.003	**0.124 [#1]**
	20-Aug-2006	70	7.4	< 0.2	< 0.06	**15 [#1]**	< 0.005	< 0.005	0.66	< 0.00001	< 0.007	0.003	**0.856 [#1]**	0.001	**< 0.00005 [#1]**	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	0.002	< 0.005
NWR 01-32-4	26-Aug-2001	51.9	7.2	< 0.02	< 0.005	**13 [#1]**	**0.13 [#1]**	**< 0.05 [#1]**	0.489	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**2.65 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	22-Aug-2002	80.8	7.7	< 0.02	< 0.005	**10 [#1]**	**0.106 [#1]**	**0.029 [#1]**	0.468	< 0.00001	< 0.001	**0.0055 [#1]**	**4.57 [#1]**	0.0020	**< 0.00005 [#1]**	< 0.005	< 0.008	**0.001 [#1]**	< 0.0001	< 0.0001	0.00007	0.008
	26-Aug-2003	65	6.6	< 0.2	< 0.06	---	---	**0.134 [#1]**	0.460	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**3.252 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	0.006
	20-Aug-2006	34	7.5	< 0.2	< 0.06	**62 [#1]**	< 0.005	**0.022 [#1]**	0.44	< 0.00001	< 0.007	< 0.002	**2.59 [#1]**	0.002	**< 0.00005 [#1]**	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	0.001	< 0.005
NWR 01-33-4	26-Aug-2001	59.0	7.3	< 0.02	< 0.005	**38 [#1]**	**0.11 [#1]**	**0.06 [#1]**	0.390	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.821 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	22-Aug-2002	42.7	7.7	< 0.02	< 0.005	**18 [#1]**	**0.381 [#1]**	**0.037 [#1]**	0.138	< 0.00001	< 0.001	0.0024	**30.5 [#1]**	**0.0115 [#1]**	**< 0.00005 [#1]**	< 0.005	0.013	< 0.001	< 0.0001	< 0.0001	0.00390	**0.032 [#1]**
	26-Aug-2003	74	7.2	< 0.2	< 0.06	---	---	**0.044 [#1]**	0.196	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**2.563 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	0.007
	23-Aug-2004	53	7.1	< 0.2	< 0.06	---	< 0.005	< 0.005	0.337	**0.000103 [#1]**	< 0.005	0.003	**5.421 [#1]**	**0.022 [#1]**	**< 0.00005 [#1]**	< 0.005	0.037	**0.024 [#1]**	< 0.0001	< 0.0008	0.006	< 0.005
	20-Aug-2006	37	7.3	< 0.2	< 0.06	**53 [#1]**	0.054	**0.031 [#1]**	0.31	< 0.00001	< 0.007	< 0.002	**12.1 [#1]**	0.006	**< 0.00005 [#1]**	< 0.006	0.014	< 0.001	< 0.0001	< 0.0008	0.001	< 0.005
NWR 01-34-2	22-Aug-2002	10.2	6.9	< 0.02	< 0.005	**19 [#1]**	0.033	**0.011 [#1]**	0.026	< 0.00001	< 0.001	0.0009	**34.7 [#1]**	0.0010	**< 0.00005 [#1]**	< 0.005	0.026	**0.001 [#1]**	< 0.0001	< 0.0001	0.00651	0.012
	26-Aug-2003	22	6.7	< 0.2	< 0.06	---	---	**0.015 [#1]**	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**63.57 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.004 [#1]**	---	---	**< 1.0 [#1]**	0.005
	23-Aug-2004	28	7.0	< 0.2	< 0.06	---	0.010	< 0.005	0.032	< 0.000017	< 0.005	0.003	**49.67 [#1]**	0.002	**< 0.00005 [#1]**	0.012	0.034	< 0.001	< 0.0001	< 0.0008	**0.022 [#1]**	< 0.005
	25-Aug-2005	24.7	7.3	< 0.2	< 0.06	**56 [#1]**	0.0109	**0.0159 [#1]**	0.05	**0.00009 [#1]**	< 0.007	**0.0146 [#1]**	**12.3 [#1]**	**0.0288 [#1]**	**< 0.00005 [#1]**	< 0.006	0.028	**0.002 [#1]**	< 0.0001	< 0.0008	0.004	**0.136 [#1]**
	20-Aug-2006	25	7.2	< 0.2	< 0.06	**28 [#1]**	< 0.005	**0.015 [#1]**	< 0.05	**0.00013 [#1]**	< 0.007	**0.005 [#1]**	**31.6 [#1]**	0.003	**< 0.00005 [#1]**	< 0.006	0.031	< 0.001	< 0.0001	< 0.0008	0.004	0.016
(Duplicate)	20-Aug-2006	---	---	---	---	**23 [#1]**	---	**0.014 [#1]**	< 0.05	**0.00034 [#1]**	< 0.007	**0.005 [#1]**	< 0.006	0.003	**< 0.00005 [#1]**	< 0.006	< 0.008	< 0.001	< 0.0001	---	0.005	< 0.005

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
		Inorganic Parameters and Phenols					Dissolved Metals															
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
NWR 02-12-7	24-Aug-2004	37	7.8	< 0.2	< 0.06	---	---	---	---	---	---	---	< 0.005	---	---	---	---	---	---	---	---	---
	25-Aug-2005	32.3	8.0	< 0.2	< 0.06	---	< 0.005	**0.005** [#1]	0.21	0.00004	< 0.007	**0.0139** [#1]	0.059	0.001	**0.00006** [#1]	< 0.006	< 0.008	**0.002** [#1]	< 0.0001	< 0.0008	< 0.001	**0.117** [#1]
	19-Aug-2008	27	7.6	0.11	0.009	**6** [#1]	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---	---
	17-Aug-2009	26	7.72	0.15	0.004	**8** [#1]	< 0.001	0.0011	0.22	0.000017	< 0.001	**0.011** [#1]	< 0.06	< 0.0002	---	< 0.0002	0.0053	0.0003	< 0.0001	< 0.0002	0.0005	0.019
	13-Aug-2017	25	---	< 0.010	0.014	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR 03-35-5	26-Aug-2003	66	**9.1** [#1]	< 0.2	< 0.06	---	---	**0.142** [#1]	0.200	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**13.40** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.002** [#1]	---	---	**< 1.0** [#1]	< 0.005
	25-Aug-2005	20.8	7.2	< 0.2	< 0.06	**133** [#1]	0.0328	**0.0570** [#1]	0.35	0.00005	< 0.007	**0.0119** [#1]	**15.7** [#1]	**0.0806** [#1]	**< 0.00005** [#1]	< 0.006	0.031	**0.003** [#1]	< 0.0001	< 0.0008	0.004	**0.065** [#1]
	20-Aug-2006	61	7.2	< 0.2	< 0.06	**87** [#1]	0.014	**0.069** [#1]	0.60	< 0.00001	< 0.007	0.003	**22.9** [#1]	**0.013** [#1]	**< 0.00005** [#1]	< 0.006	0.013	< 0.001	< 0.0001	< 0.0008	0.002	0.006
	21-Aug-2007	86	7.1	< 0.2	< 0.06	**29** [#1]	0.020	**0.125** [#1]	0.59	< 0.00001	0.004	**0.0079** [#1]	**16.0** [#1]	**0.0141** [#1]	---	0.0025	0.0230	**0.006** [#1]	< 0.0001	< 0.0002	0.0030	0.020
NWR 03-36-5	26-Aug-2003	46	8.0	< 0.2	< 0.06	---	---	**0.481** [#1]	0.285	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**42.31** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.001** [#1]	---	---	**< 1.0** [#1]	0.010
NWR 03-37-4	26-Aug-2003	71	8.4	< 0.2	< 0.06	---	---	**0.045** [#1]	0.147	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**14.55** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.001** [#1]	---	---	**< 1.0** [#1]	0.026
	23-Aug-2004	29	6.9	< 0.2	< 0.06	---	< 0.005	< 0.005	0.241	**0.000158** [#1]	< 0.005	**0.012** [#1]	**27.19** [#1]	< 0.001	**< 0.00005** [#1]	< 0.005	0.054	< 0.001	< 0.0001	< 0.0008	0.008	< 0.005
	25-Aug-2005	35.6	7.1	< 0.2	< 0.06	**75** [#1]	0.0211	**0.122** [#1]	0.29	0.00002	< 0.007	**0.008** [#1]	**26.4** [#1]	0.004	**< 0.00005** [#1]	< 0.006	0.017	**0.002** [#1]	< 0.0001	< 0.0008	0.003	**0.089** [#1]
NWR 03-38-3	26-Aug-2003	**291** [#1]	7.0	< 0.2	< 0.06	---	---	**0.010** [#1]	0.943	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**5.244** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	0.005
	23-Aug-2004	**150** [#1]	7.5	< 0.2	< 0.06	---	< 0.010	**< 0.010** [#1]	0.786	0.000049	< 0.005	**0.011** [#1]	0.099	0.003	**< 0.00005** [#1]	< 0.005	0.011	**< 0.002** [#1]	< 0.0002	**< 0.0016** [#1]	0.003	< 0.005
	25-Aug-2005	104	7.8	< 0.2	< 0.06	**23** [#1]	< 0.005	< 0.005	0.55	**0.00019** [#1]	< 0.007	**0.006** [#1]	**1.17** [#1]	0.003	**< 0.00005** [#1]	< 0.006	0.017	**0.001** [#1]	< 0.0001	< 0.0008	0.003	0.016
	20-Aug-2006	**174** [#1]	7.8	< 0.2	< 0.06	**12** [#1]	< 0.005	< 0.005	0.59	< 0.00001	< 0.007	**0.014** [#1]	**2.15** [#1]	0.001	**< 0.00005** [#1]	< 0.006	0.012	< 0.001	< 0.0001	< 0.0008	0.004	0.009
NWR 03-39-4	26-Aug-2003	**227** [#1]	7.1	< 0.2	< 0.06	---	---	< 0.005	0.348	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	0.135	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.002** [#1]	---	---	**< 1.0** [#1]	0.007
	23-Aug-2004	**139** [#1]	7.4	< 0.2	< 0.06	---	< 0.010	**< 0.010** [#1]	0.674	< 0.000034	< 0.005	**0.010** [#1]	0.092	0.003	**< 0.00005** [#1]	0.006	0.011	**0.003** [#1]	< 0.0002	**< 0.0016** [#1]	0.006	< 0.005
	20-Aug-2006	**145** [#1]	7.5	< 0.2	< 0.06	**22** [#1]	< 0.005	**0.037** [#1]	0.66	< 0.00001	< 0.007	0.003	**8.12** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.044	< 0.001	< 0.0001	< 0.0008	0.003	0.006
NWR 03-40-2	26-Aug-2003	21	6.8	< 0.2	< 0.06	**17** [#1]	0.008	0.0021	0.08	**< 0.002** [#1]	< 0.007 < 0.001	**0.011** [#1]	**45.73** [#1]	< 0.0002	**< 0.00005** [#1]	< 0.0002	0.034	**0.0012** [#1]	< 0.0001	< 0.0002	**0.042** [#1]	0.013 0.028
NWR 03-41-17	20-Aug-2006	**154** [#1]	7.6	< 0.2	< 0.06	**6** [#1]	< 0.005	**0.034** [#1]	0.57	< 0.00001	< 0.007	< 0.002	**0.815** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.016	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	21-Aug-2007	109	7.4	< 0.2	< 0.06	**14** [#1]	0.005	**0.021** [#1]	0.61	< 0.00001	0.008	**0.0066** [#1]	**0.30** [#1]	0.0024	---	0.0012	0.0211	**0.004** [#1]	< 0.0001	< 0.0002	0.0005	0.021
	19-Aug-2008	**130** [#1]	7.5	0.003	< 0.003	**9** [#1]	< 0.001	**0.012** [#1]	0.52	< 0.00001	< 0.001	0.0018	**0.50** [#1]	< 0.0002	---	< 0.0002	0.0085	< 0.001	< 0.0001	< 0.0002	< 0.0001	**0.038** [#1]
	17-Aug-2009	86	7.57	0.004	< 0.003	**5** [#1]	< 0.001	**0.023** [#1]	0.50	< 0.000005	< 0.001	0.0014	**0.67** [#1]	< 0.0002	---	< 0.0002	0.0060	0.0005	< 0.0001	< 0.0002	< 0.0001	0.011
	20-Aug-2010	80	8.12	< 0.3	**< 0.3** [#1]	3	0.002	**0.017** [#1]	0.48	< 0.000005	< 0.001	0.0019	**0.59** [#1]	0.0026	---	0.0018	0.0023	0.0004	< 0.0001	< 0.0002	< 0.0001	0.009
NWR 03-42-19	21-Aug-2007	**213** [#1]	7.6	< 0.2	< 0.06	**14** [#1]	0.005	**0.026** [#1]	1.13	< 0.00001	0.003	0.0030	**0.44** [#1]	0.0054	---	0.0006	0.0142	**0.006** [#1]	< 0.0001	< 0.0002	0.0005	0.019
	19-Aug-2008	**190** [#1]	7.9	< 0.003	< 0.003	**10** [#1]	< 0.001	0.004	1.0	0.00002	< 0.001	0.0017	**0.48** [#1]	< 0.0002	---	< 0.0002	0.0021	< 0.001	< 0.0001	< 0.0002	< 0.0001	0.029
	17-Aug-2009	**150** [#1]	7.61	0.007	0.004	**14** [#1]	< 0.001	**0.012** [#1]	1.1	< 0.000005	< 0.001	0.0005	**0.68** [#1]	< 0.0002	---	< 0.0002	0.0027	0.0006	< 0.0001	< 0.0002	< 0.0001	0.004
	20-Aug-2010	**140** [#1]	8.04	0.033	0.004	**7** [#1]	< 0.001	0.0026	0.92	< 0.000005	< 0.001	0.0008	0.20	< 0.0002	---	0.0002	0.0011	**0.0015** [#1]	< 0.0001	< 0.0002	< 0.0001	0.004
	17-Aug-2011	110	---	0.10	< 0.03	< 2	0.005	**0.0050** [#1]	0.67	0.000008	< 0.001	0.0009	0.21	0.0004	---	< 0.0002	0.0015	**0.0014** [#1]	< 0.0001	< 0.0002	0.0001	0.007

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols: Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Dissolved Metals: Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
NWR 03-43-20	19-Aug-2008	**240 [#1]**	8.0	0.005	< 0.003	**12 [#1]**	< 0.001	**0.012 [#1]**	1.1	< 0.00001	< 0.001	0.0009	0.11	< 0.0002	---	< 0.0002	0.0021	**0.004 [#1]**	< 0.0001	< 0.0002	< 0.0001	0.015
	17-Aug-2009	96	7.29	0.010	< 0.003	**15 [#1]**	0.015	**0.045 [#1]**	0.57	< 0.000005	< 0.001	0.0018	**1.3 [#1]**	0.0006	---	< 0.0002	0.019	0.0006	< 0.0001	< 0.0002	0.0008	0.010
	20-Aug-2010	**170 [#1]**	8.11	0.030	< 0.003	**5 [#1]**	0.002	0.0043	1.0	< 0.000005	< 0.001	0.0007	0.18	< 0.0002	---	0.0012	0.0013	**0.0016 [#1]**	< 0.0001	< 0.0002	0.0001	0.005
	17-Aug-2011	**160 [#1]**	---	0.05	< 0.03	< 2	0.005	**0.0078 [#1]**	0.91	< 0.00003	< 0.001	< 0.0002	0.14	< 0.0002	---	< 0.0002	0.0020	**0.0015 [#1]**	< 0.0001	< 0.0002	0.0005	0.009
	19-Aug-2012	**140 [#1]**	---	< 0.0030	< 0.0030	**8.9 [#1]**	0.0032	**0.027 [#1]**	0.70	< 0.000025	< 0.0010	0.00055	**1.2 [#1]**	0.00023	---	< 0.00020	0.0022	**0.0014 [#1]**	< 0.00010	< 0.00020	0.00030	0.012
NWR 09-1-2	17-Aug-2009	37	6.98	< 0.003	< 0.003	3	0.002	0.0023	0.02	0.000053	< 0.001	0.0036	**4.4 [#1]**	0.0003	---	0.0015	0.025	0.0004	< 0.0001	< 0.0002	0.0084	0.012
NWR 09-1-20	25-Aug-2013	**130 [#1]**	8.08	< 0.0030	< 0.0030	**< 10 [#1]**	0.0043	**0.0075 [#1]**	0.61	< 0.000025	< 0.0010	0.00031	**2.4 [#1]**	< 0.00020	---	0.00091	0.0015	0.00070	< 0.00010	< 0.00020	0.00019	< 0.0030
	08-May-2014	82	7.42	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	100	7.33	< 0.010	< 0.010	**18 [#1]**	0.0066	0.0038	0.54	< 0.000020	< 0.0010	0.0010	**1.7 [#1]**	< 0.00020	---	< 0.00020	0.00059	**0.0042 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0049
	31-May-2015	**120 [#1]**	7.84	< 0.010	0.011	3.2	0.0055	0.0034	0.75	< 0.000020	< 0.0010	0.0012	**0.42 [#1]**	< 0.00020	---	< 0.00020	0.0014	**0.0017 [#1]**	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	05-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.00025	---	---	---	---	---	---	---	---
(Duplicate)	05-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.00022	---	---	---	---	---	---	---	---
	08-Aug-2015	**180 [#1]**	7.66	< 0.010	< 0.010	**7.5 [#1]**	< 0.0030	0.0033	0.67	< 0.000020	< 0.0010	0.00061	**0.34 [#1]**	< 0.00020	---	< 0.00020	0.0016	**0.0050 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0054
	25-Nov-2015	**170 [#1]**	7.81	< 0.010	< 0.010	**4.3 [#1]**	0.0073	**0.0051 [#1]**	1.0	< 0.000020	< 0.0010	0.0012	**0.84 [#1]**	< 0.00020	---	< 0.00020	0.0011	**0.0019 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0074
	12-Mar-2016	63	7.56	< 0.010	< 0.010	3.2	0.0051	0.0020	0.60	< 0.000020	< 0.0010	0.00058	0.24	< 0.00020	---	< 0.00020	0.0017	0.00050	< 0.00010	< 0.00020	< 0.00010	0.012
	05-Aug-2016	82	---	< 0.010	< 0.010	---	0.0060	0.0035	0.58	< 0.000020	0.0025	0.0012	**0.82 [#1]**	< 0.00020	---	< 0.00020	0.0029	**0.0010 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0074
	03-Nov-2016	100	7.67	< 0.050	< 0.050	3.5	0.0050	0.0022	0.66	< 0.000020	< 0.0010	< 0.00020	**1.2 [#1]**	< 0.00020	---	< 0.00020	< 0.00050	**0.0034 [#1]**	< 0.00010	< 0.00020	0.0011	< 0.0030
	13-Aug-2017	**290 [#1]**	---	< 0.010	< 0.010	---	0.0078	0.0039	0.75	< 0.000020	< 0.0010	0.00055	**1.1 [#1]**	< 0.00020	---	< 0.00020	0.00069	0.00026	< 0.00010	< 0.00020	< 0.00010	0.0080
NWR 09-2-2	17-Aug-2009	19	6.98	0.004	0.004	**42 [#1]**	0.005	**0.014 [#1]**	0.02	0.000005	0.004	0.0019	**32 [#1]**	0.0018	---	0.0048	0.019	**0.0012 [#1]**	< 0.0001	< 0.0002	0.0038	0.013
NWR 09-2-26	25-Aug-2013	80	---	< 0.0030	< 0.0030	**100 [#1]**	0.052	**0.020 [#1]**	0.11	< 0.000025	0.0014	0.00044	**21 [#1]**	< 0.00020	---	0.0035	0.0066	0.00093	< 0.00010	< 0.00020	0.0080	< 0.0030
(Duplicate)	25-Aug-2013	**170 [#1]**	---	< 0.0030	< 0.0030	**110 [#1]**	0.045	**0.020 [#1]**	0.10	< 0.000025	0.0013	< 0.00020	**21 [#1]**	< 0.00020	---	0.0034	0.0057	0.00091	< 0.00010	< 0.00020	0.0078	< 0.0030
	08-May-2014	**190 [#1]**	7.50	< 0.010	0.017	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	**1900 [#1]**	---	< 0.010	< 0.010	**23 [#1]**	< 0.030	**0.0063 [#1]**	0.60	**0.00099 [#1]**	**< 0.010 [#1]**	< 0.0020	**3.4 [#1]**	< 0.0020	---	0.0035	< 0.0050	**< 0.0020 [#1]**	**< 0.0010 [#1]**	**< 0.0020 [#1]**	0.010	< 0.030
(Duplicate)	01-Aug-2014	**2400 [#1]**	---	< 0.010	< 0.010	**24 [#1]**	0.017	0.0043	0.71	< 0.000020	< 0.0010	0.00077	**2.8 [#1]**	< 0.00020	---	0.00066	0.0010	**0.0015 [#1]**	< 0.00010	< 0.00020	0.0020	0.0072
	01-Jun-2015	93	7.25	< 0.010	0.011	**65 [#1]**	0.016	**0.0092 [#1]**	0.10	< 0.000020	< 0.0010	0.00045	**3.6 [#1]**	< 0.00020	---	0.0029	0.0053	**0.0018 [#1]**	< 0.00010	< 0.00020	**0.028 [#1]**	< 0.0030
	08-Aug-2015	**2400 [#1]**	---	< 0.010	< 0.010	**< 10 [#1]**	< 0.060	**0.0066 [#1]**	0.58	**< 0.00040 [#1]**	**< 0.020 [#1]**	< 0.0040	**1.9 [#1]**	< 0.0040	---	< 0.0040	< 0.010	**< 0.0040 [#1]**	**< 0.0020 [#1]**	**< 0.0040 [#1]**	0.010	**< 0.060 [#1]**
	25-Nov-2015	**3100 [#1]**	7.70	< 0.010	< 0.010	**< 10 [#1]**	0.0075	0.0043	1.1	< 0.000020	< 0.0010	0.0023	**1.8 [#1]**	< 0.00020	---	0.00080	0.0022	**0.0016 [#1]**	< 0.00010	< 0.00020	0.0035	0.0095
	05-Aug-2016	82	---	< 0.010	< 0.010	---	0.013	**0.0078 [#1]**	0.28	< 0.000020	< 0.0010	0.00021	**1.7 [#1]**	< 0.00020	---	0.0024	0.0047	**0.0014 [#1]**	< 0.00010	< 0.00020	0.0079	0.0052
(Duplicate)	05-Aug-2016	29	---	< 0.010	< 0.010	---	0.012	**0.0074 [#1]**	0.27	< 0.000020	< 0.0010	< 0.00020	**1.7 [#1]**	< 0.00020	---	0.0023	0.0043	**0.0011 [#1]**	< 0.00010	< 0.00020	0.0073	< 0.0030
	03-Nov-2016	24	7.50	< 0.050	< 0.050	**46 [#1]**	0.0054	0.00081	0.042	0.000031	< 0.0010	0.0017	**2.2 [#1]**	< 0.00020	---	0.0036	0.0029	0.00034	< 0.00010	< 0.00020	**0.26 [#1]**	0.0051
(Duplicate)	03-Nov-2016	24	7.35	< 0.010	< 0.010	**46 [#1]**	0.0047	0.00029	0.047	< 0.000020	< 0.0010	< 0.00020	**2.2 [#1]**	0.00031	---	0.0017	0.00055	< 0.00020	< 0.00010	< 0.00020	0.00033	**0.60 [#1]**
	13-Aug-2017	**2600 [#1]**	---	< 0.10	**< 0.10 [#1]**	---	0.0077	0.0040	1.2	< 0.000020	< 0.0010	0.0013	**2.8 [#1]**	< 0.00020	---	0.00079	0.00070	0.00045	< 0.00010	< 0.00020	0.00070	0.0075
(Duplicate)	13-Aug-2017	**2300 [#1]**	---	< 0.10	**< 0.10 [#1]**	---	0.0056	0.0039	1.2	< 0.000020	0.0016	0.0012	**2.7 [#1]**	< 0.00020	---	0.00085	0.0010	0.00061	< 0.00010	< 0.00020	0.00069	0.0040
NWR 09-3-20	21-Aug-2013	**140 [#1]**	---	0.010	< 0.0030	**19 [#1]**	0.0039	**0.011 [#1]**	0.86	0.000028	< 0.0010	0.00036	**1.7 [#1]**	< 0.00020	---	0.0042	0.0029	0.00033	< 0.00010	< 0.00020	0.00051	0.0063
	11-Oct-2013	85	7.62	0.014	< 0.0030	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	---
	08-May-2014	110	8.10	0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	110	---	< 0.010	< 0.010	**12 [#1]**	0.0053	**0.0072 [#1]**	0.85	< 0.000020	< 0.0010	0.00087	**1.5 [#1]**	0.00023	---	0.0047	0.0023	0.00078	< 0.00010	< 0.00020	0.00059	0.0089
	31-May-2015	**200 [#1]**	7.87	< 0.010	< 0.010	**11 [#1]**	< 0.0030	**0.0057 [#1]**	1.0	< 0.000020	< 0.0010	0.00081	**2.0 [#1]**	< 0.00020	---	0.0039	0.0018	0.00026	< 0.00010	< 0.00020	0.00044	< 0.0030
	04-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	< 0.00020	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	< 0.00020	---	---	---	---	---	---	---	---
	09-Aug-2015	**190 [#1]**	---	< 0.010	< 0.010	**9.3 [#1]**	0.0034	**0.0054 [#1]**	0.98	< 0.000020	< 0.0010	0.0023	**2.2 [#1]**	< 0.00020	---	0.0032	0.0013	0.00023	< 0.00010	< 0.00020	0.00036	0.0070
	25-Nov-2015	**170 [#1]**	7.72	< 0.010	< 0.010	< 4.0	0.0033	**0.0056 [#1]**	1.0	< 0.000020	< 0.0010	0.00063	**3.1 [#1]**	< 0.00020	---	0.0030	0.0025	0.00070	< 0.00010	< 0.00020	0.00037	0.0087
	12-Mar-2016	**130 [#1]**	7.62	< 0.010	< 0.010	**4.1 [#1]**	0.0042	**0.0056 [#1]**	0.90	< 0.000020	< 0.0010	< 0.00020	**2.4 [#1]**	< 0.00020	---	0.0012	0.0013	**0.0013 [#1]**	< 0.00010	< 0.00020	0.00032	0.0064
	05-Aug-2016	**130 [#1]**	---	< 0.010	< 0.010	---	0.0039	**0.0054 [#1]**	0.82	0.000056	< 0.0010	0.00072	**2.2 [#1]**	0.0017	---	0.00090	0.0013	0.00040	< 0.00010	< 0.00020	0.00026	0.0039
	15-Aug-2017	110	---	< 0.010	< 0.010	---	0.0040	**0.0050 [#1]**	0.84	< 0.000020	< 0.0010	0.0013	**2.4 [#1]**	< 0.00020	---	0.00088	0.0013	0.00029	< 0.00010	< 0.00020	0.00027	0.0053

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Inorganic Parameters and Phenols					Dissolved Metals														
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
NWR 09-4-17	25-Aug-2013	110	---	0.029	0.0095	2.6	0.0047	**0.013 [#1]**	0.83	< 0.000025	< 0.0010	< 0.00020	0.14	< 0.00020	---	0.0020	0.0050	0.00043	< 0.00010	< 0.00020	0.0012	< 0.0030
	08-May-2014	110	7.62	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	100	---	0.016	< 0.010	**7.4 [#1]**	0.0041	**0.010 [#1]**	0.92	0.000038	< 0.0010	0.0012	**1.0 [#1]**	**0.074 [#1]**	---	0.0028	0.025	0.00035	< 0.00010	< 0.00020	0.0014	0.029
	01-Jun-2015	100	7.86	< 0.010	< 0.010	**5.3 [#1]**	< 0.0030	**0.010 [#1]**	0.88	0.000038	< 0.0010	0.0012	**1.4 [#1]**	0.0014	---	0.0026	0.029	0.00021	< 0.00010	< 0.00020	0.0017	0.0062
	04-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.0018	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.0014	---	---	---	---	---	---	---	---
	08-Aug-2015	100	---	< 0.010	< 0.010	< 2.0	< 0.0030	**0.0094 [#1]**	0.98	< 0.000020	< 0.0010	< 0.00020	**1.3 [#1]**	0.0018	---	0.0012	0.012	0.00056	< 0.00010	< 0.00020	0.0011	0.0048
	25-Nov-2015	110	7.63	< 0.010	< 0.010	< 2.0	0.0030	**0.0092 [#1]**	0.94	< 0.000020	< 0.0010	0.00043	**2.4 [#1]**	0.00072	---	0.00037	0.0068	0.00072	< 0.00010	< 0.00020	0.00090	0.0063
	12-Mar-2016	110	7.77	< 0.010	< 0.010	**4.1 [#1]**	0.0037	**0.0088 [#1]**	1.0	0.000024	< 0.0010	< 0.00020	**1.6 [#1]**	0.00086	---	0.00064	0.010	0.00082	< 0.00010	< 0.00020	0.00096	0.0083
	05-Aug-2016	100	---	< 0.010	< 0.010	---	0.0034	**0.015 [#1]**	0.95	< 0.000020	< 0.0010	0.00036	**1.8 [#1]**	0.00025	---	0.00050	0.020	0.00028	< 0.00010	< 0.00020	0.00093	0.011
	03-Nov-2016	100	7.84	< 0.010	< 0.010	**4.0 [#1]**	0.0038	0.0025	0.97	0.000038	< 0.0010	0.0026	0.23	0.0029	---	0.0010	0.015	0.00021	< 0.00010	< 0.00020	**0.066 [#1]**	**0.13 [#1]**
	13-Aug-2017	110	---	< 0.010	< 0.010	---	< 0.0030	**0.020 [#1]**	0.95	0.000031	< 0.0010	0.00030	**2.4 [#1]**	0.00049	---	0.00061	0.0088	0.00030	< 0.00010	< 0.00020	0.00078	0.0047
NWR 09-4-5	21-Aug-2013	42	---	0.018	0.0047	**120 [#1]**	0.038	**0.089 [#1]**	0.18	0.000038	0.0013	0.00076	**45 [#1]**	0.0012	---	0.00097	0.011	**0.0013 [#1]**	< 0.00010	< 0.00020	0.00066	0.010
	11-Oct-2013	59	7.56	0.0036	< 0.0030	---	---	---	---	---	---	---	**13 [#1]**	---	---	---	---	---	---	---	---	---
	01-Aug-2014	29	---	< 0.010	< 0.010	**61 [#1]**	0.029	**0.060 [#1]**	0.29	< 0.000020	< 0.0010	0.0016	**27 [#1]**	0.00097	---	0.0011	0.013	**0.0010 [#1]**	< 0.00010	< 0.00020	0.0010	0.011
	31-May-2015	10	6.94	< 0.010	< 0.010	**39 [#1]**	0.026	**0.017 [#1]**	0.068	**0.000099 [#1]**	< 0.0010	0.0024	**14 [#1]**	0.0012	---	0.00021	0.016	0.00072	< 0.00010	< 0.00020	0.00074	0.017
	09-Aug-2015	40	---	< 0.010	< 0.010	**73 [#1]**	0.019	**0.052 [#1]**	0.30	0.000023	< 0.0010	0.0024	**45 [#1]**	0.0017	---	0.00095	0.0077	0.00095	< 0.00010	< 0.00020	0.00066	**0.040 [#1]**
	25-Nov-2015	73	7.10	< 0.010	< 0.010	**27 [#1]**	0.022	**0.049 [#1]**	0.39	< 0.000020	< 0.0010	0.00063	**36 [#1]**	0.00081	---	0.00045	0.010	**0.0016 [#1]**	< 0.00010	< 0.00020	0.00048	**0.030 [#1]**
	05-Aug-2016	14	---	< 0.010	< 0.010	---	0.035	**0.088 [#1]**	0.13	0.000024	0.0012	0.00060	**58 [#1]**	0.0011	---	0.0011	0.010	0.00098	< 0.00010	< 0.00020	0.00050	**0.032 [#1]**
	11-Apr-2017	55	7.51	< 0.010	< 0.010	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	16-Jun-2017	5.1	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**40 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	6.9	---	< 0.050	< 0.050	---	---	---	---	---	---	---	**40 [#1]**	---	---	---	---	---	---	---	---	---
	15-Aug-2017	15	---	< 0.050	< 0.050	---	0.072	**0.12 [#1]**	0.067	< 0.000020	0.0015	0.00048	**88 [#1]**	0.0022	---	0.00067	0.0061	**0.0010 [#1]**	< 0.00010	< 0.00020	0.00019	0.0091
	14-Sep-2017	22	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**68 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	57	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**39 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	72	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**28 [#1]**	---	---	---	---	---	---	---	---	---
NWR 09-5-19	21-Aug-2013	**640 [#1]**	---	0.035	< 0.015	**11 [#1]**	0.0035	**0.039 [#1]**	1.2	0.000033	< 0.0010	0.0010	**1.5 [#1]**	< 0.00020	---	0.0024	0.0059	0.00035	< 0.00010	< 0.00020	0.00034	0.0062
(Duplicate)	21-Aug-2013	**640 [#1]**	---	0.0058	< 0.0030	**32 [#1]**	0.0038	**0.039 [#1]**	1.2	0.000027	< 0.0010	0.00084	**1.4 [#1]**	< 0.00020	---	0.0025	0.0050	0.00033	< 0.00010	< 0.00020	0.00035	0.0041
	08-May-2014	**210 [#1]**	7.51	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	**210 [#1]**	---	0.019	< 0.010	**19 [#1]**	0.0042	**0.034 [#1]**	1.4	< 0.000020	< 0.0010	0.0010	**1.8 [#1]**	< 0.00020	---	0.0022	0.0025	0.00065	< 0.00010	< 0.00020	0.00025	0.0068
(Duplicate)	01-Aug-2014	**380 [#1]**	---	0.035	< 0.010	**18 [#1]**	0.0048	**0.046 [#1]**	**1.6 [#1]**	< 0.000020	< 0.0010	0.0011	**2.1 [#1]**	< 0.00020	---	0.0029	0.0037	0.00039	< 0.00010	< 0.00020	0.00026	0.010
	31-May-2015	110	7.68	< 0.010	< 0.010	**4.7 [#1]**	0.0038	**0.012 [#1]**	0.76	0.000026	< 0.0010	0.00039	**0.50 [#1]**	< 0.00020	---	< 0.00020	0.00094	**0.0022 [#1]**	< 0.00010	< 0.00020	0.00013	< 0.0030
	08-Aug-2015	**420 [#1]**	---	< 0.010	< 0.010	2.7	< 0.0030	**0.035 [#1]**	1.0	< 0.000020	< 0.0010	0.00045	**1.8 [#1]**	< 0.00020	---	0.00048	0.0017	0.00033	< 0.00010	< 0.00020	0.00027	0.0053
(Duplicate)	08-Aug-2015	---	---	---	---	**4.4 [#1]**	< 0.0030	**0.036 [#1]**	1.0	< 0.000020	< 0.0010	0.00030	**1.6 [#1]**	< 0.00020	---	0.00048	0.0016	0.00036	< 0.00010	< 0.00020	0.00025	0.0047
	25-Nov-2015	**730 [#1]**	7.87	< 0.010	< 0.010	**28 [#1]**	< 0.030	**0.037 [#1]**	1.4	**< 0.00020 [#1]**	**< 0.010 [#1]**	< 0.0020	**3.6 [#1]**	< 0.0020	---	< 0.0020	< 0.0050	**< 0.0020 [#1]**	**< 0.0010 [#1]**	**< 0.0020 [#1]**	< 0.0010	< 0.030
	12-Mar-2016	**200 [#1]**	7.64	< 0.010	< 0.010	**15 [#1]**	0.0053	**0.045 [#1]**	1.4	< 0.000020	< 0.0010	< 0.00020	**3.9 [#1]**	< 0.00020	---	0.00024	0.0026	**0.0012 [#1]**	< 0.00010	< 0.00020	0.00023	0.012
	05-Aug-2016	**200 [#1]**	---	< 0.010	< 0.010	---	0.0052	**0.022 [#1]**	0.74	< 0.000020	< 0.0010	0.00091	**1.8 [#1]**	< 0.00020	---	< 0.00020	0.0016	0.00044	< 0.00010	< 0.00020	0.00013	0.0058
	13-Aug-2017	**660 [#1]**	---	< 0.10	**< 0.10 [#1]**	---	0.0036	**0.061 [#1]**	1.1	< 0.000020	< 0.0010	0.00051	**2.4 [#1]**	< 0.00020	---	< 0.00020	0.0013	0.00031	< 0.00010	< 0.00020	0.00024	0.0060
NWR 93-10-6	27-Aug-2001	22.5	7.5	< 0.02	< 0.005	**8 [#1]**	< 0.02	**< 0.05 [#1]**	0.036	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**1.80 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	21-Aug-2002	19.5	7.7	< 0.02	0.005	**17 [#1]**	0.037	0.004	0.040	**< 0.00010 [#1]**	< 0.001	0.0037	**11.4 [#1]**	0.0009	**< 0.00005 [#1]**	0.005	0.012	**0.002 [#1]**	< 0.0001	< 0.0001	0.00318	**0.146 [#1]**
	26-Aug-2003	10	**6.3 [#1]**	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**8.587 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	0.006
	31-May-2015	6.9	7.35	< 0.010	< 0.010	**< 10 [#1]**	0.039	**0.033 [#1]**	0.029	< 0.000020	0.0011	0.00094	**63 [#1]**	0.00021	---	0.022	0.0088	0.00086	< 0.00010	< 0.00020	0.0065	0.0039
	15-Aug-2016	2.2	7.23	< 0.010	< 0.010	**26 [#1]**	0.026	**0.030 [#1]**	0.047	0.000034	< 0.0010	0.0011	**24 [#1]**	0.00034	---	0.021	0.0059	**0.0013 [#1]**	< 0.00010	< 0.00020	0.0033	0.0095

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Inorganic Parameters and Phenols					Dissolved Metals														
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
NWR 93-12-7	07-Sep-1997	---	---	---	---	**38 [#1]**	0.09	**0.0230 [#1]**	0.062	**0.002 [#1]**	0.004	**0.014 [#1]**	**1.19 [#1]**	0.004	**0.00025 [#1]**	0.028	0.015	< 0.0005	**< 0.01 [#1]**	**< 0.02 [#1]**	---	0.027
	09-Sep-1998	14.8	7.7	1.26	0.008	**30 [#1]**	< 0.02	**< 0.04 [#1]**	0.045	**< 0.002 [#1]**	< 0.002	0.002	0.086	**< 0.02 [#1]**	---	0.007	0.011	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	0.006
	15-Sep-1999	26	8.0	< 0.02	< 0.005	**15 [#1]**	0.03	**0.013 [#1]**	0.203	**< 0.0001 [#1]**	0.003	**0.004 [#1]**	0.174	0.001	**< 0.00005 [#1]**	0.014	0.013	**0.002 [#1]**	< 0.0001	**0.02 [#1]**	---	0.007
	17-Sep-2000	32	7.8	0.03	< 0.005	**23 [#1]**	< 0.02	0.001	0.207	**< 0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	0.022	0.001	**< 0.00005 [#1]**	0.031	0.018	**0.001 [#1]**	< 0.0001	**< 0.03 [#1]**	---	0.007
	27-Aug-2001	33.5	7.9	< 0.02	< 0.005	3	0.05	**< 0.05 [#1]**	0.203	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.207	**< 0.03 [#1]**	---	< 0.005	0.010	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
NWR 93-9-7	15-Sep-1999	9.1	8.0	2.69	**0.275 [#1]**	**10 [#1]**	< 0.02	**0.027 [#1]**	0.312	**< 0.0001 [#1]**	0.002	**0.004 [#1]**	0.031	< 0.001	**< 0.00005 [#1]**	< 0.004	0.008	**0.006 [#1]**	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	17-Sep-2000	8.4	7.6	**6.66 [#1]**	**0.336 [#1]**	**17 [#1]**	< 0.02	0.001	0.274	**< 0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	0.008	< 0.001	**< 0.00005 [#1]**	< 0.005	0.008	**0.002 [#1]**	< 0.0001	**< 0.03 [#1]**	---	< 0.005
	27-Aug-2001	8.1	7.7	0.94	**0.063 [#1]**	**4 [#1]**	< 0.02	**< 0.05 [#1]**	0.368	**< 0.002 [#1]**	< 0.005	**0.006 [#1]**	< 0.005	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	21-Aug-2002	7.2	7.7	0.51	0.027	**12 [#1]**	0.002	< 0.001	0.194	**< 0.00010 [#1]**	< 0.001	**0.0120 [#1]**	0.080	0.0005	**0.00106 [#1]**	< 0.005	< 0.008	**0.001 [#1]**	< 0.0001	< 0.0001	**0.0212 [#1]**	0.007
	26-Aug-2003	4	6.8	< 0.2	< 0.06	---	---	< 0.005	0.152	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	0.057	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.003 [#1]**	---	---	**< 1.0 [#1]**	< 0.005
NWR 98-13-21	19-Aug-2012	97	---	0.0056	0.0045	3.5	0.0052	**0.0066 [#1]**	0.42	< 0.000025	< 0.0010	0.00024	**0.55 [#1]**	< 0.00020	---	< 0.00020	0.00064	0.00085	< 0.00010	< 0.00020	< 0.00010	0.0068
(Duplicate)	19-Aug-2012	---	---	---	---	3.1	0.0039	**0.0062 [#1]**	0.42	< 0.000025	< 0.0010	0.00041	**0.55 [#1]**	< 0.00020	---	< 0.00020	0.00064	**0.0010 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0078
	21-Aug-2013	77	---	< 0.0030	< 0.0030	**18 [#1]**	0.0053	0.0035	0.57	0.000030	< 0.0010	0.00079	**0.34 [#1]**	< 0.00020	---	< 0.00020	< 0.00050	**0.0024 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0034
(Duplicate)	21-Aug-2013	76	---	0.0090	< 0.0030	**18 [#1]**	0.0048	0.0039	0.57	< 0.000025	< 0.0010	0.00083	**0.34 [#1]**	< 0.00020	---	< 0.00020	< 0.00050	**0.0019 [#1]**	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	09-May-2014	**330 [#1]**	7.39	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	**210 [#1]**	---	0.028	< 0.010	**13 [#1]**	0.011	0.0019	0.63	< 0.000020	< 0.0010	0.00054	**0.32 [#1]**	< 0.00020	---	< 0.00020	< 0.00050	**0.0038 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0034
(Duplicate)	01-Aug-2014	**210 [#1]**	---	< 0.010	< 0.010	**12 [#1]**	0.0077	0.0020	0.64	< 0.000020	< 0.0010	0.00059	**0.32 [#1]**	< 0.00020	---	< 0.00020	< 0.00050	**0.0052 [#1]**	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	31-May-2015	97	7.52	< 0.010	< 0.010	**4.4 [#1]**	0.0054	0.0012	0.43	< 0.000020	< 0.0010	0.0014	0.18	< 0.00020	---	< 0.00020	0.0013	**0.0020 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0037
	04-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	< 0.00020	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	< 0.00020	---	---	---	---	---	---	---	---
	09-Aug-2015	**180 [#1]**	---	< 0.010	< 0.010	2.2	0.0042	0.0012	0.51	< 0.000020	< 0.0010	0.0035	0.14	< 0.00020	---	< 0.00020	< 0.00050	**0.022 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0053
	25-Nov-2015	**140 [#1]**	7.47	< 0.010	< 0.010	< 4.0	0.0075	0.0016	0.62	< 0.000020	< 0.0010	0.00062	0.13	< 0.00020	---	< 0.00020	< 0.00050	**0.011 [#1]**	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	12-Mar-2016	**150 [#1]**	7.66	< 0.010	< 0.010	2.2	0.013	0.0015	0.61	< 0.000020	< 0.0010	< 0.00020	0.23	< 0.00020	---	< 0.00020	< 0.00050	**0.0056 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0072
	05-Aug-2016	**130 [#1]**	---	< 0.010	< 0.010	---	0.0061	0.0017	0.58	< 0.000020	< 0.0010	0.00058	0.12	< 0.00020	---	< 0.00020	< 0.00050	**0.020 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0033
(Duplicate)	05-Aug-2016	**130 [#1]**	---	< 0.010	< 0.010	---	0.0065	0.0016	0.58	< 0.000020	< 0.0010	0.00063	0.11	< 0.00020	---	< 0.00020	0.00063	**0.018 [#1]**	< 0.00010	< 0.00020	< 0.00010	0.0059
	02-Nov-2016	**140 [#1]**	7.67	< 0.010	< 0.010	**4.5 [#1]**	0.0062	0.0025	0.46	< 0.000020	< 0.0010	< 0.00020	0.071	< 0.00020	---	0.0011	< 0.00050	0.00033	< 0.00010	< 0.00020	0.00075	< 0.0030
	15-Aug-2017	**140 [#1]**	---	< 0.010	< 0.010	---	0.0051	0.0013	0.50	< 0.000020	< 0.0010	0.00057	0.15	< 0.00020	---	< 0.00020	0.00052	**0.0072 [#1]**	< 0.00010	< 0.00020	< 0.00010	< 0.0030
NWR 98-15-6	10-Sep-1998	**1220 [#1]**	7.6	**17.3 [#1]**	**6.54 [#1]**	**67 [#1]**	< 0.02	**0.14 [#1]**	0.095	**< 0.002 [#1]**	0.004	0.002	0.015	**< 0.02 [#1]**	---	0.007	0.012	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	0.005
NWR 98-20-3	09-Sep-1998	**519 [#1]**	7.2	< 0.02	< 0.005	**128 [#1]**	0.03	**0.04 [#1]**	0.733	**< 0.002 [#1]**	< 0.002	< 0.001	**0.387 [#1]**	**< 0.02 [#1]**	---	< 0.004	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	< 0.002
	27-Sep-2000	**440 [#1]**	7.3	< 0.02	0.005	---	< 0.02	**0.07 [#1]**	0.746	**< 0.002 [#1]**	< 0.005	**0.014 [#1]**	0.048	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	**0.075 [#1]**
	26-Aug-2001	**369 [#1]**	7.8	< 0.02	0.005	**108 [#1]**	< 0.02	**< 0.05 [#1]**	0.698	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.740 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2003	**412 [#1]**	7.7	< 0.2	< 0.06	---	---	< 0.005	0.568	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	0.150	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	< 0.005

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals														
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
NWR 98-23-21	15-Sep-1999	**450 [#1]**	8.5	< 0.02	< 0.005	**40 [#1]**	0.02	**0.032 [#1]**	1.06	**< 0.0001 [#1]**	< 0.002	< 0.001	**1.21 [#1]**	< 0.001	**< 0.00005 [#1]**	0.009	< 0.008	**0.001 [#1]**	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	27-Sep-2000	**130 [#1]**	7.4	< 0.02	< 0.005	---	< 0.02	**0.10 [#1]**	0.385	**< 0.002 [#1]**	< 0.005	**0.006 [#1]**	0.229	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	0.015
	26-Aug-2001	**686 [#1]**	8.4	< 0.02	< 0.005	**48 [#1]**	0.04	**< 0.05 [#1]**	1.18	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.780 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2003	**882 [#1]**	7.5	< 0.2	< 0.06	---	---	**0.014 [#1]**	1.267	**0.003 [#1]**	< 0.007	**< 0.009 [#1]**	0.213	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	< 0.005
	20-Aug-2012	77	---	< 0.0060	< 0.0060	**60 [#1]**	0.026	**0.19 [#1]**	0.42	0.000026	0.0015	0.0010	**43 [#1]**	0.0033	---	0.00068	0.0031	0.00074	< 0.00010	< 0.00020	0.00026	0.018
	05-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.00083	---	---	---	---	---	---	---	---
(Duplicate)	05-Jul-2015	---	---	---	---	---	---	---	---	---	---	---	---	0.00073	---	---	---	---	---	---	---	---
NWR 99-19-3	15-Sep-1999	**280 [#1]**	8.2	< 0.02	< 0.005	**324 [#1]**	0.03	**0.013 [#1]**	0.521	**< 0.0001 [#1]**	0.004	< 0.001	**0.566 [#1]**	< 0.001	**< 0.00005 [#1]**	0.007	< 0.008	**0.002 [#1]**	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	17-Sep-2000	**380 [#1]**	7.3	0.02	< 0.005	**324 [#1]**	< 0.02	0.002	0.693	**< 0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	0.128	< 0.001	**< 0.00005 [#1]**	< 0.005	< 0.008	**0.002 [#1]**	< 0.0001	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2001	**387 [#1]**	8.0	< 0.02	< 0.005	**157 [#1]**	< 0.02	**< 0.05 [#1]**	0.643	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**2.03 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
(Duplicate)	26-Aug-2001	**378 [#1]**	7.9	< 0.02	< 0.005	**186 [#1]**	< 0.02	**< 0.05 [#1]**	0.656	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**2.05 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2003	**390 [#1]**	7.2	< 0.2	< 0.06	---	---	< 0.005	0.726	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**3.408 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	< 0.005
NWR 99-21-3	15-Sep-1999	**190 [#1]**	8.2	< 0.02	< 0.005	**14 [#1]**	< 0.02	0.001	0.457	**< 0.0001 [#1]**	< 0.002	< 0.001	**10.0 [#1]**	< 0.001	**< 0.00005 [#1]**	0.007	0.018	**0.002 [#1]**	< 0.0001	**< 0.02 [#1]**	---	0.011
	17-Sep-2000	**150 [#1]**	7.1	0.02	< 0.005	**26 [#1]**	< 0.02	0.003	0.484	**< 0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	**0.405 [#1]**	0.001	**< 0.00005 [#1]**	< 0.005	< 0.008	**0.001 [#1]**	< 0.0001	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2003	**213 [#1]**	6.9	< 0.2	< 0.06	---	---	**0.010 [#1]**	0.709	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**2.795 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.001 [#1]**	---	---	**< 1.0 [#1]**	0.012
NWR 99-22-4	21-Aug-2002	25.6	6.8	< 0.02	< 0.005	**42 [#1]**	0.055	**0.027 [#1]**	0.038	< 0.00001	< 0.001	0.0016	**103 [#1]**	**0.0136 [#1]**	**< 0.00005 [#1]**	< 0.005	< 0.008	**0.002 [#1]**	< 0.0001	< 0.0001	0.00014	**0.189 [#1]**
	26-Aug-2003	25	6.7	< 0.2	< 0.06	---	---	**0.015 [#1]**	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**74.24 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.002 [#1]**	---	---	**< 1.0 [#1]**	0.006
	23-Aug-2004	22	---	< 0.2	**0.07 [#1]**	---	< 0.005	< 0.005	0.043	< 0.000017	< 0.005	**0.016 [#1]**	**87.08 [#1]**	0.002	**< 0.00005 [#1]**	< 0.005	0.035	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	25-Aug-2005	21.8	---	< 0.2	< 0.06	**89 [#1]**	0.0148	**0.0238 [#1]**	0.07	0.00003	< 0.007	**0.007 [#1]**	**57.0 [#1]**	**0.0156 [#1]**	**< 0.00005 [#1]**	< 0.006	0.053	**0.003 [#1]**	0.0001	< 0.0008	0.009	0.018
	20-Aug-2006	17	---	< 0.2	< 0.06	**86 [#1]**	0.009	**0.031 [#1]**	0.09	0.00007	< 0.007	**0.004 [#1]**	**70.2 [#1]**	0.006	**< 0.00005 [#1]**	< 0.006	0.031	< 0.001	< 0.0001	< 0.0008	0.004	0.010
NWR-OBS33	01-Oct-2001	**398 [#1]**	7.3	< 0.02	< 0.005	---	0.05	**< 0.05 [#1]**	0.532	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.142	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	25-Nov-2015	**290 [#1]**	7.51	< 0.010	< 0.010	< 2.0	0.0034	**0.010 [#1]**	0.36	< 0.000020	< 0.0010	0.0019	**1.0 [#1]**	< 0.00020	---	< 0.00020	0.0024	0.00082	< 0.00010	< 0.00020	< 0.00010	0.015
	02-Nov-2016	**330 [#1]**	7.37	< 0.010	< 0.010	**14 [#1]**	0.0043	0.0015	0.43	0.000063	< 0.0010	0.0012	**5.6 [#1]**	< 0.00020	---	0.0031	0.0044	0.00021	< 0.00010	< 0.00020	**0.030 [#1]**	0.0086
NWR-OBS34	01-Oct-2001	**346 [#1]**	7.4	< 0.02	0.006	---	< 0.02	**0.05 [#1]**	0.434	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.187	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	0.015
NWR-OBS37	01-Oct-2001	**321 [#1]**	7.7	0.03	< 0.030	---	0.06	**< 0.05 [#1]**	0.837	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.166	**< 0.03 [#1]**	---	< 0.005	< 0.008	**0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
RB-OBS-52	21-Aug-2012	35	7.72	< 0.0030	0.012	---	---	---	---	---	---	---	**3.0 [#1]**	---	---	---	---	---	---	---	---	---
RB-OBS-46	21-Aug-2012	25	7.37	< 0.0030	0.020	**200 [#1]**	0.069	**0.047 [#1]**	< 0.10	0.000044	0.0043	0.0017	**80 [#1]**	0.0033	---	0.0052	0.031	**0.0032 [#1]**	< 0.00010	< 0.00020	0.0015	0.015
	31-May-2015	15	7.09	< 0.050	< 0.050	**100 [#1]**	0.072	**0.039 [#1]**	0.021	0.000075	0.0038	0.0017	**90 [#1]**	0.0023	---	0.0073	0.022	**0.0030 [#1]**	< 0.00010	< 0.00020	0.00071	0.0063
	25-Nov-2015	15	6.93	< 0.010	0.014	**100 [#1]**	**0.11 [#1]**	**0.065 [#1]**	0.027	0.000032	0.0054	0.0012	**130 [#1]**	0.0032	---	0.0044	0.012	**0.0029 [#1]**	< 0.00010	< 0.00020	0.00024	0.0038
	15-Aug-2016	16	7.02	< 0.010	0.011	**89 [#1]**	0.091	**0.066 [#1]**	0.025	0.000035	0.0046	0.00083	**120 [#1]**	0.0041	---	0.0054	0.022	**0.0024 [#1]**	< 0.00010	< 0.00020	0.00023	0.019
	11-Apr-2017	16	7.34	< 0.050	< 0.050	---	---	---	---	---	---	---	**0.63 [#1]**	---	---	---	---	---	---	---	---	---
	10-May-2017	12	6.93	< 0.010	< 0.010	---	---	---	---	---	---	---	**120 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jun-2017	12	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**110 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	13	---	< 0.050	< 0.050	---	---	---	---	---	---	---	**28 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	13	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**120 [#1]**	---	---	---	---	---	---	---	---	---
	15-Sep-2017	12	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**130 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	15	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**110 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	14	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**23 [#1]**	---	---	---	---	---	---	---	---	---
RB-OBS-49	31-May-2015	14	7.18	< 0.010	< 0.010	**130 [#1]**	0.088	**0.029 [#1]**	0.023	0.000032	0.0020	0.0018	**48 [#1]**	0.0025	---	0.0034	0.027	**0.0014 [#1]**	< 0.00010	< 0.00020	0.0043	< 0.0030
	25-Nov-2015	14	7.35	< 0.010	< 0.010	**140 [#1]**	**0.14 [#1]**	**0.079 [#1]**	0.026	**0.00014 [#1]**	0.0072	**0.0040 [#1]**	**89 [#1]**	0.0039	---	0.0051	0.024	**0.0043 [#1]**	< 0.00010	< 0.00020	0.00094	0.015

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
RB-OBS-48	21-Aug-2012	15	7.71	0.018	0.011	**450 [#1]**	0.033	**0.023 [#1]**	0.042	**0.00018 [#1]**	0.0018	**0.0058 [#1]**	**5.9 [#1]**	**0.013 [#1]**	---	0.0058	0.057	**0.0022 [#1]**	< 0.00010	< 0.00020	0.0073	0.027
	08-May-2014	6.0	7.49	0.097	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	23	7.22	< 0.010	< 0.010	**< 10 [#1]**	0.0091	0.0022	< 0.020	0.000020	< 0.0010	0.0013	**2.5 [#1]**	0.00027	---	0.0042	0.0076	**0.0019 [#1]**	< 0.00010	< 0.00020	0.011	0.013
	15-Aug-2016	7.0	7.49	< 0.010	< 0.010	**7.6 [#1]**	0.028	**0.0065 [#1]**	0.035	0.000023	< 0.0010	0.00076	**19 [#1]**	< 0.00020	---	0.0015	0.0077	**0.0017 [#1]**	< 0.00010	< 0.00020	0.0017	0.0079
RB-OBS-45	21-Aug-2012	24	7.72	0.038	**0.38 [#1]**	**99 [#1]**	0.013	**0.018 [#1]**	0.044	0.000062	< 0.0010	0.00083	**20 [#1]**	0.0020	---	0.0056	0.037	**0.0036 [#1]**	< 0.00010	< 0.00020	0.0088	0.016
	31-May-2015	13	7.14	< 0.010	< 0.010	**61 [#1]**	0.024	**0.014 [#1]**	0.021	0.000027	0.0010	0.0012	**26 [#1]**	0.0011	---	0.0029	0.013	**0.0014 [#1]**	< 0.00010	< 0.00020	0.0014	0.0052
	25-Nov-2015	22	6.98	< 0.010	< 0.010	**98 [#1]**	0.023	**0.030 [#1]**	0.051	**0.00028 [#1]**	0.0018	0.0012	**85 [#1]**	0.0011	---	0.0064	0.013	**0.0022 [#1]**	< 0.00010	< 0.00020	0.0027	0.011
RB-OBS-44	31-May-2015	29	7.26	**18 [#1]**	< 0.010	**9.2 [#1]**	0.0047	0.00049	0.070	**0.00012 [#1]**	< 0.0010	**0.0075 [#1]**	< 0.060	< 0.00020	---	0.00023	0.0029	0.00056	< 0.00010	< 0.00020	**0.024 [#1]**	0.013
RB-OBS-41	21-Aug-2012	18	7.51	0.010	< 0.0030	**130 [#1]**	0.011	**0.0081 [#1]**	0.089	**0.00043 [#1]**	< 0.0010	0.0035	**5.4 [#1]**	0.00027	---	0.0038	0.072	**0.0018 [#1]**	< 0.00010	< 0.00020	0.0077	0.020
	11-Oct-2013	8.4	6.93	< 0.0030	0.0066	---	---	---	---	---	---	---	0.071	---	---	---	---	---	---	---	---	---
	19-Sep-2014	12	7.04	0.014	< 0.010	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
RB-OBS-40	21-Aug-2012	19	7.64	0.019	0.0058	**120 [#1]**	0.016	**0.023 [#1]**	0.030	0.000020	0.0012	0.00029	**63 [#1]**	0.00052	---	0.0028	0.0095	**0.0028 [#1]**	< 0.00010	< 0.00020	0.00065	< 0.0030
(Duplicate)	21-Aug-2012	---	---	---	---	**110 [#1]**	0.017	**0.024 [#1]**	0.027	0.000032	0.0012	0.0013	**64 [#1]**	0.00088	---	0.0028	0.0076	**0.0030 [#1]**	< 0.00010	< 0.00020	0.00053	0.0037
	11-Oct-2013	19	7.17	< 0.0030	0.011	---	---	---	---	---	---	---	**10 [#1]**	---	---	---	---	---	---	---	---	---
	19-Sep-2014	16	7.03	< 0.010	< 0.010	**86 [#1]**	0.041	**0.028 [#1]**	0.028	0.000021	0.0021	0.0037	**65 [#1]**	0.00071	---	0.0077	0.016	**0.0024 [#1]**	< 0.00010	< 0.00020	0.0028	0.0093
RB-OBS-47	21-Aug-2012	21	7.69	< 0.0030	0.011	**140 [#1]**	0.027	**0.035 [#1]**	0.021	0.000025	0.0018	0.0014	**32 [#1]**	0.0046	---	0.0045	0.040	**0.0044 [#1]**	< 0.00010	< 0.00020	0.0043	0.0092
	01-Jun-2015	11	7.46	< 0.010	< 0.010	**31 [#1]**	---	---	---	---	---	---	**1.2 [#1]**	---	---	---	---	---	---	---	---	---
	15-Aug-2016	9.2	7.49	< 0.010	< 0.010	**37 [#1]**	0.019	**0.013 [#1]**	0.036	0.000053	< 0.0010	0.0011	**23 [#1]**	0.0020	---	0.0042	0.025	**0.0022 [#1]**	< 0.00010	< 0.00020	0.0046	0.012
	10-May-2017	14	7.09	< 0.010	< 0.010	---	---	---	---	---	---	---	**11 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	9.3	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**3.0 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Jul-2017	8.8	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**11 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	6.5	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**49 [#1]**	---	---	---	---	---	---	---	---	---
	15-Sep-2017	8.5	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**61 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	9.7	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**64 [#1]**	---	---	---	---	---	---	---	---	---
RB-OBS-50	31-May-2015	6.3	7.34	< 0.010	< 0.010	**22 [#1]**	0.012	**0.033 [#1]**	0.030	0.000042	< 0.0010	**0.0068 [#1]**	**21 [#1]**	0.00049	---	0.0013	0.023	0.00097	< 0.00010	< 0.00020	0.012	0.014
RB-13-1-2.4	11-Oct-2013	53	7.68	0.035	< 0.030	---	---	---	---	---	---	---	**14 [#1]**	---	---	---	---	---	---	---	---	---
	13-Sep-2014	40	7.25	< 0.010	< 0.010	**20 [#1]**	0.031	**0.039 [#1]**	0.25	0.000057	0.0048	0.0015	**29 [#1]**	0.00076	---	0.0035	0.015	0.00068	< 0.00010	< 0.00020	0.0086	0.012
	14-Sep-2017	110	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**42 [#1]**	---	---	---	---	---	---	---	---	---
RB-13-2-2.4	11-Oct-2013	**150 [#1]**	7.72	< 0.0030	0.0066	---	---	---	---	---	---	---	**3.8 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2014	**130 [#1]**	7.36	< 0.010	< 0.010	**18 [#1]**	0.0068	**0.028 [#1]**	0.53	< 0.000020	< 0.0010	0.0018	**28 [#1]**	0.00087	---	0.011	0.018	0.00047	< 0.00010	< 0.00020	0.0058	0.0068
	31-May-2015	37	7.41	< 0.010	< 0.010	3.7	0.0049	0.0026	0.16	< 0.000020	< 0.0010	0.0014	**1.6 [#1]**	< 0.00020	---	0.014	0.013	0.00029	< 0.00010	< 0.00020	**0.018 [#1]**	0.0075
	18-Oct-2015	60	7.13	< 0.010	< 0.010	**10 [#1]**	0.0088	**0.022 [#1]**	0.40	< 0.000020	< 0.0010	0.00033	**25 [#1]**	0.00028	---	0.010	0.016	0.00042	< 0.00010	< 0.00020	0.012	0.0087
	15-Aug-2016	89	7.71	< 0.010	< 0.010	**14 [#1]**	0.010	**0.035 [#1]**	0.59	0.000030	< 0.0010	0.00031	**22 [#1]**	0.00036	---	0.0033	0.020	**0.0011 [#1]**	< 0.00010	< 0.00020	0.0025	0.015
	01-Oct-2016	---	7.40	---	---	**12 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	**170 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**9.4 [#1]**	---	---	---	---	---	---	---	---	---
RB-13-3-2.4	11-Oct-2013	**340 [#1]**	7.91	1.5	**0.61 [#1]**	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	14-Sep-2014	**310 [#1]**	7.54	< 0.010	< 0.010	**16 [#1]**	0.0070	**0.020 [#1]**	0.69	< 0.000020	< 0.0010	0.0014	**16 [#1]**	< 0.00020	---	0.012	0.0088	0.00049	< 0.00010	< 0.00020	0.0030	0.023
	15-Aug-2016	**230 [#1]**	7.68	< 0.010	< 0.010	**9.0 [#1]**	0.0088	**0.013 [#1]**	0.56	0.000062	< 0.0010	0.0010	**9.5 [#1]**	< 0.00020	---	0.0053	0.018	0.00061	< 0.00010	< 0.00020	0.0053	**4.0 [#1]**
	01-Oct-2016	---	7.54	---	---	**13 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-4-3	11-Oct-2013	**280 [#1]**	**10.1 [#1]**	< 0.015	< 0.015	---	---	---	---	---	---	---	**0.47 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2014	**120 [#1]**	8.40	< 0.010	< 0.010	**8.8 [#1]**	0.032	0.0033	0.71	< 0.000020	< 0.0010	0.0010	< 0.060	< 0.00020	---	0.020	0.0036	0.00034	< 0.00010	< 0.00020	0.00026	0.0077
	18-Oct-2015	**230 [#1]**	8.76	< 0.010	< 0.010	**19 [#1]**	0.036	**0.017 [#1]**	1.4	< 0.000020	< 0.0010	0.00033	0.093	< 0.00020	---	0.020	0.0050	0.00049	< 0.00010	< 0.00020	0.0019	0.0052
	01-Oct-2016	---	8.13	---	---	**6.9 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	**180 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**0.56 [#1]**	---	---	---	---	---	---	---	---	---

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals														
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
RB-13-5-2.4	11-Oct-2013	**160 [#1]**	7.77	0.055	0.013	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	14-Sep-2014	**180 [#1]**	7.65	< 0.010	< 0.010	**4.2 [#1]**	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	18-Oct-2015	**190 [#1]**	7.15	< 0.010	< 0.010	**7.0 [#1]**	0.0047	0.00080	0.083	**0.0010 [#1]**	< 0.0010	0.00068	**1.6 [#1]**	< 0.00020	---	0.0024	0.024	0.00027	< 0.00010	< 0.00020	0.0065	**1.7 [#1]**
	15-Aug-2016	73	7.66	0.053	< 0.010	**4.6 [#1]**	0.0056	0.00083	0.053	**0.00020 [#1]**	< 0.0010	0.0015	< 0.060	< 0.00020	---	0.0025	0.013	0.00056	< 0.00010	< 0.00020	0.0040	**1.2 [#1]**
	01-Oct-2016	---	7.49	---	---	3.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-6-2.4	11-Oct-2013	**200 [#1]**	7.99	**3.0 [#1]**	**0.58 [#1]**	---	---	---	---	---	---	---	0.10	---	---	---	---	---	---	---	---	---
	13-Sep-2014	**180 [#1]**	8.03	0.011	< 0.010	**23 [#1]**	0.0099	**0.019 [#1]**	0.48	< 0.000020	< 0.0010	**0.0050 [#1]**	**11 [#1]**	< 0.00020	---	0.022	0.0099	0.00056	< 0.00010	< 0.00020	0.0018	**0.36 [#1]**
	19-Oct-2015	**140 [#1]**	7.38	< 0.010	< 0.010	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	15-Aug-2016	**140 [#1]**	7.49	0.010	0.011	**20 [#1]**	0.013	**0.017 [#1]**	0.30	0.000036	< 0.0010	0.00064	**12 [#1]**	0.00023	---	0.013	0.011	0.00080	< 0.00010	< 0.00020	0.0049	**2.3 [#1]**
	01-Oct-2016	---	7.63	---	---	**19 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-13-7-1.5	11-Oct-2013	**160 [#1]**	7.92	0.0044	0.0044	---	---	---	---	---	---	---	0.076	---	---	---	---	---	---	---	---	---
	13-Sep-2014	**150 [#1]**	8.17	< 0.010	< 0.010	**36 [#1]**	---	---	---	---	---	---	**0.82 [#1]**	---	---	---	---	---	---	---	---	---
RB-13-8-1.5	11-Oct-2013	**160 [#1]**	7.92	0.36	0.0085	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	19-Oct-2015	**170 [#1]**	7.68	0.17	< 0.010	**15 [#1]**	**0.12 [#1]**	0.00059	0.049	**0.00038 [#1]**	< 0.0010	0.0027	**0.42 [#1]**	0.00043	---	0.0031	0.0094	0.00029	< 0.00010	< 0.00020	0.0047	**0.59 [#1]**
	15-Aug-2016	**200 [#1]**	7.83	< 0.010	< 0.010	**19 [#1]**	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	01-Oct-2016	---	7.96	---	---	**4.0 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-01	16-Jun-2017	19	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**66 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	25	---	0.014	< 0.010	---	---	---	---	---	---	---	**0.50 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	18	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**89 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	16	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**95 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	16	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**96 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	18	---	0.062	< 0.010	---	---	---	---	---	---	---	**33 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-02	16-Jun-2017	32	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**11 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	31	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**1.2 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	26	---	0.053	**0.15 [#1]**	---	---	---	---	---	---	---	**20 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	22	---	< 0.010	0.027	---	---	---	---	---	---	---	**28 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	17	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**27 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	25	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**23 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-03	16-Jun-2017	56	---	0.018	< 0.010	---	---	---	---	---	---	---	**7.9 [#1]**	---	---	---	---	---	---	---	---	---
	16-Jul-2017	32	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**0.92 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	28	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**24 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	23	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**26 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	17	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**29 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	26	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**29 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-04	15-Jun-2017	88	---	0.024	< 0.010	---	---	---	---	---	---	---	**2.6 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	63	---	0.012	< 0.010	---	---	---	---	---	---	---	0.30 [#1]	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Jul-2017	61	---	0.012	< 0.010	---	---	---	---	---	---	---	0.28	---	---	---	---	---	---	---	---	---
	19-Aug-2017	14	---	0.017	< 0.010	---	---	---	---	---	---	---	0.066	---	---	---	---	---	---	---	---	---
	14-Sep-2017	20	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**5.8 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	14-Sep-2017	20	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**5.8 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	19	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**8.5 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	23	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**8.8 [#1]**	---	---	---	---	---	---	---	---	---

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
RB-MW17-05	15-Jul-2017	6.9	---	0.71	**0.12 [#1]**	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	19-Aug-2017	2.5	---	0.19	0.028	---	---	---	---	---	---	---	**0.93 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	5.6	---	0.040	**0.061 [#1]**	---	---	---	---	---	---	---	**18 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-06	16-Jun-2017	16	---	0.11	< 0.010	---	---	---	---	---	---	---	0.16	---	---	---	---	---	---	---	---	---
	15-Jul-2017	19	---	0.072	0.011	---	---	---	---	---	---	---	0.19	---	---	---	---	---	---	---	---	---
	19-Aug-2017	10	---	0.012	< 0.010	---	---	---	---	---	---	---	**32 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	7.7	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**78 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	7.7	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**61 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	7.4	---	0.011	< 0.010	---	---	---	---	---	---	---	**76 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-07	16-Jun-2017	97	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**11 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	86	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**0.76 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	38	---	0.11	0.012	---	---	---	---	---	---	---	0.077	---	---	---	---	---	---	---	---	---
	14-Sep-2017	36	---	0.12	< 0.010	---	---	---	---	---	---	---	0.077	---	---	---	---	---	---	---	---	---
	14-Oct-2017	44	---	0.023	< 0.010	---	---	---	---	---	---	---	**6.3 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	87	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**19 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-08	16-Jun-2017	77	---	0.015	< 0.010	---	---	---	---	---	---	---	**9.7 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	76	---	0.017	< 0.010	---	---	---	---	---	---	---	**1.9 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	56	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**23 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2017	55	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**23 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	39	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**26 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	44	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**19 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	62	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**26 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-09	16-Jun-2017	46	---	0.032	< 0.010	---	---	---	---	---	---	---	**20 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Jun-2017	46	---	0.032	< 0.010	---	---	---	---	---	---	---	**20 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	47	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**1.7 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	43	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**22 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	43	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**27 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	36	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**17 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	26	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**40 [#1]**	---	---	---	---	---	---	---	---	---
RB-MW17-10	23-Nov-2017	52	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**28 [#1]**	---	---	---	---	---	---	---	---	---
RB-OBS32	23-Aug-2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	15	7.18	< 0.010	< 0.010	**< 100 [#1]**	0.0065	**0.0061 [#1]**	0.29	< 0.000020	< 0.0010	0.00073	**1.6 [#1]**	0.00039	---	< 0.00020	0.0044	**0.0013 [#1]**	< 0.00010	< 0.00020	0.0014	0.010
RB-OBS33	12-Mar-2016	**370 [#1]**	7.30	< 0.010	< 0.010	**< 10 [#1]**	0.0064	**0.018 [#1]**	0.37	< 0.000020	< 0.0010	0.0011	**4.8 [#1]**	< 0.00020	---	0.00037	0.0022	0.00077	< 0.00010	< 0.00020	< 0.00010	0.013
RB-OBS35	01-Oct-2001	**309 [#1]**	7.7	< 0.02	0.014	---	< 0.02	**0.06 [#1]**	0.863	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.106	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	05-Feb-2003	**246 [#1]**	7.8	< 0.2	**< 0.3 [#1]**	---	---	---	---	---	---	---	**1.075 [#1]**	---	---	---	---	---	---	---	---	---
RB-OBS36	01-Oct-2001	**338 [#1]**	7.5	< 0.02	0.009	---	< 0.02	**< 0.05 [#1]**	0.654	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.146	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
RB-OBS38	01-Oct-2001	**347 [#1]**	7.6	< 0.02	0.007	---	< 0.02	**< 0.05 [#1]**	0.518	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.118	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	05-Feb-2003	**307 [#1]**	7.9	< 0.2	**< 0.3 [#1]**	---	---	---	---	---	---	---	**0.559 [#1]**	---	---	---	---	---	---	---	---	---
RB-OBS39	05-Feb-2003	**274 [#1]**	7.9	< 0.2	**< 0.3 [#1]**	---	---	---	---	---	---	---	**1.298 [#1]**	---	---	---	---	---	---	---	---	---
	31-May-2015	80	7.38	< 0.010	0.014	**< 100 [#1]**	0.0043	**0.015 [#1]**	0.52	< 0.000020	< 0.0010	0.00074	**4.2 [#1]**	0.00044	---	0.00037	0.0025	0.00047	< 0.00010	< 0.00020	0.00080	0.0043
RB-RW-1	05-Mar-2003	112	7.6	< 0.2	**< 0.3 [#1]**	---	---	---	---	---	---	---	0.095	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
		Inorganic Parameters and Phenols					Dissolved Metals															
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
RB-RW-10	11-Oct-2013	110	7.30	< 0.0030	< 0.0030	---	---	---	---	---	---	---	**0.85 [#1]**	---	---	---	---	---	---	---	---	---
	15-Aug-2016	94	7.53	< 0.010	< 0.010	**30 [#1]**	0.0071	**0.029 [#1]**	0.59	< 0.000020	< 0.0010	0.00094	**4.6 [#1]**	0.00039	---	0.00023	0.0010	**0.0024 [#1]**	< 0.00010	< 0.00020	0.00027	0.0095
RB-RW-12	01-Jun-2015	7.5	7.44	< 0.010	< 0.010	**16 [#1]**	0.0069	0.0026	0.026	**0.00018 [#1]**	< 0.0010	0.0036	**1.9 [#1]**	< 0.00020	---	0.0073	0.015	0.00055	< 0.00010	< 0.00020	0.0093	**1.3 [#1]**
	15-Aug-2016	12	7.47	0.013	< 0.010	**62 [#1]**	0.021	**0.015 [#1]**	0.030	0.000070	0.0013	0.00058	**22 [#1]**	0.00062	---	0.0047	0.013	**0.0014 [#1]**	< 0.00010	< 0.00020	0.00087	**0.035 [#1]**
RB-RW-13	01-Jun-2015	7.2	7.24	< 0.010	< 0.010	**190 [#1]**	0.0055	**0.0079 [#1]**	0.036	< 0.000020	< 0.0010	0.0011	**4.2 [#1]**	< 0.00020	---	0.00061	0.0082	< 0.00020	< 0.00010	< 0.00020	0.0036	0.026
	15-Mar-2017	26	7.40	< 0.010	< 0.010	---	---	---	---	---	---	---	**11 [#1]**	---	---	---	---	---	---	---	---	---
	11-Apr-2017	50	7.55	< 0.010	< 0.010	---	---	---	---	---	---	---	**6.8 [#1]**	---	---	---	---	---	---	---	---	---
	10-May-2017	48	7.54	< 0.010	< 0.010	---	---	---	---	---	---	---	**4.0 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jun-2017	8.6	---	0.51	0.029	---	---	---	---	---	---	---	**0.32 [#1]**	---	---	---	---	---	---	---	---	---
	(Duplicate) 15-Jun-2017	8.3	---	0.49	0.019	---	---	---	---	---	---	---	**0.34 [#1]**	---	---	---	---	---	---	---	---	---
	16-Jul-2017	12	---	< 0.010	< 0.010	---	---	---	---	---	---	---	0.096	---	---	---	---	---	---	---	---	---
	19-Aug-2017	11	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**0.76 [#1]**	---	---	---	---	---	---	---	---	---
	15-Sep-2017	15	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**0.35 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	20	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**12 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	11	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**6.9 [#1]**	---	---	---	---	---	---	---	---	---
RB-RW-2	05-Mar-2003	**122 [#1]**	7.7	< 0.2	**< 0.3 [#1]**	---	---	---	---	---	---	---	0.117	---	---	---	---	---	---	---	---	---
RB-RW-3	01-Jun-2015	11	7.35	< 0.010	< 0.010	**36 [#1]**	0.029	**0.024 [#1]**	0.030	0.000031	0.0016	**0.0041 [#1]**	**9.4 [#1]**	0.0011	---	0.0033	0.026	**0.0015 [#1]**	< 0.00010	< 0.00020	0.0026	0.0055
RB-RW-4	31-May-2015	9.1	7.41	< 0.010	< 0.010	**12 [#1]**	0.011	**0.0076 [#1]**	0.021	0.000032	< 0.0010	0.0010	**2.9 [#1]**	0.00071	---	0.00084	0.0093	0.00071	< 0.00010	< 0.00020	0.0033	0.0046
	25-Nov-2015	20	7.20	< 0.010	< 0.010	**79 [#1]**	0.050	**0.062 [#1]**	0.030	< 0.000020	0.0023	0.00046	**63 [#1]**	0.0010	---	0.0011	0.014	**0.0024 [#1]**	< 0.00010	< 0.00020	0.0021	0.0042
	15-Aug-2016	17	7.39	< 0.010	< 0.010	**38 [#1]**	0.012	**0.039 [#1]**	0.034	< 0.000020	< 0.0010	< 0.00020	**20 [#1]**	0.00085	---	0.00091	0.0075	**0.0019 [#1]**	< 0.00010	< 0.00020	0.0014	0.0064
RB-RW-5	11-Oct-2013	25	6.95	0.093	0.0031	---	---	---	---	---	---	---	0.17	---	---	---	---	---	---	---	---	---
	19-Sep-2014	25	6.85	< 0.010	< 0.010	**16 [#1]**	0.010	**0.076 [#1]**	0.092	< 0.000020	0.0012	0.00069	**46 [#1]**	0.0014	---	0.00043	0.0029	0.00061	< 0.00010	< 0.00020	0.0074	0.0042
	25-Nov-2015	24	7.29	< 0.010	< 0.010	**92 [#1]**	0.0076	**0.11 [#1]**	0.10	< 0.000020	< 0.0010	0.00077	**40 [#1]**	0.00024	---	0.00026	0.0016	**0.0016 [#1]**	< 0.00010	< 0.00020	0.0053	0.010
	02-Nov-2016	24	7.43	< 0.010	< 0.010	**35 [#1]**	< 0.0030	0.00080	0.11	< 0.000020	< 0.0010	< 0.00020	**16 [#1]**	< 0.00020	---	0.00069	< 0.00050	**0.0013 [#1]**	< 0.00010	< 0.00020	0.00072	< 0.0030
	15-Mar-2017	25	7.40	0.014	< 0.010	---	---	---	---	---	---	---	**0.87 [#1]**	---	---	---	---	---	---	---	---	---
	11-Apr-2017	25	7.53	< 0.010	< 0.010	---	---	---	---	---	---	---	**6.5 [#1]**	---	---	---	---	---	---	---	---	---
	10-May-2017	22	7.40	0.017	< 0.010	---	---	---	---	---	---	---	**12 [#1]**	---	---	---	---	---	---	---	---	---
	16-Jun-2017	20	---	1.9	**0.088 [#1]**	---	---	---	---	---	---	---	**0.91 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jul-2017	21	---	< 0.010	< 0.010	---	---	---	---	---	---	---	0.075	---	---	---	---	---	---	---	---	---
	19-Aug-2017	23	---	0.016	< 0.010	---	---	---	---	---	---	---	**46 [#1]**	---	---	---	---	---	---	---	---	---
	15-Sep-2017	24	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**2.8 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	24	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**26 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	22	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**39 [#1]**	---	---	---	---	---	---	---	---	---
RB-RW-6	11-Oct-2013	20	7.36	< 0.0030	0.0034	---	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	19-Sep-2014	20	7.01	< 0.010	< 0.010	**12 [#1]**	0.0050	0.0034	0.26	< 0.000020	< 0.0010	< 0.00020	**1.4 [#1]**	0.00066	---	< 0.00020	0.0013	**0.0040 [#1]**	< 0.00010	< 0.00020	0.0023	0.0031
	25-Nov-2015	16	7.17	< 0.010	< 0.010	**7.9 [#1]**	0.0039	0.00070	0.22	< 0.000020	< 0.0010	0.0014	**0.98 [#1]**	< 0.00020	---	0.00039	0.0042	**0.0044 [#1]**	< 0.00010	< 0.00020	0.0059	0.0031
	15-Aug-2016	21	7.30	0.30	0.031	**5.4 [#1]**	0.0071	0.0045	0.23	< 0.000020	< 0.0010	0.0011	**2.8 [#1]**	0.00066	---	0.0011	0.0039	**0.0017 [#1]**	< 0.00010	< 0.00020	0.0043	0.015

Advisian
WorleyParsons Group

Table 3
Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
RB-RW-8	11-Oct-2013	9.2	7.09	0.0030	0.0063	---	---	---	---	---	---	---	**5.7 [#1]**	---	---	---	---	---	---	---	---	---
	19-Sep-2014	6.4	6.87	< 0.010	< 0.010	**25 [#1]**	0.019	**0.028 [#1]**	0.067	0.000020	0.0012	0.0013	**12 [#1]**	0.0051	---	0.0022	0.015	0.00098	< 0.00010	< 0.00020	0.0031	**0.29 [#1]**
	01-Jun-2015	3.0	7.64	< 0.010	< 0.010	3.4	0.0046	**0.0050 [#1]**	< 0.020	0.000025	< 0.0010	0.0022	**0.51 [#1]**	< 0.00020	---	0.0052	0.0045	0.00024	< 0.00010	< 0.00020	0.0024	**0.17 [#1]**
	15-Aug-2016	57	7.51	< 0.010	0.013	**20 [#1]**	0.0093	**0.086 [#1]**	0.40	< 0.000020	< 0.0010	0.00059	**10 [#1]**	0.00061	---	0.0012	0.0067	0.00096	< 0.00010	< 0.00020	0.0020	**0.037 [#1]**
	15-Mar-2017	70	7.60	< 0.010	< 0.010	---	---	---	---	---	---	---	**4.1 [#1]**	---	---	---	---	---	---	---	---	---
	11-Apr-2017	81	7.51	< 0.010	< 0.010	---	---	---	---	---	---	---	**15 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	11-Apr-2017	82	7.50	< 0.010	< 0.010	---	---	---	---	---	---	---	**14 [#1]**	---	---	---	---	---	---	---	---	---
	10-May-2017	3.4	7.55	0.11	0.033	---	---	---	---	---	---	---	**0.34 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	10-May-2017	3.6	7.57	0.13	0.035	---	---	---	---	---	---	---	**0.32 [#1]**	---	---	---	---	---	---	---	---	---
	16-Jul-2017	3.4	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**1.0 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	4.1	---	0.12	**0.061 [#1]**	---	---	---	---	---	---	---	**18 [#1]**	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2017	4.0	---	0.068	0.039	---	---	---	---	---	---	---	**18 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	2.9	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**20 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	4.9	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**75 [#1]**	---	---	---	---	---	---	---	---	---
	22-Nov-2017	4.3	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**74 [#1]**	---	---	---	---	---	---	---	---	---
RB-RW-9	11-Oct-2013	22	7.16	< 0.0030	< 0.0030	---	---	---	---	---	---	---	**16 [#1]**	---	---	---	---	---	---	---	---	---
	19-Sep-2014	70	6.84	< 0.010	< 0.010	**140 [#1]**	0.025	**0.025 [#1]**	0.038	0.000065	0.0016	0.00062	**65 [#1]**	0.0054	---	0.0017	0.017	**0.0051 [#1]**	< 0.00010	< 0.00020	0.0024	0.0048
	01-Jun-2015	3.7	7.31	0.48	< 0.010	**9.6 [#1]**	0.0040	0.0014	0.084	**0.00016 [#1]**	< 0.0010	**0.0041 [#1]**	0.25	0.00041	---	0.00055	0.0088	0.00099	< 0.00010	< 0.00020	0.0044	**0.079 [#1]**
	15-Aug-2016	21	7.28	< 0.10	**< 0.10 [#1]**	**140 [#1]**	0.016	**0.021 [#1]**	0.036	0.000081	0.0012	0.0012	**61 [#1]**	0.0018	---	0.0016	0.014	**0.0048 [#1]**	< 0.00010	< 0.00020	0.00024	0.027
	15-Mar-2017	24	7.37	< 0.010	< 0.010	---	---	---	---	---	---	---	**23 [#1]**	---	---	---	---	---	---	---	---	---
	11-Apr-2017	24	7.37	< 0.010	< 0.010	---	---	---	---	---	---	---	**43 [#1]**	---	---	---	---	---	---	---	---	---
	10-May-2017	4.0	7.37	< 0.010	< 0.010	---	---	---	---	---	---	---	**5.2 [#1]**	---	---	---	---	---	---	---	---	---
	15-Jun-2017	3.8	---	0.032	< 0.010	---	---	---	---	---	---	---	0.10	---	---	---	---	---	---	---	---	---
	16-Jul-2017	9.0	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**1.2 [#1]**	---	---	---	---	---	---	---	---	---
	19-Aug-2017	12	---	0.34	0.048	---	---	---	---	---	---	---	**52 [#1]**	---	---	---	---	---	---	---	---	---
	14-Sep-2017	14	---	0.034	< 0.010	---	---	---	---	---	---	---	**61 [#1]**	---	---	---	---	---	---	---	---	---
	14-Oct-2017	17	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**62 [#1]**	---	---	---	---	---	---	---	---	---
	23-Nov-2017	18	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**56 [#1]**	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 01-29-7	26-Aug-2001	**3.7** [#1]	**0.012** [#1]	0.014	1.21	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Oct-2011	0.21	0.0008	< 0.0004	0.17	11	250	---	---	---	---	---	---	---	---	---	---	---
	05-Jul-2015	0.17	< 0.0040 [#1]	< 0.0040	0.16	3.8	29	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	05-Jul-2015	0.13	0.00047	0.0012	0.15	7.8	200	---	---	---	---	---	---	---	---	---	---	---
NWR 01-30-4	20-Aug-2006	0.0594	< 0.0005	< 0.0005	0.057	0.298	0.6	---	---	---	---	---	---	---	---	---	---	---
NWR 01-31-4	21-Aug-2002	0.049	< 0.01 [#1]	< 0.01	0.11	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	0.109	< 0.0050 [#1]	0.0098	0.163	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	0.0968	0.0010	0.0043	0.2522	1.9	103	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.0141	< 0.0005	0.0025	0.0752	0.22	0.9	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	0.0036	< 0.0005	< 0.0005	0.01	0.296	3.8	---	---	---	---	---	---	---	---	---	---	---
NWR 01-32-4	26-Aug-2001	0.061	**0.0082** [#1]	0.066	0.44	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	0.0797	< 0.0005	0.0015	0.01	0.305	35.0	---	---	---	---	---	---	---	---	---	---	---
NWR 01-33-4	26-Aug-2001	**2.2** [#1]	**1** [#1]	**0.24** [#1]	1.35	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	**2.07** [#1]	**0.35** [#1]	**0.11** [#1]	1.13	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**2.76** [#1]	**0.0594** [#1]	**0.177** [#1]	1.12	0.2	14.5	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	0.0112	< 0.0005	< 0.0005	0.002	0.409	15.0	---	---	---	---	---	---	---	---	---	---	---
NWR 01-34-2	22-Aug-2002	0.072	< 0.0050 [#1]	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	0.328	< 0.0050 [#1]	< 0.0050	0.170	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**0.379** [#1]	< 0.0050 [#1]	< 0.0050	0.0909	0.1	0.9	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.0614	< 0.0005	0.0032	0.0289	0.39	0.9	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	0.8	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	0.7	---	---	---	---	---	---	---	---	---	---	---
NWR 02-12-7	26-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.2	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	< 0.0004	0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---	---
NWR 03-35-5	25-Aug-2005	**1.59** [#1]	< 0.05 [#1]	< 0.05	0.752	1.3	4.6	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	**0.417** [#1]	< 0.005 [#1]	< 0.005	0.066	1.48	7.1	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2007	0.118	< 0.0004	< 0.0004	0.0108	0.519	4.1	---	---	---	---	---	---	---	---	---	---	---
NWR 03-37-4	23-Aug-2004	**0.955** [#1]	< 0.0050 [#1]	< 0.0050	0.393	< 0.1	0.6	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.206	< 0.005 [#1]	< 0.005	0.012-0.017	0.68	7.7	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 03-38-3	26-Aug-2003	0.0027	< 0.0005	< 0.0005	.0131-0.013	---	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.1	0.3	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.1	0.3	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---	---
NWR 03-39-4	26-Aug-2003	0.0006	< 0.0005	< 0.0005	.0027-0.003	---	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	0.0013	< 0.0005	< 0.0005	.0023-0.002	0.2	0.3	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---	---
NWR 03-40-2	26-Aug-2003	**3.18** [#1]	**3.47** [#1]	**0.552** [#1]	2.31	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR 03-41-17	20-Aug-2006	0.0142	< 0.0005	< 0.0005	0.002	0.229	129	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2007	0.0170	< 0.0004	< 0.0004	0.0029	2.54	81.2	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.023	< 0.0004	< 0.0004	0.0086	0.85	28.5	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	0.04	< 0.0004	< 0.0004	0.0039	0.44	5.9	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	0.095	< 0.0004	< 0.0004	0.0042	0.16	2.9	---	---	---	---	---	---	---	---	---	---	---
NWR 03-42-19	21-Aug-2007	0.0181	< 0.0004	< 0.0004	0.0768	0.728	3.2	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.0030	< 0.0004	< 0.0004	0.0081	2	17.0	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	**0.46** [#1]	**0.014** [#1]	0.011	0.25	2.9	14.3	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	0.07	**0.0021** [#1]	0.0032	0.086	0.28	2.9	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2011	0.13	**0.0090** [#1]	0.013	0.23	0.34	13	---	---	---	---	---	---	---	---	---	---	---
NWR 03-43-20	19-Aug-2008	0.016	< 0.0004	0.0029	0.058	0.46	2.7	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	**0.67** [#1]	**0.034** [#1]	0.023	0.26	0.97	2.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	0.044	< 0.0004	0.0005	0.011	< 0.1	4.1	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2011	0.058	0.0007	0.0012	0.02	< 0.1	0.9	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2012	**0.76** [#1]	**0.0035** [#1]	0.018	0.4	1.7	0.80	---	---	---	---	---	---	---	---	---	---	---
NWR 09-1-2	17-Aug-2009	0.019	**0.016** [#1]	0.014	0.079	0.66	4.2	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000040	0.00089	**0.0050** [#1]	**0.0015** [#1]	**0.000058** [#1]	---
NWR 09-1-20	25-Aug-2013	0.024	< 0.00040	< 0.00040	< 0.00080	0.58	11	---	---	---	---	---	---	---	---	---	---	---
	08-May-2014	0.098	< 0.00040	< 0.00040	0.0037	0.21	2.6	0.00013	---	< 0.000010	< 0.000019 [#1]	< 0.0000075	0.000026	0.00048	**0.0025** [#1]	**0.0011** [#1]	**0.00011** [#1]	---
	01-Aug-2014	0.073	< 0.00040	< 0.00040	0.0028	0.41	27	< 0.00033	---	< 0.000010	< 0.000074 [#1]	< 0.000020 [#1]	**0.000058** [#1]	0.0012	**0.0038** [#1]	**0.0032** [#1]	**0.00030** [#1]	---
	31-May-2015	0.059	< 0.00040	< 0.00040	0.0028	0.33	7.6	0.00096	---	< 0.000010	**0.000094** [#1]	**0.000077** [#1]	**0.000069** [#1]	0.0017	**0.0066** [#1]	**0.0039** [#1]	**0.00018** [#1]	---
	05-Jul-2015	0.065	< 0.00040	< 0.00040	0.0026	0.17	4.9	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	05-Jul-2015	0.063	< 0.00040	< 0.00040	0.0027	0.1	5.1	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2015	0.035	< 0.00040	< 0.00040	0.0018	0.34	5.3	< 0.00010	---	< 0.000010	**0.000031** [#1]	**0.000037** [#1]	0.000030	< 0.000050	**0.0043** [#1]	**0.0012** [#1]	**0.000070** [#1]	---
	25-Nov-2015	0.038	< 0.00040	< 0.00040	0.0024	0.16	20	0.00061	---	< 0.000010	**0.00011** [#1]	**0.000029** [#1]	**0.000089** [#1]	0.0022	**0.0058** [#1]	**0.0047** [#1]	**0.00049** [#1]	---
(Duplicate)	25-Nov-2015	0.041	< 0.00040	< 0.00040	0.0024	< 0.1	0.53	---	---	---	---	---	---	---	---	---	---	---
	12-Mar-2016	0.039	< 0.00040	< 0.00040	0.0014	0.54	5.6	0.00021	---	< 0.000010	**0.000055** [#1]	< 0.0000075	< 0.000010	0.00068	**0.0034** [#1]	**0.0012** [#1]	**0.00015** [#1]	---
	05-Aug-2016	< 0.0040	< 0.0040 [#1]	< 0.0040	< 0.0080	3.9	130	0.00016	---	< 0.000010	**0.000028** [#1]	< 0.0000075	0.000021	0.00062	**0.0037** [#1]	**0.0012** [#1]	**0.00011** [#1]	---
	03-Nov-2016	0.17	< 0.00040	< 0.00040	0.0071	< 0.10	47	< 0.00027	---	**0.000034** [#1]	< 0.000023 [#1]	< 0.000020 [#1]	< 0.000027	0.00046	**0.0019** [#1]	**0.00073** [#1]	**0.00016** [#1]	---
	13-Aug-2017	0.0076	< 0.00040	< 0.00040	< 0.00080	0.34	1.2	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00022	**0.0020** [#1]	0.00034	< 0.000020	< 0.00020

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 09-2-2	17-Aug-2009	**0.43** [#1]	0.0012	0.014	0.43	2.1	37.2	0.0013	---	< 0.00010 [#1]	**0.00010** [#1]	**0.00017** [#1]	< 0.00040 [#1]	**0.0078** [#1]	**0.099** [#1]	**0.0085** [#1]	**0.00031** [#1]	---
NWR 09-2-26	25-Aug-2013	**0.96** [#1]	**0.0021** [#1]	**0.29** [#1]	0.65	2.6	3.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2013	**0.97** [#1]	**0.0022** [#1]	**0.28** [#1]	0.65	3.1	3.0	---	---	---	---	---	---	---	---	---	---	---
	08-May-2014	**0.66** [#1]	0.00043	**0.19** [#1]	0.42	1.5	1.6	0.00019	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00052	**0.055** [#1]	**0.00042** [#1]	0.000024	---
	01-Aug-2014	0.28	0.00091	0.027	0.14	3	4.7	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Aug-2014	**0.39** [#1]	**0.0074** [#1]	0.026	0.19	0.8	5.0	---	---	---	---	---	---	---	---	---	---	---
	01-Jun-2015	**0.65** [#1]	**0.027** [#1]	0.018	0.29	2.3	1.7	0.00018	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00029	**0.02** [#1]	0.00022	< 0.000020	---
	04-Jul-2015	**0.83** [#1]	**0.074** [#1]	0.00065	0.36	2.4	1.8	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	**0.79** [#1]	**0.068** [#1]	< 0.00040	0.34	2.1	1.6	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2015	0.15	**0.0046** [#1]	< 0.00040	0.032	0.33	1.8	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	0.061	0.00060	< 0.00040	0.0034	0.17	0.16	< 0.00010	---	0.000011	< 0.0000085	0.0000087	0.000014	0.000060	**0.0014** [#1]	0.00013	0.000023	---
	12-Mar-2016	**0.52** [#1]	**0.015** [#1]	0.00098	0.14	15	32	0.00011	---	< 0.000034 [#1]	**0.000032** [#1]	**0.000017** [#1]	0.000034	0.00028	**0.0090** [#1]	0.00038	**0.00010** [#1]	---
	05-Aug-2016	**0.56** [#1]	**0.0080** [#1]	0.032	0.31	1.3	2.5	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	05-Aug-2016	**0.6** [#1]	**0.0086** [#1]	0.039	0.34	1.6	1.6	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-2016	**0.50** [#1]	**0.0044** [#1]	0.025	0.26	1.1	1.2	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00012	**0.017** [#1]	0.000074	< 0.000020	---
(Duplicate)	03-Nov-2016	**0.56** [#1]	**0.0059** [#1]	0.023	0.29	1.3	1.3	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00012	**0.021** [#1]	0.000073	< 0.000020	---
	13-Aug-2017	**0.56** [#1]	**0.0077** [#1]	0.00091	0.22	2.8	2.5	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	13-Aug-2017	0.35	**0.0045** [#1]	0.0012	0.12	1.3	2.4	---	---	---	---	---	---	---	---	---	---	---
NWR 09-3-20	21-Aug-2013	0.0095	0.00079	< 0.00040	< 0.00080	< 0.1	0.27	---	---	---	---	---	---	---	---	---	---	---
	11-Oct-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.15	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00014	0.00035	0.000050	< 0.000020	---
	08-May-2014	0.0032	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000070	< 0.00010	0.00012	< 0.000020	---
	01-Aug-2014	0.0026	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.26	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000078	0.00019	0.000086	< 0.000020	---
	31-May-2015	0.0065	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.12	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000059	0.00028	0.000083	< 0.000020	---
	04-Jul-2015	0.0011	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.22	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	0.00077	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.18	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	0.0025	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.18	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000073	0.00019	0.00015	0.000024	---
	25-Nov-2015	0.0028	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000056	< 0.00010	0.000086	< 0.000020	---
	12-Mar-2016	0.0019	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.11	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000065	0.00015	0.00011	< 0.000020	---
	05-Aug-2016	---	---	---	---	---	---	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000058	< 0.00010	0.00012	< 0.000020	---
	15-Aug-2017	---	---	---	---	---	---	< 0.00010	< 0.000050	0.000012 [#1]	< 0.0000085	< 0.0000075	**0.000047** [#1]	0.000064	0.00038	0.00015	**0.000038** [#1]	< 0.00020

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300		PHC						PAH										
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 09-4-17	20-Aug-2012	0.0035	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	0.017	< 0.00040	< 0.00040	0.0012	< 0.1	0.27	---	---	---	---	---	---	---	---	---	---	---
	08-May-2014	0.0030	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	01-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.20	---	---	---	---	---	---	---	---	---	---	---
	01-Jun-2015	0.0013	< 0.00040	< 0.00040	0.0022	< 0.1	0.22	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000071	0.00057	0.000092	< 0.000020	---
	04-Jul-2015	0.0013	< 0.00040	< 0.00040	0.0017	< 0.1	0.23	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	0.0014	< 0.00040	< 0.00040	0.0018	< 0.1	0.26	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2015	0.0020	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.21	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	0.0041	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	12-Mar-2016	0.0028	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.20	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	03-Nov-2016	0.0041	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.15	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.000057	< 0.000020	---
NWR 09-4-5	01-Aug-2014	0.026	< 0.00040	0.00055	0.0039	0.74	15	< 0.00010	---	< 0.000010	< 0.000031 [#1]	< 0.0000075	0.000015	0.00017	0.00079	0.00024	< 0.00015 [#1]	---
	31-May-2015	0.0070	0.00043	< 0.00040	0.0023	0.19	3.1	0.00022	---	< 0.000010	**0.000031** [#1]	**0.000018** [#1]	0.000026	0.00027	0.00068	0.00014	**0.00011** [#1]	---
	09-Aug-2015	0.25	0.0012	0.00078	0.036	0.28	12	0.00021	---	**0.000086** [#1]	**0.000095** [#1]	< 0.0000075	**0.00025** [#1]	0.00071	**0.0015** [#1]	**0.00056** [#1]	**0.00057** [#1]	---
	25-Nov-2015	0.15	0.00065	0.0012	0.025	0.56	11	0.00013	---	< 0.000010	**0.000079** [#1]	< 0.0000075	< 0.000010	0.00052	**0.0017** [#1]	**0.00053** [#1]	**0.00047** [#1]	---
	05-Aug-2016	**0.48** [#1]	0.0015	0.0022	0.04	0.69	13	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00020	**0.0015** [#1]	0.00011	0.000024	---
	03-Nov-2016	0.060	0.00070	0.00055	0.0047	< 0.10	220	---	---	---	---	---	---	---	---	---	---	---
	15-Mar-2017	0.013	< 0.00040	0.0012	0.0038	0.47	---	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	0.012	< 0.00040	0.00051	0.0095	0.74	61	---	---	---	---	---	---	---	---	---	---	---
	16-Jun-2017	0.021	< 0.00040	< 0.00040	0.0032	0.51	3.4	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.33	0.00071	0.00095	0.034	0.55	3.5	---	---	---	---	---	---	---	---	---	---	---
	15-Aug-2017	**0.54** [#1]	0.0015	0.0029	0.063	0.70	1.2	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000061	0.00074	< 0.000050	0.000024	< 0.00020
	14-Sep-2017	**0.43** [#1]	0.0020 [#1]	0.0021	0.059	0.94	6.5	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.26	0.0017	0.0017	0.046	0.80	4.7	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.15	**0.015** [#1]	0.0017	0.056	1.0	3.4	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.14	**0.0040** [#1]	0.0031	0.080	3.0	5.4	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.059	**0.0099** [#1]	0.0021	0.038	1.6	8.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Jan-2018	0.054	**0.011** [#1]	0.0023	0.042	1.6	9.3	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.051	**0.039** [#1]	0.0015	0.029	8.5	6.2	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.036	**0.014** [#1]	0.00077	0.011	1.9	3.5	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Mar-2018	0.034	**0.012** [#1]	0.00084	0.0079	0.80	3.6	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.024	**0.0092** [#1]	0.00065	0.0095	0.48	6.6	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300		PHC						PAH										
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 09-5-19	20-Aug-2012	0.085	< 0.00040	< 0.00040	0.0093	0.21	< 0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2012	0.091	< 0.00040	< 0.00040	0.0095	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2013	0.012	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.19	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2013	0.012	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.19	---	---	---	---	---	---	---	---	---	---	---
	08-May-2014	0.021	< 0.00040	< 0.00040	0.00098	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000069	0.00047	0.000082	< 0.000020	---
	01-Aug-2014	0.012	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.15	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Aug-2014	0.013	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.12	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	0.038	< 0.00040	< 0.00040	0.0030	< 0.1	0.26	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00016	**0.0026** [#1]	0.00020	< 0.000020	---
	08-Aug-2015	0.021	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2015	0.021	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.15	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	0.0012	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00015	< 0.000050	< 0.000020	---
	12-Mar-2016	0.0038	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.19	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000012	0.000069	0.00028	0.00017	0.000025 [#1]	---
	05-Aug-2016	0.0056	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
NWR 93-10-6	27-Aug-2001	< 0.0050	< 0.0050 [#1]	< 0.0050	< 0.01	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2002	< 0.0050	< 0.0050 [#1]	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	0.0047	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	0.12	< 0.00040	0.00087	0.025	< 0.1	1.0	0.00016	---	< 0.000010	< 0.0000085	< 0.0000075	0.000011	0.00046	**0.01** [#1]	0.00018	**0.000032** [#1]	---
	15-Aug-2016	0.0076	< 0.00040	< 0.00040	0.0022	< 0.1	0.21	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00011	**0.0015** [#1]	< 0.000050	< 0.000020	---
NWR 93-12-7	07-Sep-1997	< 0.0005	0.0007	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	< 0.0050	< 0.0050 [#1]	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	< 0.0050	< 0.0050 [#1]	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR 93-9-7	17-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 98-13-21	17-Sep-2000	0.011	< 0.0005	0.0010	0.01	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	0.0033	< 0.0005	< 0.0005	.0047-0.005	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	0.0107	< 0.0005	< 0.0005	0.0048	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	26-Aug-2003	0.0087	< 0.0005	< 0.0005	.0042-0.004	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	0.0085	< 0.0005	< 0.0005	0.0030	0.4	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.0073	< 0.0005	< 0.0005	< 0.0015	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2007	0.0036	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.0074	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	0.013	< 0.0004	< 0.0004	< 0.0008	0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Aug-2009	0.013	< 0.0004	< 0.0004	< 0.0008	0.12	0.2	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	0.028	< 0.0004	< 0.0004	< 0.0008	0.13	0.2	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2010	0.028	< 0.0004	< 0.0004	< 0.0008	0.14	0.2	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2011	0.053	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Aug-2011	0.062	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2012	0.045	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.10	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2012	0.051	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
NWR 98-13-21	21-Aug-2013	0.052	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.25	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2013	0.051	< 0.00040	< 0.00040	< 0.00080	0.1	0.17	---	---	---	---	---	---	---	---	---	---	---
	09-May-2014	0.036	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.28	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00020	0.00058	**0.00069** [#1]	**0.000033** [#1]	---
	01-Aug-2014	0.033	< 0.00040	< 0.00040	< 0.00080	0.17	0.11	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000019	0.00023	0.00077	**0.00057** [#1]	**0.000048** [#1]	---
(Duplicate)	01-Aug-2014	0.031	< 0.00040	< 0.00040	< 0.00080	0.14	0.12	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00010	0.00032	0.00030	0.000022	---
	31-May-2015	0.049	< 0.00040	< 0.00040	< 0.00080	0.18	0.12	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000067	0.00097	0.000096	< 0.000020	---
	04-Jul-2015	0.026	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.17	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Jul-2015	0.026	< 0.00040	< 0.00040	< 0.00080	0.13	0.15	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.12	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00013	0.00045	**0.00044** [#1]	< 0.000020	---
	25-Nov-2015	0.044	< 0.00040	< 0.00040	< 0.00080	0.1	0.18	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000067	0.00019	0.00021	< 0.000020	---
	12-Mar-2016	0.058	0.00044	< 0.00040	< 0.00080	0.71	0.22	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000011	0.000092	0.00029	0.00022	0.000025 [#1]	---
(Duplicate)	12-Mar-2016	0.043	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.95	---	---	---	---	---	---	---	---	---	---	---
	05-Aug-2016	0.015	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.20	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000090	0.00020	0.00035	0.000025 [#1]	---
(Duplicate)	05-Aug-2016	0.015	0.00043	< 0.00040	< 0.00080	< 0.1	0.15	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000073	0.00015	0.00029	0.000021	---
	02-Nov-2016	0.0068	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.29	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00010	0.00015	0.00030	< 0.000020	---
	15-Aug-2017	0.024	< 0.00040	< 0.00040	< 0.00080	0.23	0.18	< 0.00010	< 0.000050	< 0.000010	< 0.0000085	< 0.0000075	0.000021	0.000057	0.00028	0.00021	< 0.000020	< 0.00020
NWR 98-20-3	09-Sep-1998	**3.7** [#1]	**2.8** [#1]	**0.16** [#1]	0.68	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	**3.2** [#1]	**2.8** [#1]	**0.15** [#1]	0.69	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
NWR 98-23-21	15-Sep-1999	0.33	< 0.0050 [#1]	< 0.0050	0.0060	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	0.2	**0.026** [#1]	0.033	0.317	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	0.29	**0.0194** [#1]	0.0245	0.423	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	0.27	0.0019	0.0098	0.063	< 0.1	40	---	---	---	---	---	---	---	---	---	---	---
	05-Jul-2015	**0.44** [#1]	0.00060	0.0030	0.053	0.18	2.6	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	05-Jul-2015	**0.44** [#1]	0.00062	0.0038	0.045	0.25	2.9	---	---	---	---	---	---	---	---	---	---	---
NWR 99-19-3	15-Sep-1999	**0.55** [#1]	< 0.0050 [#1]	< 0.0050	0.063	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**1.4** [#1]	< 0.01 [#1]	0.024	0.2	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	**1.4** [#1]	< 0.0050 [#1]	0.034	0.168	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	26-Aug-2001	**1.7** [#1]	< 0.01 [#1]	0.037	0.163	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR 99-21-3	15-Sep-1999	< 0.0050	< 0.0050 [#1]	< 0.0050	0.015	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	< 0.0005	< 0.0005	< 0.0005	0.017	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---	---
NWR 99-22-4	26-Aug-2001	**4** [#1]	**0.38** [#1]	**0.3** [#1]	2.09	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	**4.33** [#1]	**0.921** [#1]	**0.135** [#1]	1.69	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**3.5** [#1]	**0.203** [#1]	**0.132** [#1]	1.47	13.8	52.6	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.155	< 0.005 [#1]	0.007	0.0417	0.46	4.7	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2006	**0.479** [#1]	< 0.005 [#1]	< 0.005	0.031	0.335	3.0	---	---	---	---	---	---	---	---	---	---	---
NWR-OBS33	01-Oct-2001	0.18	< 0.0050 [#1]	< 0.0050	0.085	---	---	0.00031	0.00015	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00095	**0.0094** [#1]	**0.0010** [#1]	< 0.00002	---
	08-May-2014	0.051	< 0.00040	< 0.00040	0.0032	7.6	230	< 0.01 [#1]	---	< 0.0010 [#1]	< 0.0021 [#1]	**0.00094** [#1]	**0.0023** [#1]	**0.048** [#1]	**0.049** [#1]	**0.091** [#1]	**0.012** [#1]	---
	31-May-2015	0.13	< 0.00040	0.00054	0.021	0.59	480	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	0.063	< 0.00040	< 0.00040	0.0057	0.95	390	0.0044	---	**0.0040** [#1]	**0.00087** [#1]	**0.00019** [#1]	**0.00095** [#1]	**0.021** [#1]	**0.028** [#1]	**0.04** [#1]	**0.0067** [#1]	---
	02-Nov-2016	0.11	0.00045	0.00058	0.020	0.17	500	< 0.0050	---	**0.0018** [#1]	< 0.00043 [#1]	< 0.00038 [#1]	< 0.00050 [#1]	**0.012** [#1]	**0.026** [#1]	**0.026** [#1]	**0.0031** [#1]	---
NWR-OBS34	01-Oct-2001	0.016	0.0006	< 0.0005	0.0043	---	---	0.00002	< 0.00005	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003	< 0.00017	0.00007	< 0.00001	---
NWR-OBS37	01-Oct-2001	0.064	**0.016** [#1]	0.01	0.16	---	---	< 0.00027	0.00022	< 0.00001	< 0.00002 [#1]	< 0.00001	< 0.00001	0.00055	**0.0026** [#1]	**0.00083** [#1]	< 0.00003 [#1]	---
	24-Oct-2011	0.079	0.0005	0.0018	0.06	1.3	24	---	---	---	---	---	---	---	---	---	---	---
RB-OBS-42	25-Nov-2015	0.0042	< 0.00040	< 0.00040	0.0013	1.6	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-OBS-46	09-May-2014	**0.97** [#1]	0.00093	0.0043	0.089	1.7	46	< 0.0011	---	**< 0.00027** [#1]	**< 0.000093** [#1]	**< 0.000082** [#1]	**< 0.00011** [#1]	**0.0034** [#1]	**0.0068** [#1]	**0.0019** [#1]	**0.00044** [#1]	---
	31-May-2015	0.28	**0.0070** [#1]	0.0030	0.084	0.95	110	0.0014	---	**0.00063** [#1]	**0.00014** [#1]	**< 0.000075** [#1]	**0.00014** [#1]	**0.0072** [#1]	**0.025** [#1]	**0.0070** [#1]	**0.00095** [#1]	---
	25-Nov-2015	**1** [#1]	0.0014	0.0053	0.2	1.6	170	0.0038	---	**< 0.00010** [#1]	**0.00026** [#1]	**< 0.000075** [#1]	**0.00025** [#1]	**0.013** [#1]	**0.027** [#1]	**0.013** [#1]	**0.0016** [#1]	---
	15-Aug-2016	**0.82** [#1]	**0.0022** [#1]	0.0046	0.15	2.2	71	0.0011	---	< 0.000010	**0.000039** [#1]	< 0.0000075	**0.000055** [#1]	**0.0035** [#1]	**0.011** [#1]	**0.0028** [#1]	**0.00043** [#1]	---
	15-Mar-2017	**0.83** [#1]	0.0020 [#1]	0.0068	0.25	38	5200	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	**1.3** [#1]	0.0010	0.0047	0.19	13	1900	---	---	---	---	---	---	---	---	---	---	---
	10-May-2017	**0.78** [#1]	0.0011	0.0021	0.13	1.7	140	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-2017	0.20	0.0011	0.0019	0.051	3.1	40	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.28	0.00085	0.0018	0.072	1.5	35	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	**0.94** [#1]	0.00069	0.0032	0.12	6.2	50	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-2017	**0.53** [#1]	0.00079	0.0039	0.12	1.6	18	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	**0.79** [#1]	0.00071	0.0043	0.14	1.9	33	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**0.62** [#1]	0.00052	0.0037	0.12	11	46	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	**0.67** [#1]	0.00054	0.0022	0.083	6.5	220	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	**0.75** [#1]	< 0.00040	0.0028	0.075	4.1	110	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	**0.92** [#1]	0.00046	0.0044	0.11	7.6	57	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	**0.64** [#1]	0.00053	0.0035	0.079	2.1	93	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	**0.75** [#1]	0.00045	0.0026	0.095	9.3	400	---	---	---	---	---	---	---	---	---	---	---
RB-OBS-49	31-May-2015	0.022	**0.0030** [#1]	0.0074	0.19	3	5.7	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00022	**0.0038** [#1]	0.00027	**0.000025** [#1]	---
(Duplicate)	01-Jun-2015	0.023	**0.0032** [#1]	0.01	0.21	4.3	35	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	0.014	**0.012** [#1]	0.0091	0.081	0.5	2.2	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	**0.0011** [#1]	< 0.000050	< 0.000020	---
RB-OBS-48	21-Aug-2012	**0.91** [#1]	**0.37** [#1]	**0.093** [#1]	1.2	1.6	10	---	---	---	---	---	---	---	---	---	---	---
	08-May-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.11	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
(Duplicate)	08-May-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.14	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	15-Aug-2016	0.0024	< 0.00040	0.00047	< 0.00080	< 0.10	0.29	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00028	< 0.000050	< 0.000020	---
	03-Nov-2016	0.0025	< 0.00040	0.00044	0.0040	< 0.10	2.9	---	---	---	---	---	---	---	---	---	---	---
RB-OBS-45	21-Aug-2012	0.19	< 0.00040	0.00086	0.03	0.77	12	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	0.13	0.0014	0.00065	0.0068	0.33	2.9	0.00015	---	< 0.000010	< 0.0000085	0.0000077	< 0.000010	0.00029	**0.0016** [#1]	0.000075	< 0.000020	---
	25-Nov-2015	0.36	0.00063	0.0013	0.022	0.47	2.9	0.00013	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00039	**0.0015** [#1]	0.00018	0.000020	---
RB-OBS-44	31-May-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.21	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000018	< 0.000050	< 0.00010	< 0.000050	**0.00024** [#1]	---
RB-OBS-41	21-Aug-2012	**1.2** [#1]	< 0.00040	< 0.00040	0.022	< 0.1	0.46	---	---	---	---	---	---	---	---	---	---	---
	11-Oct-2013	0.19	0.00096	0.00094	0.0040	< 0.1	5.8	< 0.00010	---	< 0.000010	**< 0.000037** [#1]	< 0.0000075	**0.000055** [#1]	0.00024	0.00039	**0.00071** [#1]	**0.00020** [#1]	---
	19-Sep-2014	**0.38** [#1]	< 0.00040	< 0.00040	0.0011	0.14	1.3	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300		PHC						PAH										
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-OBS-40	21-Aug-2012	0.072	**0.0044 [#1]**	0.0057	0.034	0.53	13	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2012	0.072	**0.0045 [#1]**	0.0059	0.036	0.47	13	---	---	---	---	---	---	---	---	---	---	---
	11-Oct-2013	0.051	0.0014	0.0083	0.031	0.38	130	0.0016	---	< 0.000010	**< 0.000047 [#1]**	< 0.0000075	**0.00011 [#1]**	**0.013 [#1]**	**0.024 [#1]**	**0.013 [#1]**	**0.00047 [#1]**	---
	19-Sep-2014	0.033	0.00042	0.00091	0.0079	0.6	8.2	---	---	---	---	---	---	---	---	---	---	---
RB-OBS-47	09-May-2014	**0.82 [#1]**	**0.0098 [#1]**	0.023	0.11	0.39	2.4	0.00019	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00062	**0.0097 [#1]**	0.00038	**0.000038 [#1]**	---
	01-Jun-2015	0.0033	**0.043 [#1]**	< 0.00040	0.00095	0.28	16	0.00085	---	**0.00011 [#1]**	**0.000018 [#1]**	0.000012	**0.000042 [#1]**	**0.0032 [#1]**	**0.0077 [#1]**	**0.0023 [#1]**	**0.00016 [#1]**	---
	15-Aug-2016	0.011	0.00055	0.0012	0.0037	0.81	3.8	< 0.00010	---	**0.000021 [#1]**	< 0.0000085	< 0.0000075	< 0.000010	0.00029	0.00069	0.00030	**0.000042 [#1]**	---
(Duplicate)	15-Aug-2016	0.011	0.00058	0.0013	0.0039	0.69	6.2	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	0.21	**0.0035 [#1]**	0.0078	0.038	8.4	---	---	---	---	---	---	---	---	---	---	---	---
	10-May-2017	0.072	0.00041	0.00072	0.0066	0.62	2.6	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.014	0.00060	0.00093	0.0024	0.48	5.5	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Jul-2017	0.014	0.00069	0.00097	0.0029	0.59	4.9	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.013	0.00048	0.00075	0.0024	0.39	7.5	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-2017	0.018	0.00065	0.00061	0.0023	0.25	2.7	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.040	0.00057	0.0019	0.0053	0.92	6.6	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.11	0.00054	0.0027	0.0085	0.53	9.9	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.18	0.00043	0.0030	0.011	0.78	6.4	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.12	< 0.00040	0.0016	0.0071	0.63	5.8	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.23	< 0.00040	0.0032	0.014	0.95	---	---	---	---	---	---	---	---	---	---	---	---
RB-OBS-51	25-Nov-2015	0.0043	< 0.00040	< 0.00040	0.0015	0.35	---	---	---	---	---	---	---	---	---	---	---	---
RB-OBS-50	31-May-2015	0.0092	< 0.00040	< 0.00040	0.0075	0.27	0.55	< 0.00010	---	**0.000069 [#1]**	0.000016	< 0.0000075	**0.00010 [#1]**	0.00022	0.00086	**0.00050 [#1]**	**0.00038 [#1]**	---
	25-Nov-2015	0.0059	< 0.00040	< 0.00040	0.0029	< 0.1	1.5	---	---	---	---	---	---	---	---	---	---	---
RB-13-1-2.4	11-Oct-2013	**1.6 [#1]**	< 0.00040	0.0012	0.12	< 0.1	0.74	0.00014	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00074	**0.0091 [#1]**	**0.00046 [#1]**	< 0.000020	---
	13-Sep-2014	**0.45 [#1]**	< 0.00040	0.00040	0.025	< 0.1	0.43	< 0.00010	---	**0.000024 [#1]**	< 0.0000085	< 0.0000075	0.000030	0.00022	**0.0069 [#1]**	0.00019	**0.000049 [#1]**	---
	14-Sep-2017	**0.65 [#1]**	0.00042	< 0.00040	0.017	< 0.10	0.18	---	---	---	---	---	---	---	---	---	---	---
RB-13-2-2.4	11-Oct-2013	0.0050	< 0.00040	< 0.00040	0.0084	0.6	1.3	0.00015	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00058	**0.0038 [#1]**	0.00038	0.000020	---
	14-Sep-2014	0.00062	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.78	0.00021	---	**< 0.000076 [#1]**	< 0.000016	< 0.0000075	**0.000063 [#1]**	0.0011	**0.0021 [#1]**	**0.0011 [#1]**	**0.00020 [#1]**	---
	31-May-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.18	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00026	< 0.000050	< 0.000020	---
	18-Oct-2015	0.00092	< 0.00040	< 0.00040	< 0.00080	< 0.1	3.0	0.00040	---	< 0.000010	< 0.0000085	< 0.0000075	**0.000056 [#1]**	0.0018	**0.0012 [#1]**	**0.0015 [#1]**	**0.00021 [#1]**	---
	15-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.72	< 0.00010	---	**0.000018 [#1]**	< 0.0000085	< 0.0000075	< 0.000010	0.00037	0.00033	0.00020	**0.000049 [#1]**	---
	01-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.68	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00027	0.00015	0.00013	**0.000039 [#1]**	---
	14-Sep-2017	0.0082	< 0.00040	0.0032	0.0033	< 0.10	0.19	---	---	---	---	---	---	---	---	---	---	---
RB-13-3-2.4	11-Oct-2013	0.045	0.00050	0.018	0.082	< 0.1	0.67	0.00014	---	< 0.000010	< 0.000018	< 0.0000075	**0.000079 [#1]**	0.00049	**0.0053 [#1]**	**0.00099 [#1]**	**0.00012 [#1]**	---
	14-Sep-2014	0.1	0.0011	0.087	0.28	0.42	0.81	0.00014	---	**0.000013 [#1]**	< 0.0000085	< 0.0000075	0.000010	0.00040	**0.019 [#1]**	0.00031	< 0.000020	---
	15-Aug-2016	0.19	< 0.00040	< 0.00040	< 0.00080	0.72	0.17	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000060	**0.0029 [#1]**	< 0.000050	0.000021	---
	01-Oct-2016	0.013	< 0.00040	0.0079	0.0059	< 0.10	0.24	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000062	**0.0038 [#1]**	< 0.000050	< 0.000020	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-13-4-3	11-Oct-2013	0.098	0.0014	0.0023	0.08	0.27	0.97	0.00025	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00066	**0.0030** [#1]	**0.00089** [#1]	**0.000049** [#1]	---
	14-Sep-2014	0.034	< 0.00040	0.00054	0.015	< 0.1	0.42	0.00014	---	**0.000012** [#1]	< 0.0000085	< 0.0000075	< 0.000010	0.00043	**0.0017** [#1]	**0.00064** [#1]	**0.000039** [#1]	---
	18-Oct-2015	0.075	< 0.00040	0.0013	0.0056	0.11	1.7	0.00062	---	< 0.000010	< 0.0000085	< 0.0000075	**0.000042** [#1]	0.0020	**0.0030** [#1]	**0.0037** [#1]	**0.00016** [#1]	---
(Duplicate)	18-Oct-2015	0.074	< 0.00040	0.0013	0.0058	0.13	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2016	0.10	< 0.00040	0.0020	0.0017	< 0.10	0.36	0.00015	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00040	**0.0015** [#1]	0.00037	< 0.000020	---
	14-Sep-2017	0.047	< 0.00040	0.00059	< 0.00080	0.10	0.35	---	---	---	---	---	---	---	---	---	---	---
RB-13-5-2.4	11-Oct-2013	0.013	0.0010	0.00098	0.0032	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000076	0.00016	< 0.000050	< 0.000020	---
	14-Sep-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	18-Oct-2015	0.015	< 0.00040	< 0.00040	0.0017	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	15-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000013	< 0.000050	< 0.00010	< 0.000050	**0.000059** [#1]	---
	01-Oct-2016	0.0053	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
RB-13-6-2.4	11-Oct-2013	0.17	0.0013	0.0014	0.092	< 0.1	2.3	0.00015	---	< 0.000010	< 0.000016	< 0.0000075	0.000038	0.00093	**0.017** [#1]	**0.0013** [#1]	**0.00011** [#1]	---
	13-Sep-2014	0.22	< 0.00040	< 0.00040	0.011	< 0.1	0.37	0.00013	---	**0.000082** [#1]	**0.000064** [#1]	**0.000060** [#1]	**0.00012** [#1]	0.00056	**0.0053** [#1]	**0.00062** [#1]	**0.00025** [#1]	---
	19-Oct-2015	0.25	0.0012	< 0.00040	0.016	< 0.1	8.8	0.00079	---	**< 0.000050** [#1]	**0.00068** [#1]	**0.00082** [#1]	**0.00040** [#1]	**0.0032** [#1]	**0.045** [#1]	**0.0038** [#1]	**0.0011** [#1]	---
	15-Aug-2016	0.096	0.00041	< 0.00040	0.0071	< 0.1	0.46	0.00052	---	**0.00012** [#1]	**0.000028** [#1]	**0.000045** [#1]	**0.000088** [#1]	0.0011	**0.011** [#1]	**0.00093** [#1]	**0.00014** [#1]	---
	01-Oct-2016	0.18	< 0.00040	< 0.00040	0.015	< 0.10	0.22	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00016	**0.0023** [#1]	0.00010	< 0.000020	---
RB-13-7-1.5	11-Oct-2013	**0.87** [#1]	0.0017	< 0.00040	0.11	< 0.1	0.75	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000018	0.000088	**0.0067** [#1]	0.00015	**0.000036** [#1]	---
	13-Sep-2014	**0.77** [#1]	0.00044	< 0.00040	0.015	< 0.1	0.44	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000089	**0.0076** [#1]	< 0.000050	< 0.000020	---
RB-13-8-1.5	11-Oct-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	13-Sep-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---	---
	19-Oct-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00015	< 0.000050	< 0.000020	---
	15-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000024	< 0.000050	< 0.00010	< 0.000050	**0.00011** [#1]	---
	01-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	0.000010	< 0.000050	< 0.00010	< 0.000050	**0.000040** [#1]	---
RB-MW17-01	16-Jun-2017	**0.47** [#1]	0.0011	0.012	0.35	0.72	2.2	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	**0.73** [#1]	**0.0022** [#1]	0.0063	0.44	0.25	2.8	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	**0.54** [#1]	0.0011	0.0098	0.32	1.1	2.7	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	**0.41** [#1]	0.00089	0.0093	0.27	1.5	27	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	**0.39** [#1]	0.00089	0.0083	0.27	2.4	17	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**0.40** [#1]	0.0011	0.0066	0.26	0.75	25	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	**0.59** [#1]	0.00067	0.0089	0.25	2.9	21	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	**0.59** [#1]	0.00057	0.0068	0.19	2.9	36	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	**0.65** [#1]	0.00058	0.0018	0.20	5.0	49	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	**0.56** [#1]	0.00065	0.00062	0.15	3.1	37	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	**0.61** [#1]	0.0011	0.0011	0.15	3.4	80	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-MW17-02	16-Jun-2017	**0.84** [#1]	**0.0039** [#1]	0.040	0.53	0.88	2.5	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	**0.70** [#1]	**0.0031** [#1]	0.010	0.40	0.90	2.8	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	**1.2** [#1]	**0.0042** [#1]	0.037	0.67	2.0	59	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	**1.2** [#1]	**0.0042** [#1]	0.055	0.70	8.7	17	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	**0.66** [#1]	**0.0031** [#1]	0.021	0.54	3.0	8.9	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**0.63** [#1]	**0.0028** [#1]	0.022	0.48	1.5	3.5	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	**0.63** [#1]	**0.0037** [#1]	0.023	0.51	3.7	12	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	**0.61** [#1]	**0.0025** [#1]	0.018	0.47	1.2	5.0	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	**0.62** [#1]	**0.0024** [#1]	0.019	0.46	2.3	7.3	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	**0.53** [#1]	**0.0026** [#1]	0.015	0.48	3.2	4.3	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Mar-2018	**0.59** [#1]	**0.0025** [#1]	0.024	0.52	2.4	21	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	**0.49** [#1]	**0.0023** [#1]	0.015	0.56	16	40	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-03	16-Jun-2017	**1.9** [#1]	**0.22** [#1]	0.065	0.69	1.9	12	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2017	**3.6** [#1]	**0.68** [#1]	**0.11** [#1]	1.1	0.65	3.6	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	**4.0** [#1]	**1.0** [#1]	**0.16** [#1]	1.4	1.3	5.3	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	**3.7** [#1]	**0.61** [#1]	**0.13** [#1]	1.2	5.4	40	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	**3.4** [#1]	**0.91** [#1]	**0.14** [#1]	1.1	1.2	30	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**4.2** [#1]	**0.75** [#1]	**0.16** [#1]	1.4	< 0.10	57	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	**1.9** [#1]	**0.16** [#1]	**0.10** [#1]	1.0	2.4	12	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	**2.2** [#1]	**0.16** [#1]	**0.091** [#1]	0.96	1.5	12	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	**2.4** [#1]	**0.17** [#1]	0.057	0.79	2.5	28	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	**2.0** [#1]	**0.13** [#1]	0.030	0.40	0.77	24	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-04	15-Jun-2017	**1.9** [#1]	**2.2** [#1]	**0.24** [#1]	1.1	2.7	50	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	**1.4** [#1]	**1.6** [#1]	**0.25** [#1]	1.1	1.3	7.3	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Jul-2017	**1.4** [#1]	**1.6** [#1]	**0.25** [#1]	1.1	1.1	60	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.27	**0.32** [#1]	0.034	0.35	3.1	23	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	**4.3** [#1]	**2.5** [#1]	**0.16** [#1]	0.77	< 0.10	6.8	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	14-Sep-2017	**2.9** [#1]	**1.7** [#1]	**0.21** [#1]	0.92	2.2	15	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	**4.6** [#1]	**2.3** [#1]	**0.24** [#1]	1.1	4.2	27	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	14-Oct-2017	**4.9** [#1]	**2.4** [#1]	**0.23** [#1]	1.1	3.6	32	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**3.8** [#1]	**2.2** [#1]	**0.28** [#1]	1.2	< 0.10	130	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	**2.8** [#1]	**1.8** [#1]	**0.25** [#1]	1.1	3.7	74	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	**2.0** [#1]	**1.5** [#1]	**0.33** [#1]	1.6	21	78	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	**2.1** [#1]	**2.0** [#1]	**0.21** [#1]	1.0	5.8	110	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-MW17-05	15-Jun-2017	**2.4** [#1]	**1.3** [#1]	**0.13** [#1]	0.57	0.37	1.9	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.084	**0.037** [#1]	0.0056	0.022	0.30	0.37	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.0021	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.42	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.16	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-06	16-Jun-2017	**0.79** [#1]	**0.42** [#1]	**0.11** [#1]	0.45	0.90	0.99	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	**0.80** [#1]	**0.31** [#1]	**0.092** [#1]	0.35	0.35	1.2	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	**0.40** [#1]	**0.11** [#1]	**0.11** [#1]	0.39	0.87	2.5	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	0.16	**0.013** [#1]	**0.13** [#1]	0.47	1.6	2.2	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.28	**0.069** [#1]	**0.11** [#1]	0.41	3.5	6.2	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.22	**0.012** [#1]	**0.16** [#1]	0.52	1.1	11	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	**0.83** [#1]	**0.22** [#1]	**0.15** [#1]	0.46	1.7	2.5	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Dec-2017	**0.83** [#1]	**0.21** [#1]	**0.15** [#1]	0.45	1.7	1.9	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	**1.3** [#1]	**0.28** [#1]	**0.14** [#1]	0.48	1.3	3.7	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-07	16-Jun-2017	**0.41** [#1]	**0.16** [#1]	0.089	0.36	0.55	2.1	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.31	**0.061** [#1]	0.070	0.30	0.71	1.5	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.11	**0.012** [#1]	0.0066	0.095	0.27	0.86	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	0.012	**0.0030** [#1]	0.00043	0.0038	0.29	0.98	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	**0.93** [#1]	**0.40** [#1]	0.058	0.21	1.8	1.8	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**0.54** [#1]	**0.16** [#1]	0.050	0.22	0.82	15	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	**0.38** [#1]	**0.074** [#1]	0.054	0.25	1.4	2.5	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.30	**0.043** [#1]	0.044	0.21	0.95	3.4	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.19	**0.0044** [#1]	0.043	0.22	0.94	2.2	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.17	**0.0024** [#1]	0.043	0.22	0.93	2.9	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.18	**0.0022** [#1]	0.039	0.20	1.3	3.7	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-08	16-Jun-2017	0.042	< 0.00040	0.00055	0.022	0.40	4.1	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.045	0.00044	0.00043	0.021	0.47	1.8	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.054	0.00041	0.00058	0.013	6.2	15	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2017	0.066	< 0.00040	0.00057	0.017	1.6	13	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	0.048	< 0.00040	0.00060	0.019	0.72	6.7	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.068	0.0011	0.00068	0.021	0.69	11	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.10	< 0.00040	0.00057	0.023	0.71	21	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.12	< 0.00040	0.00058	0.022	0.88	1.9	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.081	< 0.00040	< 0.00040	0.0039	0.56	4.6	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.18	0.00058	0.00076	0.023	1.8	3.3	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.13	< 0.00040	< 0.00040	0.014	0.58	22	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH										
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-MW17-09	16-Jun-2017	0.23	0.00045	0.0017	0.093	0.49	1.9	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Jun-2017	0.22	0.00047	0.0016	0.085	0.57	1.8	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	0.20	0.00050	0.00052	0.078	0.79	1.8	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.22	< 0.00040	0.00095	0.036	0.78	4.5	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	0.22	< 0.00040	0.0011	0.026	0.59	2.0	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.16	0.00079	0.00065	0.019	1.5	7.8	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.25	0.00043	0.0019	0.071	0.75	2.3	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Nov-2017	0.26	0.00047	0.0018	0.068	0.67	6.3	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.29	< 0.00040	0.0021	0.085	0.93	2.5	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.28	0.00048	0.0016	0.071	0.72	6.4	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.33	< 0.00040	0.0021	0.091	0.94	5.1	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.29	< 0.00040	0.0015	0.073	1.8	3.4	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.36	< 0.00040	0.0021	0.090	0.57	4.9	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-10	19-Jun-2017	**0.69** [#1]	0.0015	0.013	0.14	0.40	7.1	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	**0.38** [#1]	< 0.00040	0.0052	0.060	0.90	9.5	---	---	---	---	---	---	---	---	---	---	---
RB-MW17-11	19-Jun-2017	**0.86** [#1]	**0.0038** [#1]	0.0040	0.42	10	90	---	---	---	---	---	---	---	---	---	---	---
RB-OBS28	01-Oct-2001	**2.89** [#1]	**0.18** [#1]	(0.06)	1.57	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Oct-2011	**0.52** [#1]	**0.037** [#1]	0.085	0.67	22	170	---	---	---	---	---	---	---	---	---	---	---
RB-OBS32	01-Oct-2001	**0.52** [#1]	**< 0.04** [#1]	< 0.04	0.69	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	0.0220	**< 0.0050** [#1]	0.0097	0.237	23.9	783	---	---	---	---	---	---	---	---	---	---	---
	24-Oct-2011	0.017	< 0.0004	0.0013	0.012	1.3	75	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	0.0034	< 0.00040	< 0.00040	< 0.00080	2.4	950	**0.12** [#1]	---	**< 0.0010** [#1]	**0.0065** [#1]	**0.01** [#1]	**0.012** [#1]	**0.19** [#1]	**0.1** [#1]	**0.37** [#1]	**0.027** [#1]	---
RB-OBS33	12-Mar-2016	0.12	0.00047	0.00083	0.025	3.3	80	0.00067	---	**0.00045** [#1]	**0.000089** [#1]	**0.000021** [#1]	**0.00010** [#1]	0.0015	**0.0085** [#1]	**0.0029** [#1]	**0.00052** [#1]	---
RB-OBS35	01-Oct-2001	0.17	**0.071** [#1]	< 0.0050	0.086	---	---	< 0.0017	0.0038	**< 0.00020** [#1]	**< 0.00028** [#1]	**< 0.00010** [#1]	**0.00016** [#1]	0.0028	**< 0.011** [#1]	**0.0076** [#1]	**0.00072** [#1]	---
	05-Feb-2003	**2.43** [#1]	**0.47** [#1]	**0.123** [#1]	1.19	19.1	16.8	< 0.0034	< 0.00051	**< 0.00066** [#1]	**< 0.00010** [#1]	**< 0.00010** [#1]	**< 0.00017** [#1]	**0.0051** [#1]	**0.052** [#1]	**0.0092** [#1]	**< 0.0012** [#1]	**< 0.010** [#1]
	24-Oct-2011	0.095	**0.014** [#1]	0.025	0.41	3.7	190	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	PHC: Toluene (mg/L)	PHC: Ethylbenzene (mg/L)	PHC: Xylenes (Total) (mg/L)	PHC: PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC: PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	PAH: Acridine (mg/L)	PAH: Anthracene (mg/L)	PAH: Benzo(a)Anthracene (mg/L)	PAH: Benzo(a)Pyrene (mg/L)	PAH: Fluoranthene (mg/L)	PAH: Fluorene (mg/L)	PAH: Naphthalene (mg/L)	PAH: Phenanthrene (mg/L)	PAH: Pyrene (mg/L)	PAH: Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-OBS36	01-Oct-2001	0.14	**0.052 [#1]**	0.01	0.13	---	---	< 0.00083	< 0.0016	< 0.00001	**< 0.00006 [#1]**	< 0.00001	**< 0.00005 [#1]**	0.0014	**0.0089 [#1]**	**0.0029 [#1]**	**< 0.00015 [#1]**	---
	24-Oct-2011	0.026	< 0.0004	< 0.0004	0.0029	0.87	31	---	---	---	---	---	---	---	---	---	---	---
RB-OBS38	01-Oct-2001	0.018	**0.0094 [#1]**	0.0059	0.15	---	---	< 0.0027	0.0017	**< 0.00010 [#1]**	**< 0.00010 [#1]**	**< 0.00010 [#1]**	**< 0.00010 [#1]**	**0.0049 [#1]**	**< 0.012 [#1]**	**0.0060 [#1]**	**< 0.00023 [#1]**	---
	05-Feb-2003	0.0041	0.0013	< 0.0005	0.0094	< 0.1	0.2	< 0.00011	< 0.00002	**< 0.00003 [#1]**	< 0.00001	< 0.00001	< 0.00001	< 0.00028	**0.0030 [#1]**	**0.00072 [#1]**	**0.00007 [#1]**	< 0.00045
	24-Oct-2011	0.03	< 0.0004	< 0.0004	< 0.0008	3	280	---	---	---	---	---	---	---	---	---	---	---
RB-OBS39	05-Feb-2003	0.0827	**0.0045 [#1]**	0.0024	0.0298	0.3	3.6	0.00047	< 0.00008	**< 0.00021 [#1]**	**< 0.00003 [#1]**	< 0.00001	**< 0.00006 [#1]**	0.0022	**0.0090 [#1]**	**0.0058 [#1]**	**0.00044 [#1]**	**< 0.0053 [#1]**
	24-Oct-2011	0.014	< 0.0004	< 0.0004	0.062	0.52	26	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	0.064	0.0011	0.0032	0.033	8	420	**0.027 [#1]**	---	**< 0.00010 [#1]**	**0.00064 [#1]**	**0.00060 [#1]**	**0.0034 [#1]**	**0.045 [#1]**	**0.14 [#1]**	**0.11 [#1]**	**0.0040 [#1]**	---
RB-RW-1	05-Mar-2003	0.0090	< 0.0005	< 0.0005	0.0018	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
RB-RW-10	24-Oct-2011	0.018	0.0004	< 0.0004	0.068	7.1	3.6	---	---	---	---	---	---	---	---	---	---	---
	11-Oct-2013	0.23	0.0018	0.0046	0.05	0.32	1.7	0.00039	---	< 0.000010	< 0.0000095	< 0.0000075	< 0.000010	0.00069	**0.014 [#1]**	**0.00090 [#1]**	**0.000065 [#1]**	---
	15-Aug-2016	0.28	0.00099	0.0038	0.085	0.49	2.3	0.00033	---	**0.000045 [#1]**	**0.000026 [#1]**	< 0.0000075	0.000033	0.00082	**0.014 [#1]**	**0.0012 [#1]**	**0.00015 [#1]**	---
RB-RW-11	24-Oct-2011	**0.46 [#1]**	**0.0095 [#1]**	0.036	0.41	11	190	---	---	---	---	---	---	---	---	---	---	---
RB-RW-12	01-Jun-2015	0.00059	0.00046	< 0.00040	< 0.00080	< 0.1	1.3	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	**0.000025 [#1]**	---
	15-Aug-2016	0.038	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.85	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00023	< 0.000050	< 0.000020	---
RB-RW-13	01-Jun-2015	0.017	< 0.00040	< 0.00040	0.0024	0.1	0.13	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00041	< 0.000050	< 0.000020	---
	15-Mar-2017	0.013	**0.12 [#1]**	0.0013	0.0035	0.50	9.0	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	0.013	**0.020 [#1]**	0.00073	0.0017	0.12	3.5	---	---	---	---	---	---	---	---	---	---	---
	10-May-2017	0.0084	**0.0026 [#1]**	0.0010	0.0018	0.12	1.6	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.67	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.25	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2017	0.00095	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.71	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.0030	< 0.00040	< 0.00040	< 0.00080	0.21	1.6	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-2017	0.0076	< 0.00040	< 0.00040	< 0.00080	0.24	0.74	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.026	0.00073	0.00065	0.0043	0.26	0.61	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	14-Oct-2017	0.022	0.00064	0.00058	0.0039	0.33	0.76	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.016	< 0.00040	< 0.00040	0.0024	0.25	0.97	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Nov-2017	0.017	< 0.00040	< 0.00040	0.0028	0.37	2.5	---	---	---	---	---	---	---	---	---	---	---
	21-Dec-2017	0.0091	**0.0024 [#1]**	0.0011	0.0020	0.21	1.2	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.0073	**0.0026 [#1]**	0.00092	0.0015	0.17	0.94	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.0019	0.00052	< 0.00040	< 0.00089	< 0.10	0.80	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	13-Feb-2018	0.0056	**0.0032 [#1]**	0.00099	0.0018	0.24	1.2	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.0084	**0.0068 [#1]**	0.0016	0.0030	0.12	0.95	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.0098	**0.0072 [#1]**	0.0016	0.0030	< 0.10	1.4	---	---	---	---	---	---	---	---	---	---	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300		PHC						PAH										
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-RW-14	24-Oct-2011	0.091	**0.0057** [#1]	0.024	0.47	9	310	---	---	---	---	---	---	---	---	---	---	---
RB-RW-2	05-Mar-2003	0.0021	< 0.0005	< 0.0005	0.0012	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---	---
RB-RW-3	25-Oct-2011	0.12	**0.0038** [#1]	0.0008	0.012	1.6	150	---	---	---	---	---	---	---	---	---	---	---
	01-Jun-2015	0.036	0.0010	0.0018	0.026	7.4	51	0.0023	---	< 0.000010	**0.00020** [#1]	**0.00021** [#1]	**0.00027** [#1]	**0.0039** [#1]	**0.018** [#1]	**0.01** [#1]	**0.00054** [#1]	---
RB-RW-4	25-Oct-2011	**0.51** [#1]	< 0.0004	0.0049	0.078	0.58	42	---	---	---	---	---	---	---	---	---	---	---
	31-May-2015	0.14	< 0.00040	< 0.00040	0.59	3.5	25	0.00057	---	**0.00057** [#1]	**0.00020** [#1]	**0.000066** [#1]	**0.00064** [#1]	0.0011	**0.0042** [#1]	**0.0017** [#1]	**0.0013** [#1]	---
	25-Nov-2015	0.22	0.00046	0.0029	0.023	0.67	12	0.00024	---	< 0.000011	**0.000072** [#1]	< 0.0000082	**0.000063** [#1]	0.0010	**0.0033** [#1]	**0.0020** [#1]	**0.00039** [#1]	---
	15-Aug-2016	0.081	< 0.00040	0.00067	0.19	2.8	82	**< 0.01** [#1]	---	**< 0.0010** [#1]	**< 0.00085** [#1]	**< 0.00075** [#1]	**< 0.0010** [#1]	**0.013** [#1]	**0.07** [#1]	**0.022** [#1]	**0.0023** [#1]	---
RB-RW-5	19-Sep-2014	0.0014	< 0.00040	0.00067	0.014	0.72	140	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	0.0012	0.00052	< 0.00040	< 0.00080	< 0.1	6.7	0.00013	---	< 0.000010	**0.000030** [#1]	< 0.0000075	0.000033	0.00061	**0.0012** [#1]	**0.0010** [#1]	**0.00015** [#1]	---
	02-Nov-2016	< 0.00040	**0.0072** [#1]	< 0.00040	< 0.00080	< 0.10	3.0	< 0.00010	---	< 0.000010	**0.000021** [#1]	< 0.0000075	< 0.000010	0.00024	0.00075	0.00036	**0.000085** [#1]	---
	15-Mar-2017	0.0011	**0.073** [#1]	< 0.00040	< 0.00080	< 0.10	27	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	0.0036	**0.016** [#1]	0.00061	0.0065	0.28	33	---	---	---	---	---	---	---	---	---	---	---
	10-May-2017	0.0020	**0.17** [#1]	0.00046	< 0.00080	0.35	33	---	---	---	---	---	---	---	---	---	---	---
	16-Jun-2017	< 0.00040	**0.011** [#1]	< 0.00040	< 0.00080	< 0.10	3.2	---	---	---	---	---	---	---	---	---	---	---
	15-Jul-2017	< 0.00040	**0.0025** [#1]	< 0.00040	< 0.00080	< 0.10	6.9	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	< 0.00040	**0.0045** [#1]	< 0.00040	< 0.00080	< 0.10	22	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-2017	< 0.00040	**0.010** [#1]	< 0.00040	< 0.00080	< 0.10	4.1	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.0018	**0.015** [#1]	< 0.00040	< 0.00080	< 0.10	5.6	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.0041	**0.0087** [#1]	< 0.00040	< 0.00080	< 0.10	15	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.0032	**0.0062** [#1]	< 0.00040	< 0.00089	0.14	2.4	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.0025	**0.0085** [#1]	< 0.00040	< 0.00089	0.20	4.6	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Jan-2018	0.0027	**0.013** [#1]	< 0.00040	< 0.00089	< 0.10	4.6	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.0021	**0.011** [#1]	< 0.00040	< 0.00089	0.19	7.5	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.0020	**0.0094** [#1]	< 0.00040	< 0.00089	0.16	15	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.0020	**0.0054** [#1]	< 0.00040	< 0.00089	< 0.10	1.2	---	---	---	---	---	---	---	---	---	---	---
RB-RW-6	25-Oct-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	84	---	---	---	---	---	---	---	---	---	---	---
	11-Oct-2013	0.0024	0.0010	0.0011	0.0033	< 0.1	0.21	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.000092	0.00024	0.000091	< 0.000020	---
	19-Sep-2014	0.0014	0.00054	< 0.00040	< 0.00080	< 0.1	4.9	---	---	---	---	---	---	---	---	---	---	---
	25-Nov-2015	< 0.00040	0.00052	< 0.00040	< 0.00080	0.1	18	0.00025	---	< 0.000010	**0.00011** [#1]	**0.000030** [#1]	< 0.000010	0.0014	0.00088	**0.0031** [#1]	**0.00049** [#1]	---
(Duplicate)	25-Nov-2015	0.00058	< 0.00040	< 0.00040	< 0.00080	0.12	17	---	---	---	---	---	---	---	---	---	---	---
	15-Aug-2016	0.00064	< 0.00040	< 0.00040	< 0.00080	< 0.1	1.4	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00015	0.00015	0.00028	**0.000058** [#1]	---

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300		PHC						PAH										
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**	**0.0034**
RB-RW-8	19-Sep-2014	0.0011	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.64	---	---	---	---	---	---	---	---	---	---	---
	01-Jun-2015	0.00081	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.00011	< 0.000050	< 0.000020	---
	15-Aug-2016	0.026	< 0.00040	0.00082	0.024	0.37	2.5	0.00021	---	**0.000032** [#1]	0.000011	< 0.0000075	0.000017	0.00074	**0.0018** [#1]	**0.0010** [#1]	**0.00014** [#1]	---
	15-Mar-2017	0.0027	< 0.00040	< 0.00040	< 0.00080	0.44	0.30	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Mar-2017	0.0024	< 0.00040	< 0.00040	< 0.00080	0.35	0.76	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	0.0025	0.00067	< 0.00040	< 0.00080	0.16	8.2	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	11-Apr-2017	0.0024	0.00056	< 0.00040	< 0.00080	0.11	4.9	---	---	---	---	---	---	---	---	---	---	---
	10-May-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.35	2.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	10-May-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.41	1.9	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2017	0.0050	< 0.00040	< 0.00040	< 0.00080	0.19	0.46	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.078	0.00047	0.00051	0.011	0.13	0.93	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2017	0.085	0.00051	0.00057	0.012	0.26	1.3	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	0.12	0.00051	0.00058	0.016	0.25	1.8	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.18	0.00051	0.00066	0.012	0.21	41	---	---	---	---	---	---	---	---	---	---	---
	22-Nov-2017	0.24	0.00061	0.0012	0.026	0.27	0.73	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.23	0.00078	0.0013	0.022	0.54	1.5	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.11	0.00065	0.00079	0.010	0.37	1.4	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.082	0.0018	0.00062	0.0082	0.31	2.1	---	---	---	---	---	---	---	---	---	---	---
RB-RW-9	19-Sep-2014	0.055	< 0.00050	< 0.00067	< 0.0028	1.8	12	---	---	---	---	---	---	---	---	---	---	---
	01-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.31	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020	---
	15-Aug-2016	0.18	0.0012	0.00076	0.0099	1.1	1.1	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	0.0010	< 0.000050	< 0.000020	---
(Duplicate)	15-Aug-2016	0.18	0.0013	0.00070	0.0098	0.44	6.4	---	---	---	---	---	---	---	---	---	---	---
	15-Mar-2017	0.017	**0.021** [#1]	< 0.00040	0.0040	0.84	16	---	---	---	---	---	---	---	---	---	---	---
	11-Apr-2017	0.010	**0.0049** [#1]	0.00043	0.0031	0.91	6.8	---	---	---	---	---	---	---	---	---	---	---
	10-May-2017	0.0035	< 0.00040	< 0.00040	< 0.00080	0.32	3.4	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	0.36	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2017	0.023	0.00073	< 0.00040	0.0012	0.43	3.1	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2017	0.064	0.00070	0.00052	0.0026	0.40	6.5	---	---	---	---	---	---	---	---	---	---	---
	14-Sep-2017	0.069	0.0014	< 0.00040	0.0022	0.50	8.5	---	---	---	---	---	---	---	---	---	---	---
	14-Oct-2017	0.073	0.0014	0.00055	0.0024	1.1	12	---	---	---	---	---	---	---	---	---	---	---
	23-Nov-2017	0.22	0.00097	0.00055	0.013	0.85	8.1	---	---	---	---	---	---	---	---	---	---	---
	20-Dec-2017	0.15	0.0019	0.00067	0.0070	1.1	7.1	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Dec-2017	0.15	**0.0021** [#1]	0.00061	0.0068	1.0	8.9	---	---	---	---	---	---	---	---	---	---	---
	17-Jan-2018	0.054	**0.0052** [#1]	0.00045	0.0029	0.62	9.8	---	---	---	---	---	---	---	---	---	---	---
	13-Feb-2018	0.049	**0.0035** [#1]	0.00049	0.0036	0.59	9.1	---	---	---	---	---	---	---	---	---	---	---
	21-Mar-2018	0.041	**0.0023** [#1]	0.00064	0.0042	0.75	5.0	---	---	---	---	---	---	---	---	---	---	---
	07-Apr-2018	0.047	**0.0037** [#1]	0.00051	0.0040	0.49	14	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 4
Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300		PHC						PAH										
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)	Quinoline (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		0.37	0.002	0.09	---	---	---	0.0058	0.0044	0.000012	0.000018	0.000015	0.00004	0.003	0.0011	0.0004	0.000025	0.0034

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Appendix 7 Conceptual Site Model: B-38X Area



Imperial

Conceptual Site Model

B-38X Area (APEC ME-6), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0006

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0006 - Conceptual Site Model: B-38X Area (APEC ME-6), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	D. Greves	M. Brown	S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 1

Figures

Figure 1 Site Location Map

Figure 2 Historical Air Photo 1961

Figure 3 Site Plan Showing Topography

Figure 4 Site Plan Showing Sampling Locations

Figure 5A Site Plan 3-D Visualization

Figure 5B Cross Section A-A' (South to Northwest)

Figure 6 Soil Analytical Results: Petroleum Hydrocarbon Parameters

Figure 7 Groundwater Analytical Results: Petroleum Hydrocarbon Parameters

Figure 8 Conceptual Site Model

Figure 9 Conceptual Exposure Model Flow Chart, Current Land Use and Site Conditions

Tables

Table 1 Soil Analytical Results: Inorganic Parameters

Table 2 Soil Analytical Results: Organic Parameters

Table 3 Water Analytical Results: Inorganic Parameters

Table 4 Water Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE	
Site Description:	West of Mainland Tank Farm (Figure 1). Three wellheads (B-38X, C-40X, and B-40X; see Figure 4). Facility process related buildings, including: LT7 satellite and LH4 line header. Active pipelines above and below ground. 8-bay garage, pipe storage, storage of crates with drilling products/materials.
Current Land Use:	CCME Industrial land use
Future Land Use:	CCME Industrial land use
HISTORICAL LAND USE	
1 Infrastructure Type:	Historical Tank Farms, Related Pipelines above and below ground (Figure 2).
Notes:	Crude Oil and/or Fuel Storage
Years Active:	From air photos, tanks present from pre-1950 to 1979.
2 Infrastructure Type:	B-38X Production / Naphtha Injection Well.
Notes:	Crude Oil Production and Naphtha Injection (Former Refinery by-product); anecdotal evidence of Naphtha spills and Injection Well casing leakage.
Years Active:	B-38X well spudded in 1942; well is currently active as a production well.
3 Infrastructure Type:	C-40X Production Well.
Notes:	Natural Gas Production Well.
Years Active:	C-40X well spudded in 1983; well is currently active as a production well.
4 Infrastructure Type:	B-40X Production Well.
Notes:	Crude Oil Production Well.
Years Active:	B-40X well spudded in 1982; well is currently active as a production well.
5 Infrastructure Type:	Former Fire Training Area (FTA).
Notes:	Bermed area used for fire suppression training and material storage.
Years Active:	Likely between the 1980's and late 1990's, based on air photos.

SITE SETTING	
Topography and Drainage:	Site slopes gently southward. Local drainage is toward the wetland area near southern boundary of Site, with regional drainage towards the Mackenzie River. See Figures 3, 4, and 5A/B.
Nearby Surface Water Bodies (Distance and Direction):	Mackenzie River (300 m to the south). Wetland (25 m to the south).
SOIL AND GROUNDWATER CONDITIONS	
Surficial Materials:	Silt, sandy silt (Figure 5B)
Presence of Permafrost:	~ 2 to 6 mbgs, top of permafrost quite variable across the Site but always present.
Depth to Bedrock:	~ 5 to 6 mbgs
Bedrock Lithology:	Weathered siltstone
Number of Groundwater-Bearing Zones (GBZs):	1
Number of Piezometers:	56 current piezometers (Figure 4), 12 historical now destroyed/decommissioned piezometers, 30 active remediation trenches for Dual Phase Extraction (DPE).
Free Product in Surficial GBZ:	Yes
Free Product in Shallow Bedrock GBZ:	NA
First Groundwater-Bearing Zone	
Primary Soil Type/Lithology:	Unconsolidated silt and sandy silt
Dominant Grain Size:	Fine
Depth to Groundwater Surface:	~ 0.1 to 5.3 mbgs
Hydraulic Conductivity (Minimum):	9.4×10^{-9} m /s
Hydraulic Conductivity (Maximum):	1.6×10^{-6} m/s
Hydraulic Conductivity (Geo Mean):	7.7×10^{-7} m/s
Vertical Hydraulic Gradient:	Downward
Lateral Hydraulic Gradient (I):	Estimated lateral hydraulic gradient ranges from 0.0028 (from FTA-N-E4 to the wetland area) to 0.045 (from B38X-N-E7 to B38X-S-E7). Mean value 0.024 used below.
Groundwater Flow Direction and Velocity:	South-southeast (following topography towards Mackenzie River and wetland). Velocity of a non-reactive tracer estimated at 2.9 m/year (based on v = KI/n) and dissolved PHC velocity of 1.3 m/year or less. This estimate is based on mean lateral gradient above, when remedial pumping wells are not active.

HISTORICAL ENVIRONMENTAL ACTIVITIES

Soil and groundwater characterization (1997 to present).

Groundwater and soil remediation DPE system, consisting of 30 trenches removing light end hydrocarbons by vapour extraction and groundwater pumping (2001 pilot system; 2004 full-scale).

CURRENT STATUS

Remaining soil and groundwater impacts (Figures 6 and 7, Tables 1 through 4).

Sources and Impacts

SOURCES	
Historical Sources:	Historical Tank Farm (APEC # ME-6; Appendix 4). B-38X Production / Naphtha Injection Well. Fire Training Area. Impacted soil (secondary source).
Current Sources:	Current adjacent Tank Farm (potential source) and impacted soil (secondary source).
KNOWN ENVIRONMENTAL CONCERNS	
a. Soil	
Potential Contaminants of Concern:	Petroleum hydrocarbons (PHCs), salinity, metals, PAHs.
Proven Contaminants of Concern:	PHCs - benzene, PHC F1 to F4 in part due to natural seepage. Limited salinity - electrical conductivity (primarily driven by chloride) in Fire Training Area. Metals in part due to natural seepage, shallow bedrock, and shale fill imported to Site. Polycyclic Aromatic Hydrocarbons (PAHs) in part due to natural seepage and shallow bedrock.
Lateral Delineation:	PHC issues complicated due to the presence of natural crude oil and saline water seeps (Figure 6).
Vertical Delineation:	Vertical delineation of PHC is interpreted based on the presence of permafrost as a hydraulic barrier under the entire area.
b. Groundwater	
Potential Contaminants of Concern:	PHCs, salinity, metals, phenols, PAHs.
Proven Contaminants of Concern:	PHCs Limited salinity – chloride (particularly FTA area). Metals & Phenols.

	As noted with soils, some of the PHC, salinity, metals and phenols issues in groundwater and surface water are attributed in part to natural seepage.
Presence of Free Product:	Yes
Lateral Delineation:	Lateral delineation complete to the north, west (additional monitoring west of B38 98-6-5 not shown on Figures) and south (Figure 7). Delineation not complete to the east due to the existing Mainland Tank Farm.
Vertical Delineation:	Vertical delineation of PHC is interpreted based on the presence of permafrost.

Migration Pathways and Receptors

MIGRATION PATHWAYS

Summarized in Figures 8 and 9.

Potential pathways include leaching from soil to groundwater, lateral migration in groundwater, discharge to surface water, shallow vapour migration in soil, water and wind erosion.

RECEPTORS

Summarized in Figures 8 and 9.

Main downgradient receptor of interest is the wetland/pond located south of the Site, in relation to human, wildlife and freshwater aquatic life receptors. Plants and soil invertebrates may also be receptors in the rooting zone of shallow soils.

EXPOSURE PATHWAYS

Summarized on Figures 8 and 9

Synopsis of Conceptual Risk

In terms of soil related exposure pathways, the DPE remediation trenches (installed in 2004 but currently not operational due to the temporary production shutdown) have reduced free product thickness observed in the soils significantly. Due to physical limitations including limited permeability in the native silts, active pipelines and oilfield facilities, and several roads through the area, some residual soil impacts exceeding PHC guidelines remain in place and are not currently accessible for excavation. Risks related to potential exposure pathways for human, ecological, microbial and wildlife contact or ingestion have been reduced by the remedial DPE system, but not eliminated. The DPE remediation systems will resume operation when the Norman Wells facility restarts production.

The pathway for leaching from soil to groundwater is active. However, measured light-end PHC values, particularly benzene, toluene and ethylbenzene (BTE) in groundwater at the downgradient southern perimeter of the Site generally do not exceed applied CCME freshwater aquatic life guidelines.

In terms of groundwater related exposure pathways, Figure 7 indicates that PHCs exceeding one or more of the applied guidelines for BTE persist under the footprint of the DPE remediation area. As such the exposure scenarios related to wildlife watering at the southern wetland, and freshwater

aquatic life further south at the Mackenzie River, are potentially complete but inactive, since the PHC plume is delineated before reaching these receptors. In terms of groundwater consumption, the exposure scenario is incomplete for both humans and wildlife. Human drinking water is sourced locally from the Mackenzie River upstream of this site, and is treated by the Town of Norman Wells before use.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

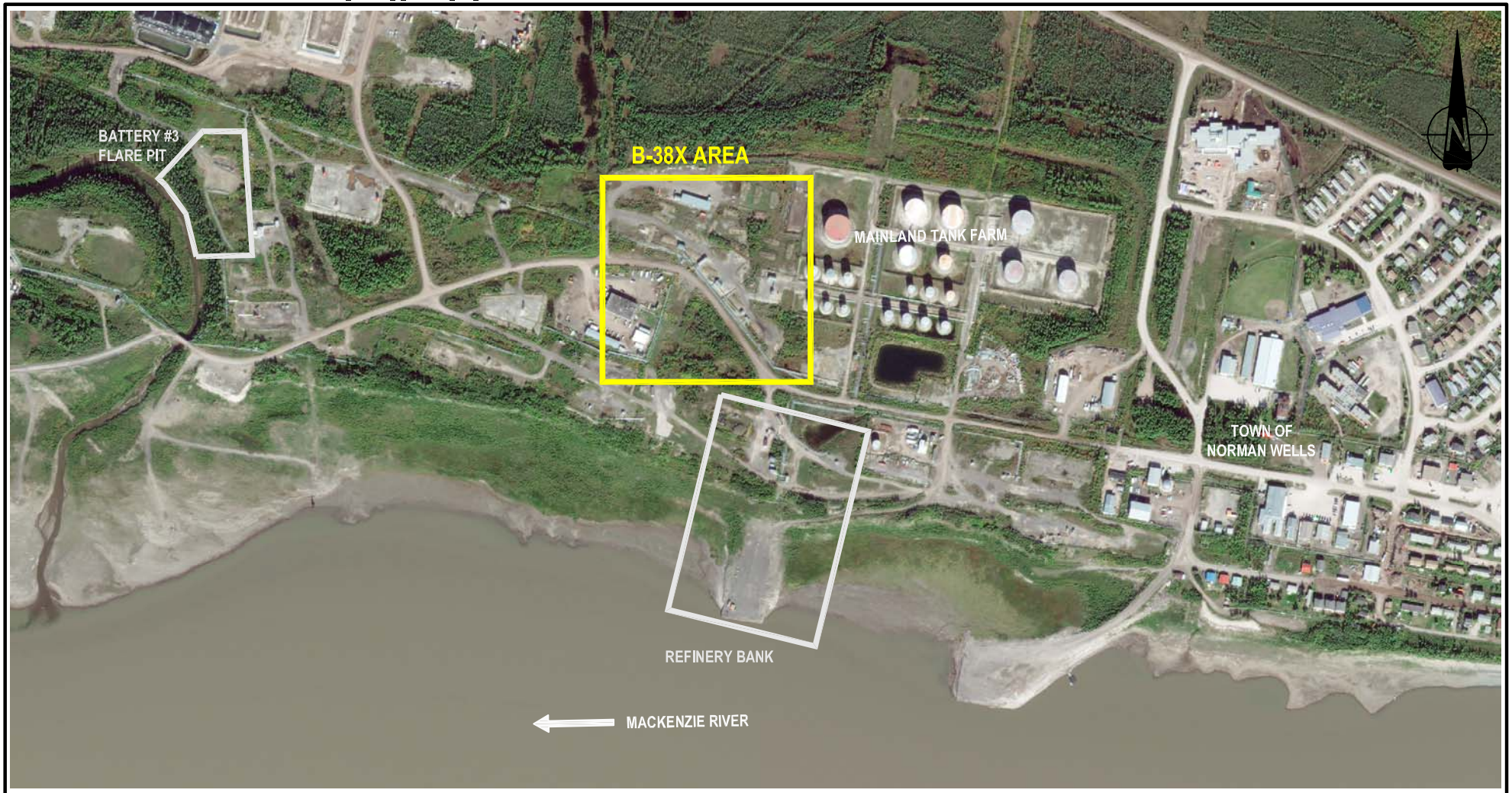
If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 400 m

1:8000

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	30-APR-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

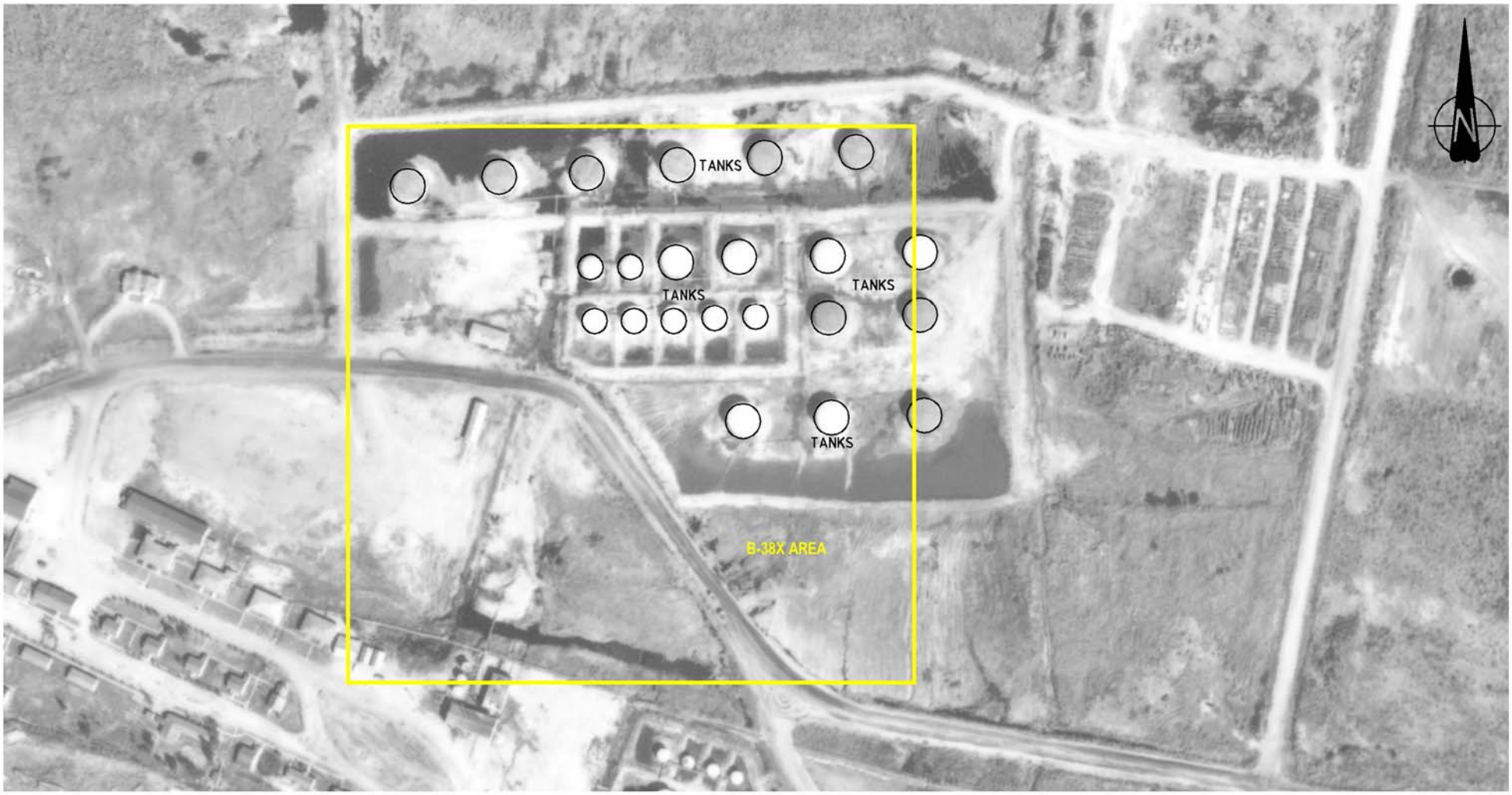
FIG No 1

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 9:59:35 AM USER NAME: blair.fink
SAVE DATE & TIME: 17/5/2018 3:04:40 PM ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-AIRPHOTO1961.DWG



m 0 50 100 150 m

1:3000

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1961

Date:	14-MAY-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No
2

REV
A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 9:43:19 AM USER NAME: blair.fink
SAVE DATE & TIME: 15/5/2018 11:26:42 AM ISSUING OFFICE: eCAD



Site Boundary

Dual Phase Extraction Trench

Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 25 50
Metres
1:2,000

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	30-MAY-18	Drawn by:	T.G.	Edited by:	T.G.	App'd by:	D.G.

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 3

REV 0

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:30:38 PM
USER NAME: Tom.Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\B38X\B38X_Topography_Rev0.mxd

B38 93-2-4
B38 02-36-3
B38 93-1-2
B38 99-4-30
B38X00-1
FTA 00-9-5
B-38X AREA
FTA-S07-1
FTA-S07-3
FTA-S07-4
FTA-TP07-4
FTA-S07-2
FTA-N-E5-OBS
FTA-S07-7
FTA-TP07-2
FTA-S07-5
FTA-N-E4
FTA-TP07-1
FTA-N-E4-OBS
FTA-12-3
FTA-N-E5
FTA-OBS-57
FTA-12-2
FTA-OBS-58
FTA-N-E6
FTA 99-3-4
FTA-TP07-3
FIRE TRAINING AREA
FTA-N-E6-OBS
FTA 00-8-5
B38X00-3
8-BAY GARAGE
B38X-N-E7
B38 98-8-4
B38 08-4-4
B38X-N-E7-OBS
FTA-S07-6
B38 98-7-3
FTA-OBS-56
FTA 99-2-4
B38 08-3-4
FTA-12-1
FTA-E5
FTA 98-4-5
FTA-E5-OBS
B38-12-4
B38X-N-E8
FTA 00-7-5
B38X00-2
B38 98-6-5
B38X-N-E6
B38-N-OBS62
B38X-N-E8-OBS
B38X-N-E6-OBS
B38X-N-OBS27
FTA-E2-OBS
FTA-E2
B38-N-OBS-60
B38X-N-E5-OBS
FTA-OBS14
FTA-OBS15
B38 00-32-44
B-38X
B38X-N-E5
FTA-E1-OBS
B38X-N-OBS26
B38-12-1
B38X-N-E3-OBS
B38-N-OBS-59
FTA-E1
B38-N-OBS-61
B38X-N-OBS25
FTA-OBS16
FTA 99-6-12
B38X-N-E2
FTA 99-5-6
B38X-N-E3
B38X-N-OBS24
FTA-N-E3-OBS
B38X00-4
B38-12-3
FTA-N-E3
B38X-N-E4-OBS
B38X-N-E4
FTA-OBS17
FTA-E4-OBS
DPE SYSTEM
FTA-E4
FTA01-01
B38X-N-E1-OBS
B38X-N-E1
FTA-N-E2
FTA-N-E1
FTA-N-E1-OBS
B38X-S-E3-OBS
B38X-S-E3
B38X-S-E2
B38 97-9-5
FTA-N-E2-OBS
B38 97-10-8
C-40X
FTA01-02
FTA01-03
B38X-S-E2-OBS
DPE SYSTEM
FTA-E3-OBS
FTA-E3
B38 08-2-4
B38 02-24-7
LT7-E2
LT7-E2-OBS
B38X-S-E5-OBS
LT7-E5-OBS
B38X-S-E5
LT7 BUILDING
LT7-E5
B38X-S-E6
B38 93-13-6
LT7-12-1
B38X-S-E6-OBS
B38 93-20-7
LT7-OBS-53
B38X-S-E7
B38 98-22-3
B38X-S-E7-OBS
B38 98-21-18
LT7-12-2
B38X-OBS9
LT7-E1
LT7-OBS-54
B38X-S-E1-OBS
B38X-S-E1
LT7-E1-OBS
LT7-OBS-55
LT7-E3-OBS
B38 PILOT TEST AREA
LT7-12-3
LT7-E3
B38 03-40-5
B38X03-04
B38X-OBS12
B38 98-19-5
LH4 BUILDING
B38X03-05
B38 99-14-4
B38 03-37-5
LT7-E4
B40 08-01
LT7-E4-OBS
B38X03-08
B38X03-07
B-40X
B40-10-1
B38 99-15-4
B38 99-16-17
B38 00-28-6
B38 02-17-3
B38X03-06
B38 03-38-5
B38 DP99-1
B40 08-02
B38MP00-3
B40-10-3
B40-10-2
WETLAND
B38X03-09
B38MP00-2
B38MP00-4

LEGEND

- PRODUCTION WELL LOCATION
- DUAL PHASE EXTRACTION TRENCHES
- 8" DPE TRENCH EXTRACTION WELLHEAD
- 4" DPE TRENCH OBSERVATION WELLHEAD
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- TEST PIT LOCATION

NOTE:
1. B38 PILOT TEST AREA INCLUDES ADDITIONAL WELLS FOR RADIUS OF INFLUENCE TESTING. THIS FIGURE ONLY SHOWS LOCATIONS CURRENTLY MONITORED DUE TO CONGESTION.
2. HISTORICAL SAMPLING LOCATIONS (PRE-2001) NOT SHOWN.

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 25 50 75 m

1:1250

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

SITE PLAN SHOWING SAMPLING LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

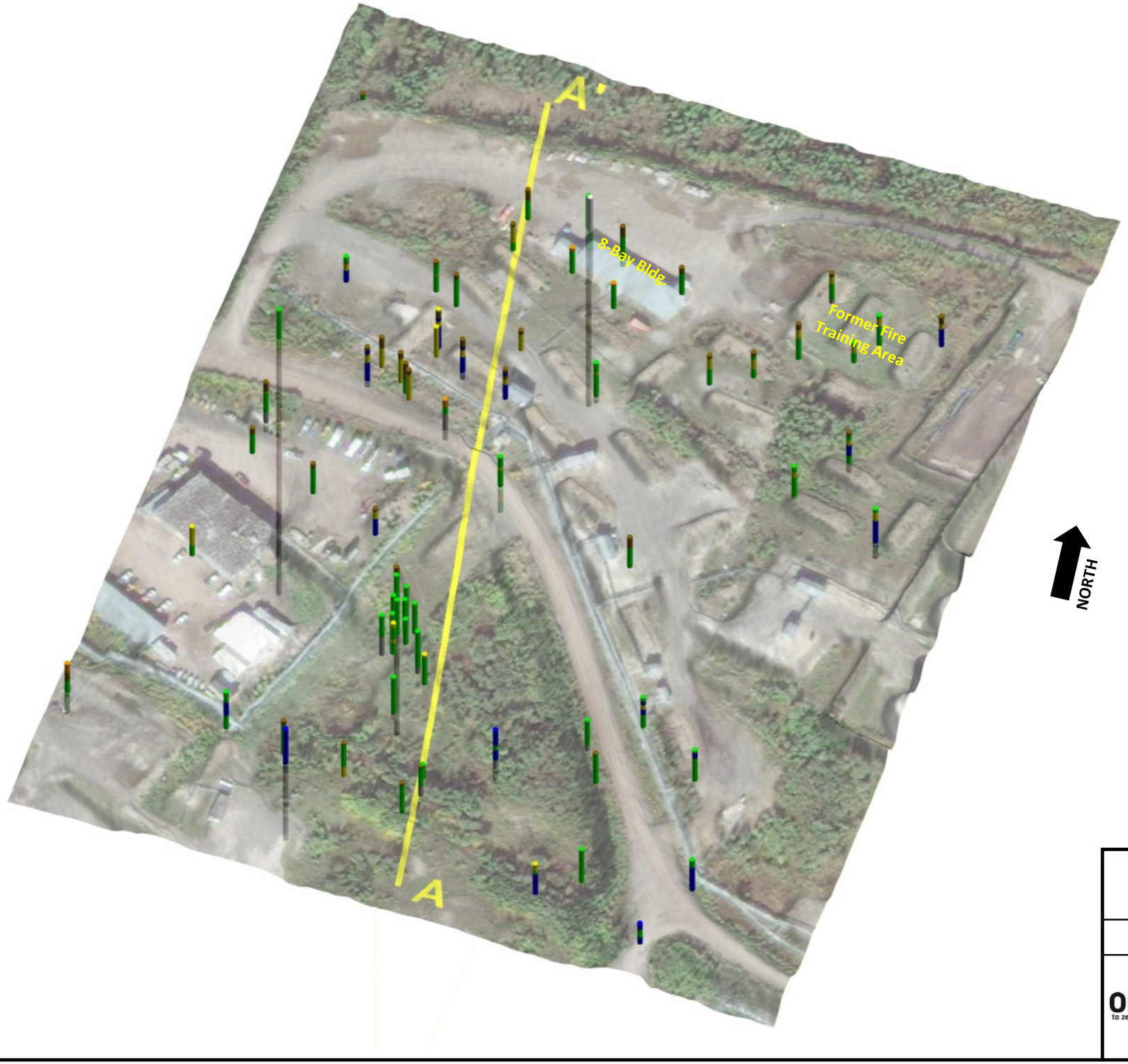
WorleyParsons Project No.
407011-00622-400

FIG No 4 | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG

PLOT DATE & TIME: 18/5/2018 10:37:21 AM USER NAME: blair.fink
SAVE DATE & TIME: 18/5/2018 10:24:40 AM ISSUING OFFICE: CALGARY



NORTH

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	DG	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622-400

FIG No.: 5A

REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\REFINERY BANK



A

A'

15 m

B38MP00-3

B38 99-15-4

B3 98-19-5

B38X-OBS9

B38 97-10-8

B38-N-OBS-59

B38 08-4-4

B38X93-2-4

Water Table

Wetland

Bedrock Surface

0 25 50 75

Unit

- CLAY
- COBBLES AND/OR GRAVEL
- NO SAMPLE
- SAND
- SANDSTONE
- SILT
- SILTSTONE/MUDSTONE/SHALE
- TOPSOIL/FILL/ORGANICS

- LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD PETROLEUM PARAMETERS UNDER GUIDELINES, SHOWN IN GREEN
- LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD PETROLEUM PARAMETERS EXCEEDING GUIDELINES, SHOWN IN RED
- LOCATION WHERE MOST RECENT GROUNDWATER SAMPLE HAD FREE-PHASE HYDROCARBONS, SHOWN IN PURPLE

Notes: 1) 5x vertical exaggeration
2) Cross-section width is 20 m.

IMPERIAL
CONCEPTUAL SITE MODEL
B38-X AREA, NORMAN WELLS, NT

CROSS-SECTION A-A' (SOUTH TO NORTHWEST)

OneWay to zero harm

Advisian
WorleyParsons Group

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	DG	MB

WorleyParsons Project No.: 407011-00622-400

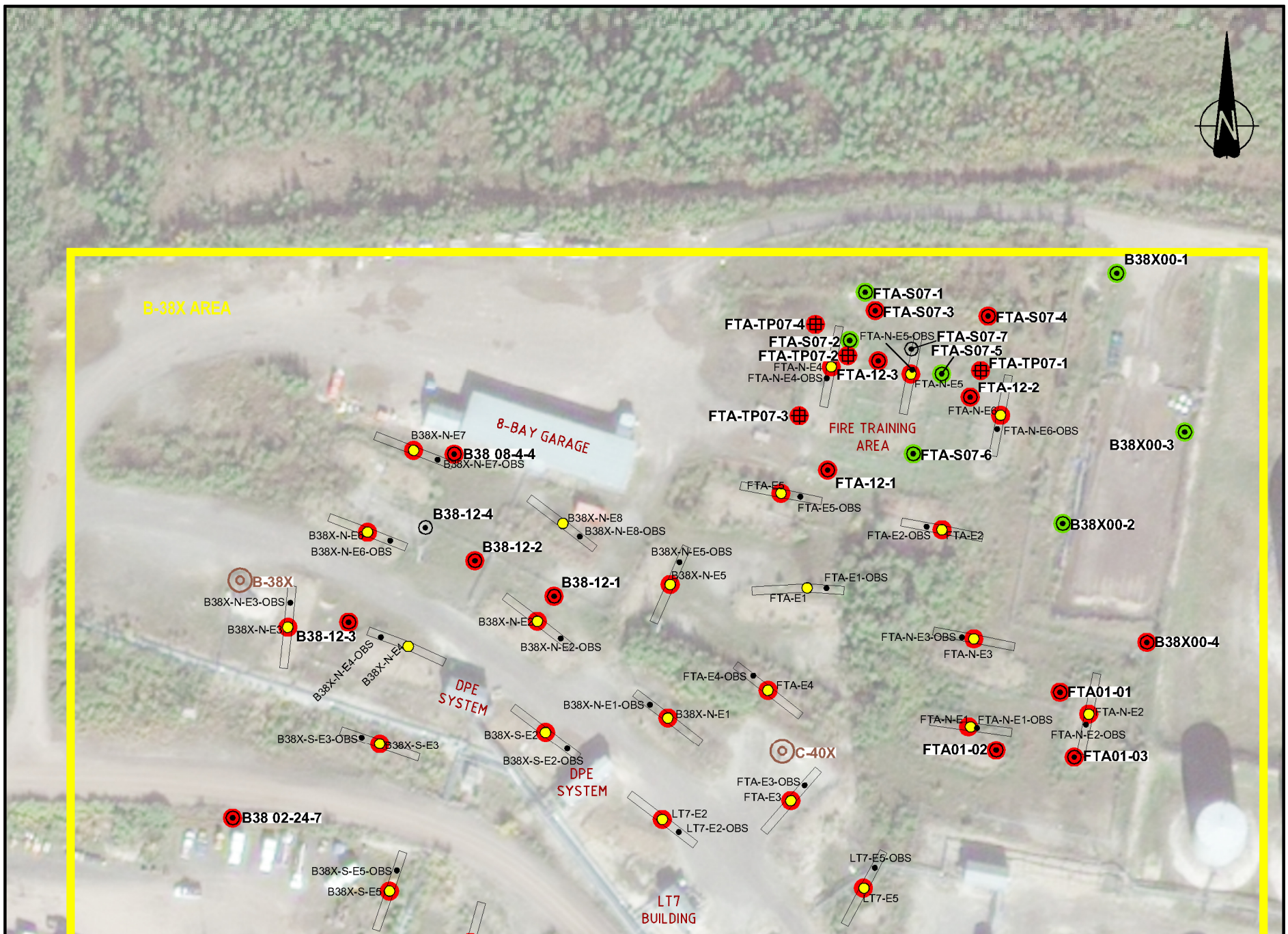
FIG No.: 5B

REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220\400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\B38X



LEGEND

- PRODUCTION WELL LOCATION
- DUAL PHASE EXTRACTION TRENCHES
- 8" DPE TRENCH EXTRACTION WELLHEAD
- 4" DPE TRENCH OBSERVATION WELLHEAD
- SOIL SAMPLING LOCATION
- TEST PIT LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED
- LOCATION WHERE REMEDIAL TRENCH SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

NOTES:
1. B38 PILOT TEST AREA INCLUDES ADDITIONAL WELLS FOR RADIUS OF INFLUENCE TESTING. THIS FIGURE ONLY SHOWS LOCATIONS CURRENTLY MONITORED DUE TO CONGESTION.
2. SOIL SAMPLING LOCATIONS PRIOR TO 2000 HAVE NOT BEEN SHOWN AS THE DATA IS NO LONGER CONSIDERED RELEVANT DUE TO 1) CHANGES IN SOIL ANALYTICAL METHODS, AND 2) THE EXTENSIVE IN SITU REMEDIAL PROGRAMS THAT HAVE OCCURRED SINCE THE EARLY 2000s.

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 25 50 75 m

1:1250

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS:
PETROLEUM HYDROCARBON PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
29-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

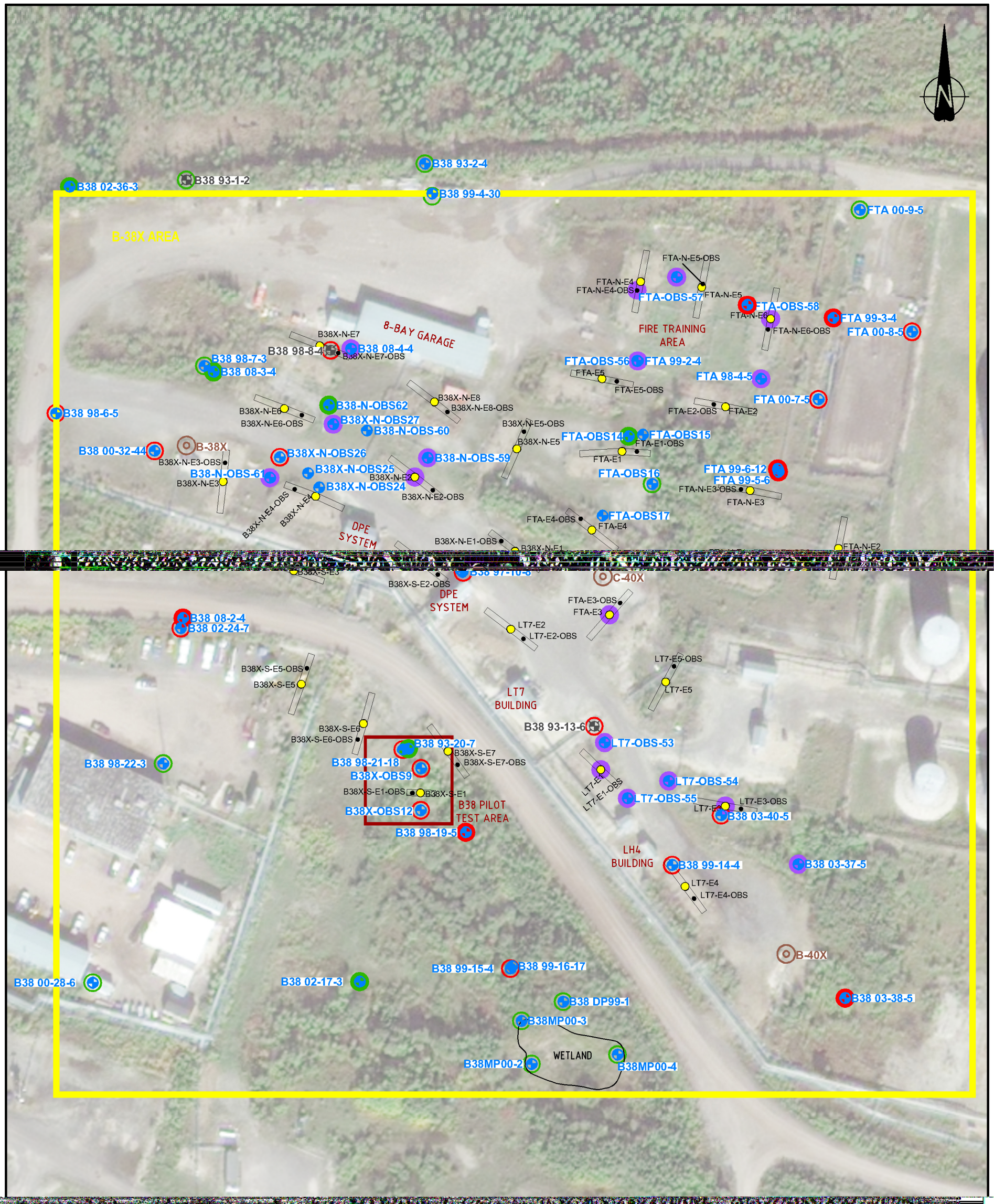
WorleyParsons Project No.
407011-00622-400

FIG No 6 | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 29/5/2018 8:50:28 AM USER NAME: blair.fink
SAVE DATE & TIME: 18/5/2018 10:40:12 AM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG



LEGEND

- PRODUCTION WELL LOCATION
- DUAL PHASE EXTRACTION TRENCHES
- 8" DPE TRENCH EXTRACTION WELLHEAD
- 4" DPE TRENCH OBSERVATION WELLHEAD
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION

NOTE:
B38 PILOT TEST AREA INCLUDES ADDITIONAL WELLS FOR RADIUS OF INFLUENCE TESTING. THIS FIGURE ONLY SHOWS LOCATIONS CURRENTLY MONITORED DUE TO CONGESTION.

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 01016610 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2014.

0 25 50 75 m

1:1250

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PETROLEUM HYDROCARBON (PHC) PARAMETERS (BENZENE, TOLUENE, AND ETHYLBENZENE) THAT WERE ANALYZED BETWEEN 2012-2017, SHOWN IN SOLID GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PETROLEUM HYDROCARBON (PHC) PARAMETERS (BENZENE, TOLUENE, AND ETHYLBENZENE) BUT MOST RECENT ANALYSIS WAS PRE-2012, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PETROLEUM HYDROCARBON (PHC) PARAMETERS (BENZENE, TOLUENE, AND ETHYLBENZENE) THAT WERE ANALYZED BETWEEN 2012-2017, SHOWN IN SOLID RED.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PETROLEUM HYDROCARBON (PHC) PARAMETERS (BENZENE, TOLUENE, AND ETHYLBENZENE) BUT MOST RECENT ANALYSIS WAS PRE-2012, SHOWN IN RED.
- LOCATION WHERE MEASURABLE FREE PHASE WAS OBSERVED IN ONE OR MORE SAMPLING EVENTS BETWEEN 2015-2017, SHOWN IN PURPLE
- PETROLEUM HYDROCARBON DATA NOT AVAILABLE

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

GROUNDWATER ANALYTICAL RESULTS: PETROLEUM HYDROCARBON PARAMETERS

Date:	29-MAY-18	Drawn by:	OTHERS	Edited by:	BMF	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

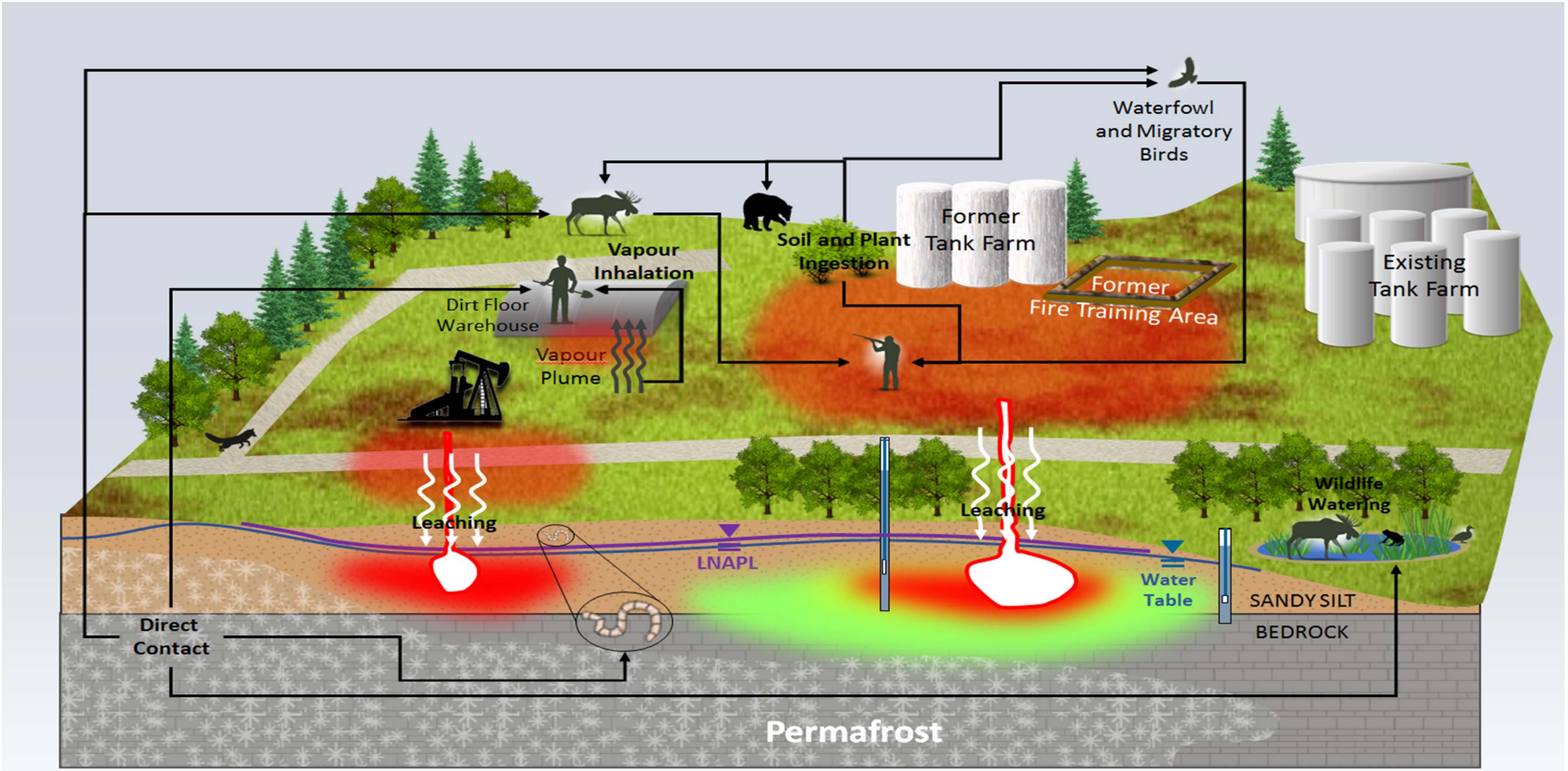
FIG No 7

REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG

PLOT DATE & TIME: 29/5/2018 9:19:12 AM
SAVE DATE & TIME: 29/5/2018 8:58:54 AM
USER NAME: blair.fink
ISSUING OFFICE: CALGARY



IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL

Date:	Drawn by:	Edited by:	App'd by:
17-May-18	AH	LG	MB

OneWay™ to zero harm

Advision
WorleyParsons Group

WorleyParsons Project No.
407011-00622

FIG No. **8**

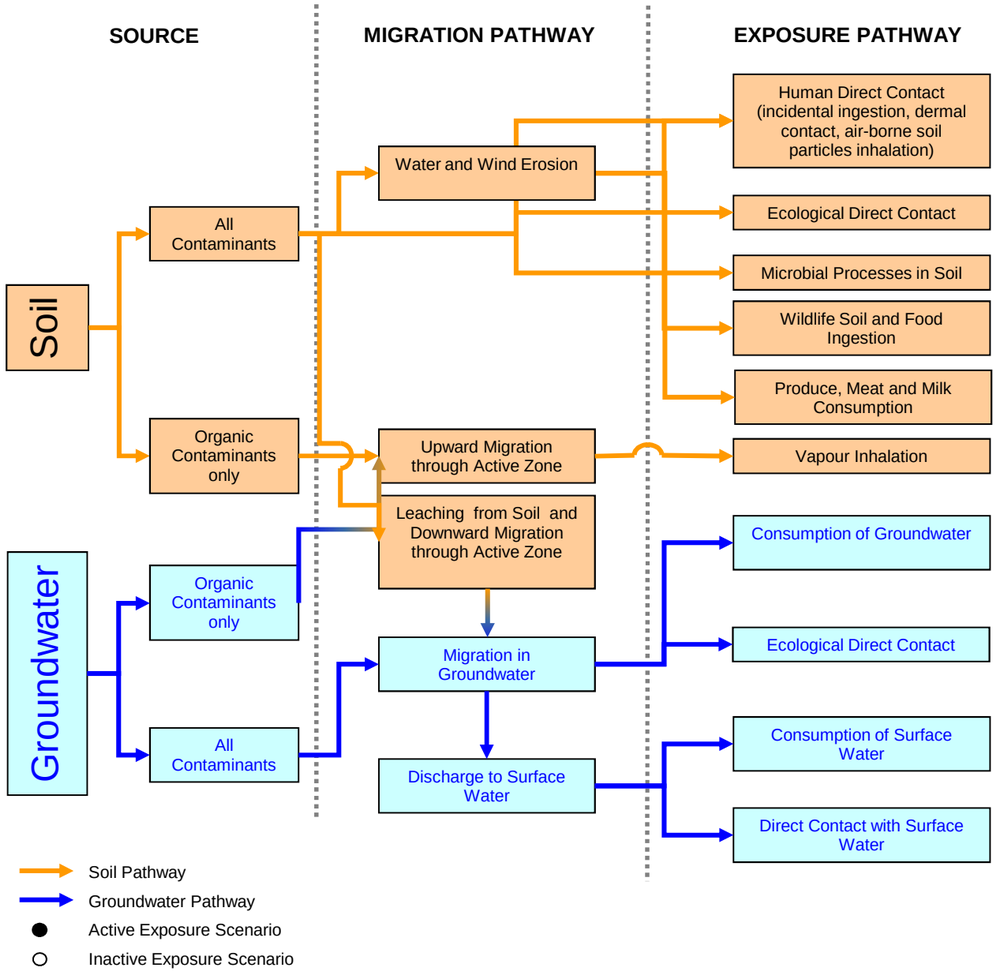
REV **A**

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE DIRECTORY: U:\CALIGBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\ML\S

FILE LOCATION: CALGARY

B-38X Area - Conceptual Exposure Model Flow Chart
(Current Land Use and Site Conditions)



RECEPTORS

Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
●			
		●	
		●	
	●		
●[1]			
○			
		●	
○	●		
			●

Notes: 1) Although the current land use is industrial, it is recognized that due to the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site, and hunters are able to hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
B-38X AREA, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AH	LG	MB

OneWay™ to zero harm

Advision
WorleyParsons Group

WorleyParsons Project No.
407011-00622

FIG No. 9 REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\B38X

Tables



Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Barium - Extractable (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**601**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
B40-08-01	28-Jul-2008	0.0 - 0.15m	0.88	0.7	---	< 1	**22** [#1]	220	---	0.5	0.2	34	< 0.15	17	27	20	0.15	2.0	53	0.6	< 1	< 0.3	< 1	---	56	150
	28-Jul-2008	0.15 - 0.3m	1	0.8	---	1	**26** [#1]	250	---	0.5	0.4	34	< 0.15	15	25	29	0.07	3.5	56	0.8	< 1	0.4	< 1	---	53	140
B40-08-02	28-Jul-2008	0.0 - 0.15m	0.72	0.4	---	< 1	**26** [#1]	260	---	0.5	0.2	37	< 0.15	17	27	29	0.08	1.4	56	< 0.5	< 1	< 0.3	< 1	---	53	150
	28-Jul-2008	0.15 - 0.3m	0.62	0.3	---	< 1	**22** [#1]	210	---	0.4	0.2	34	< 0.15	17	26	20	0.07	0.9	55	< 0.5	< 1	< 0.3	< 1	---	53	150
B38X00-1	20-Jul-2000	0.0 - 1.0m	0.431	0.32	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-2	20-Jul-2000	1.0 - 2.0m	0.51	0.68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-3	20-Jul-2000	1.0 - 2.0m	1.7	0.53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-4	20-Jul-2000	2.0 - 3.0m	1.2	0.19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-5	22-Jul-2000	2.0 - 3.0m	0.535	0.44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-S07-1	15-Aug-2007	Unknown	**7.66** [#1]	9.5	---	< 1	8	369	---	< 0.4	0.7	14	< 0.2	8	18	11	< 0.05	2.0	23	0.5	< 1	< 0.3	< 1	---	24	84
FTA-S07-2	15-Aug-2007	Unknown	**5.57** [#1]	2.9	---	< 1	7	317	---	< 0.4	0.5	13	< 0.2	6	19	10	< 0.05	3.7	23	1.0	< 1	< 0.3	< 1	---	21	71
FTA-S07-3	15-Aug-2007	Unknown	3.09	1.4	---	< 1	6	292	---	< 0.4	0.7	14	< 0.2	6	14	16	0.07	5.0	22	0.5	< 1	0.3	< 1	---	23	67
FTA-S07-4	15-Aug-2007	Unknown	3.82	3.5	---	< 1	8	430	---	< 0.4	0.7	19	< 0.2	9	21	13	< 0.05	3.3	28	1.2	< 1	0.3	< 1	---	30	101
FTA-S07-5	15-Aug-2007	Unknown	**42.4** [#1]	2.3	---	< 1	8	379	---	< 0.4	0.5	12	< 0.2	7	16	11	< 0.05	2.2	21	0.6	< 1	< 0.3	< 1	---	24	76
FTA-S07-6	15-Aug-2007	Unknown	**10.7** [#1]	11.0	---	< 1	6	243	---	< 0.4	0.4	13	< 0.2	5	13	13	< 0.05	3.3	17	< 0.5	< 1	< 0.3	< 1	---	18	58
FTA-TP07-1	18-Sep-2007	0.0 - 0.5m	0.84	1.0	---	< 1	9	283	---	0.5	0.5	16	< 0.2	9	19	17	0.05	3.3	29	0.8	< 1	0.3	< 1	---	32	93
	18-Sep-2007	0.5 - 1.0m	0.46	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2007	1.0 - 2.0m	0.41	1.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2007	2.0 - 3.5m	0.49	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-TP07-2	18-Sep-2007	2.0 - 3.0m	0.48	0.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	0.0 - 0.5m	1.07	0.8	---	< 1	9	269	---	< 0.4	0.7	12	< 0.2	8	17	19	0.41	8.5	26	1.0	< 1	0.7	< 1	---	30	92
	19-Sep-2007	0.5 - 1.0m	0.44	1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	1.0 - 2.0m	0.46	1.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	3.0 - 4.0m	0.8	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																				
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Barium - Extractable (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
CCME Industrial Fine Sub-Surface [#2]			**4**	**12**	**(6 - 8)**	**40**	**12**	**2000**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**601**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
FTA-TP07-3	19-Sep-2007	0.0 - 0.5m	0.49	2.8	---	< 1	**13 [#1]**	370	---	0.6	0.5	29	< 0.2	14	30	20	0.05	1.9	45	0.6	< 1	< 0.3	< 1	---	40	128
	19-Sep-2007	0.5 - 1.0m	0.56	1.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	1.0 - 2.0m	0.62	1.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	2.0 - 3.0m	0.46	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	3.0 - 4.0m	0.37	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-TP07-4	19-Sep-2007	0.0 - 0.5m	0.78	1.6	---	< 1	**12 [#1]**	325	---	0.5	0.4	29	< 0.2	12	21	15	< 0.05	2.6	39	< 0.5	< 1	< 0.3	< 1	---	43	105
	19-Sep-2007	0.5 - 2.0m	0.3	0.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	2.0 - 3.0m	0.38	0.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA01-02	24-Jun-2001	0.0 - 1.5m	0.414	0.70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)
8. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH														
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			110	330	430	230	---	---	---	---	---	0.28	320	32	10	72	5.3	10	10	180	0.25	10	0.013	0.046	100
CCME Industrial Fine Sub-Surface [#2]			620	660	860	460	---	---	---	---	---	0.28	320	32	10	72	5.3	10	10	180	0.25	10	0.013	0.046	100
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	320	260	2500	6600	6600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	800	1000	5000	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B40-08-01	28-Jul-2008	0.0 - 0.15m	0.67	< 0.020	0.65	3.6	270	**2700** [#3]	**8400** [#3]	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2008	0.15 - 0.3m	37	0.85	74	**310** [#1]	**8600** [#3]	**4600** [#3]	**25000** [#3]	**9100** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B40-08-02	28-Jul-2008	0.0 - 0.15m	8.0	< 0.020	0.65	3.5	280	**2000** [#3]	**5000** [#3]	1200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2008	0.15 - 0.3m	28	< 0.020	2.5	23	**2900** [#3]	**2900** [#3]	**3900** [#3]	1100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B40-10-1	18-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	76	280	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Aug-2010	2.5 - 3.0m	7.7	< 0.020	< 0.010	< 0.040	180	**730** [#3]	1400	550	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Aug-2010	4.0 - 4.5m	0.20	< 0.020	< 0.010	8.2	**2300** [#4]	**6200** [#4]	**9900** [#4]	3400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B40-10-2	11-Aug-2010	0.0 - 0.3m	3.1	< 0.020	0.16	1.2	54	**740** [#3]	1100	230	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2010	0.3 - 0.6m	8.5	< 0.020	2.3	11	**1000** [#3]	**4300** [#3]	2500 [#3]	290	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2010	0.6 - 1.0m	37	< 0.044	16	52	**3300** [#3]	**8000** [#3]	**3100** [#3]	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B40-10-3	19-Aug-2010	0.0 - 0.5m	0.077	0.12	0.048	0.21	< 12	**300** [#3]	**10000** [#3]	5300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2010	1.5 - 2.0m	34	2.4	0.98	2.8	290	12	190	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2010	1.5 - 2.0m	25	5.0	0.88	2.5	250	11	250	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2010	3.6 - 4.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	89	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-12-1	29-Jul-2012	2.0 - 2.5m	1.8	0.032	2.1	1.6	**590** [#3]	17	44	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	3.9 - 4.4m	32	48	35	120	**8900** [#4]	860	630	92	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	5.0 - 5.5m	8.4	0.037	0.23	0.66	< 12	36	470	300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-12-2	29-Jul-2012	1.0 - 1.4m	11	< 0.020	0.21	< 0.040	< 12	< 10	76	29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	3.3 - 3.8m	86	170	66	290	**8900** [#4]	**1200** [#4]	690	99	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Jul-2012	3.3 - 3.8m	72	160	61	260	**11000** [#4]	**1400** [#4]	850	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	4.2 - 4.5m	5.9	4.9	9.5	42	**2000** [#4]	350	470	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-12-3	28-Jul-2012	1.0 - 1.5m	7.4	< 0.020	2.7	< 0.040	**2100** [#3]	44	180	74	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	1.9 - 2.4m	37	72	37	130	**9500** [#3]	**840** [#3]	640	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2012	3.0 - 3.5m	16	2.0	14	53	**2100** [#4]	320	870	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	4.0 - 4.5m	0.24	0.10	0.10	0.27	180	560	1600	620	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-E2	01-Sep-2003	Unknown	29	120	41	188	**6500** [#3]	**1000** [#3]	780	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-E3	26-Aug-2003	Unknown	63	160	44	195	**11000** [#3]	**1900** [#3]	1100	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-E4	24-Aug-2003	Unknown	43	120	60	**241** [#1]	**5000** [#3]	**1800** [#3]	**11000** [#3]	4700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LT7-E5	29-Aug-2003	Unknown	24	66	28	117	**4500** [#3]	**530** [#3]	410	82	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 02-24-7	20-Jul-2002	6.0 - 7.0m	0.20	0.19	0.21	2.85	**610** [#3]	**2400** [#3]	**4900** [#3]	1600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH														
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38-12-1/B38-N-OBS-59	29-Jul-2012	0.8 - 1.4m	71	310	28	**890** [#1]	**22000** [#3]	**2500** [#3]	**3100** [#3]	630	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	1.5 - 1.8m	**400** [#1]	**1500** [#1]	390	**1800** [#1]	**53000** [#3]	**14000** [#3]	**11000** [#3]	1700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	3.5 - 4.0m	1.1	2.5	0.30	1.7	68	400	660	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38-12-2/B38-N-OBS-60	29-Jul-2012	1.0 - 1.5m	16	0.17	20	69	**3000** [#3]	**5500** [#3]	**29000** [#3]	**12000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	2.0 - 2.5m	39	150	54	**240** [#1]	**8100** [#3]	**1400** [#3]	1200	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Jul-2012	2.0 - 2.5m	41	180	63	**290** [#1]	**10000** [#3]	**1800** [#3]	1600	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	5.0 - 5.5m	29	75	25	120	**5600** [#4]	**2800** [#4]	2700	650	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38-12-3/B38-N-OBS-61	29-Jul-2012	0.4 - 0.9m	6.5	11	21	63	**3300** [#3]	**2300** [#3]	1800	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	4.5 - 5.0m	0.29	0.48	0.47	6.2	**1100** [#3]	**3500** [#4]	**6000** [#4]	2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Jul-2012	4.5 - 5.0m	0.31	0.35	< 0.010	6.9	600	**2600** [#4]	4500	1500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	5.5 - 6.0m	< 0.0050	0.16	< 0.010	3.5	350	**1200** [#4]	2000	680	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38-12-4/B38-N-OBS-62	29-Jul-2012	1.2 - 1.5m	0.56	0.026	0.024	< 0.070	< 12	**530** [#3]	**4400** [#3]	2200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	2.5 - 3.0m	11	18	6.7	32	**1500** [#3]	**1200** [#3]	900	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	4.0 - 4.5m	24	72	22	100	**4300** [#4]	**2400** [#4]	1400	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2012	5.0 - 5.5m	5.1	0.21	4.4	21	**1000** [#4]	**3300** [#4]	**5000** [#4]	1500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3803-04	14-Jul-2003	0.0 - 1.5m	39	19	62	**260** [#1]	**9000** [#3]	**820** [#3]	420	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2003	3.0 - 4.5m	5.2	1.9	0.38	1.2	60	76	460	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3803-05	14-Jul-2003	0.0 - 1.5m	59	180	70	**440** [#1]	**9200** [#3]	**1100** [#3]	840	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2003	3.0 - 4.5m	9.6	20	15	55	**3700** [#4]	**17000** [#4]	**29000** [#4]	8000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3803-06	14-Jul-2003	0.0 - 1.5m	0.09	< 0.10	< 0.10	0.3	**320** [#3]	**2900** [#3]	**15000** [#3]	5300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2003	1.5 - 3.0m	0.57	< 0.10	< 0.10	< 0.1	14	24	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3803-07	14-Jul-2003	0.0 - 1.5m	45	120	46	190	**4200** [#3]	**1100** [#3]	1000	290	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2003	1.5 - 3.0m	3.6	36	14	71	**1400** [#3]	170	810	260	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Jul-2003	3.0 - 4.5m	0.32	0.93	0.45	6.2	100	76	480	190	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3803-08	13-Jul-2003	0.0 - 1.5m	0.67	< 0.10	0.45	1.36	210	48	1800	1100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Jul-2003	4.5 - 6.0m	< 0.04	< 0.10	< 0.10	0.45	260	**2000** [#4]	4600	1700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH														
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3803-09	13-Jul-2003	0.0 - 1.5m	< 0.04	< 0.10	< 0.10	< 0.2	< 10	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E1	30-Aug-2003	Unknown	4.2	16	4.0	20	**570** [#3]	76	160	68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E2	13-Sep-2003	Unknown	61	230	67	**359** [#1]	**6900** [#3]	**3800** [#3]	**6000** [#3]	1600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E3	12-Sep-2003	Unknown	1.6	4.5	2.9	11.4	**700** [#3]	**780** [#3]	760	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E5	09-Sep-2003	Unknown	< 0.04	< 0.10	< 0.10	< 0.2	18	**3000** [#3]	2300	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E6	07-Sep-2003	Unknown	26	140	63	**291** [#1]	**4600** [#3]	**9400** [#3]	**12000** [#3]	3100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E7	03-Sep-2003	Unknown	2.6	3.5	3.2	44	**1400** [#3]	**2500** [#3]	**4500** [#3]	1700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-E8	09-Sep-2003	Unknown	12	98	41	199	**1100** [#3]	**3300** [#3]	**2500** [#3]	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-S-E2	02-Sep-2003	Unknown	0.59	1.0	1.2	14.9	**2100** [#3]	**440** [#3]	430	98	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-S-E3	18-Aug-2003	Unknown	61	230	73	**375** [#1]	**12000** [#3]	**2200** [#3]	1600	210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-S-E5	22-Aug-2003	Unknown	9.3	37	15	79	**2800** [#3]	**4600** [#3]	**3100** [#3]	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-S-E6	14-Aug-2003	Unknown	1.4	8.2	6.1	35	**1500** [#3]	**410** [#3]	560	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-S-E7	16-Aug-2003	Unknown	1.2	6.1	5.3	35	**1700** [#3]	**1100** [#3]	980	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-1	20-Jul-2000	0.0 - 1.0m	< 0.04	< 0.10	< 0.10	0.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2000	1.0 - 2.0m	< 0.04	< 0.10	< 0.10	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-2	20-Jul-2000	1.0 - 2.0m	8.1	19	8.8	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Jul-2000	5.0 - 6.0m	0.19	0.29	< 0.10	0.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-3	20-Jul-2000	1.0 - 2.0m	26	190	62	**230** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Jul-2000	6.0 - 7.0m	0.09	< 0.10	< 0.10	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X00-4	20-Jul-2000	2.0 - 3.0m	**120** [#1]	**490** [#1]	130	**560** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2000	5.0 - 6.0m	0.20	0.59	0.17	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-12-1/FTA-OBS-56	30-Jul-2012	1.0 - 1.3m	20	55	38	180	**4200** [#3]	**1200** [#3]	1800	380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2012	3.4 - 3.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	46	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2012	3.7 - 4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	39	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-12-2/FTA-OBS-57	30-Jul-2012	1.1 - 1.5m	0.56	0.047	0.27	1.4	250	**1800** [#3]	**3400** [#3]	640	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2012	1.8 - 2.4m	73	190	48	200	**7600** [#3]	**850** [#3]	700	90	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	30-Jul-2012	1.8 - 2.4m	74	200	50	210	**8100** [#3]	**1300** [#3]	940	91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2012	5.0 - 5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	19	150	80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-12-3/FTA-OBS-58	30-Jul-2012	0.5 - 1.0m	0.060	0.13	0.028	0.66	**370** [#3]	**1500** [#3]	**4500** [#3]	970	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2012	3.5 - 4.0m	5.2	< 0.020	< 0.010	< 0.040	< 12	< 10	67	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2012	5.0 - 5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	73	29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-E2	21-Aug-2003	Unknown	50	250	67	**359** [#1]	**9100** [#3]	**310** [#3]	290	36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-E3	25-Aug-2003	Unknown	77	210	48	218	**1000** [#3]	**860** [#3]	460	56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH														
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			110	330	430	230	---	---	---	---	---	0.28	320	32	10	72	5.3	10	10	180	0.25	10	0.013	0.046	100
CCME Industrial Fine Sub-Surface [#2]			620	660	860	460	---	---	---	---	---	0.28	320	32	10	72	5.3	10	10	180	0.25	10	0.013	0.046	100
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	320	260	2500	6600	6600	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	800	1000	5000	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-E4	31-Aug-2003	Unknown	0.79	1.4	1.6	12	**1200** [#3]	210	170	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-E5	23-Aug-2003	Unknown	11	40	13	61	**1400** [#3]	**600** [#3]	1000	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-N-E1	22-Sep-2008	Unknown	42	160	44	210	**5200** [#3]	**500** [#3]	390	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-N-E2	22-Sep-2008	Unknown	5.6	23	12	57	**2000** [#3]	200	560	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-N-E3	22-Sep-2008	Unknown	9.7	15	8.5	39	**1200** [#3]	**380** [#3]	250	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-N-E4	25-Sep-2008	Unknown	9.8	44	16	67	**2300** [#3]	**2100** [#3]	2100	500	2200	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-N-E5	24-Sep-2008	Unknown	11	40	17	81	**1900** [#3]	**1800** [#3]	**2600** [#3]	490	2200	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-N-E6	24-Sep-2008	Unknown	15	57	28	130	**4100** [#3]	**1400** [#3]	**3400** [#3]	950	3900	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-S07-1	15-Aug-2007	Unknown	0.041	0.076	0.065	0.17	< 10	113	1470	744	---	< 0.0050	< 0.0050	< 0.0050	0.0084	0.0055	---	< 0.0050	< 0.0050	< 0.0050	0.0068	< 0.0050	**0.0178** [#1]	0.0381	0.0151
FTA-S07-2	15-Aug-2007	Unknown	0.12	0.26	0.11	0.31	< 10	66	1800	886	---	< 0.0050	< 0.0050	< 0.0050	0.0107	0.0079	---	< 0.0050	< 0.0050	0.0052	0.0053	< 0.0050	**0.0206** [#1]	0.0374	0.0139
FTA-S07-3	15-Aug-2007	Unknown	0.072	0.047	0.10	0.15	< 10	247	**3790** [#3]	1750	6500	< 0.0050	< 0.0050	< 0.0050	0.0069	< 0.0050	---	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.0213** [#1]	**0.0680** [#1]	0.0489
FTA-S07-4	15-Aug-2007	Unknown	0.052	0.17	0.078	0.33	< 10	**363** [#3]	**5310** [#3]	2480	**9800** [#3]	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	---	< 0.0050	< 0.0050	< 0.0050	0.0066	< 0.0050	**0.0229** [#1]	**0.0715** [#1]	0.0300
FTA-S07-5	15-Aug-2007	Unknown	0.048	0.14	0.054	0.13	< 10	26	448	438	---	< 0.0050	< 0.0050	< 0.0050	0.0068	< 0.0050	---	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.0148** [#1]	0.0308	0.0123
FTA-S07-6	15-Aug-2007	Unknown	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	204	1010	653	---	< 0.0050	< 0.0050	< 0.0050	0.0097	0.0067	---	0.0077	< 0.0050	0.0094	< 0.0050	0.0194	< 0.0050	0.0453	0.0746
FTA-TP07-1	18-Sep-2007	0.0 - 0.5m	0.52	3.3	< 1.0	**650** [#1]	**12600** [#3]	**6180** [#3]	**11700** [#3]	1570	**11000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2007	0.5 - 1.0m	**220** [#1]	**590** [#1]	150	**700** [#1]	**20900** [#3]	**2210** [#3]	**2680** [#3]	363	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2007	1.0 - 2.0m	40	160	47	220	**5560** [#3]	**1150** [#3]	1190	188	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-2007	2.0 - 3.5m	86	240	56	**250** [#1]	**6140** [#3]	**1180** [#3]	1050	156	---	0.0322	< 0.0050	< 0.0050	< 0.0050	< 0.0050	---	< 0.0050	< 0.0050	< 0.0050	0.221	0.0059	**1.19** [#1]	**0.410** [#1]	0.0142
FTA-TP07-2	18-Sep-2007	2.0 - 3.0m	38	99	25	110	**2790** [#3]	**1510** [#3]	1400	322	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	0.0 - 0.5m	0.41	0.37	0.075	0.48	20	228	1620	642	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	0.5 - 1.0m	28	0.95	12	42	**1750** [#3]	**999** [#3]	**18900** [#3]	**12500** [#3]	**38000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	1.0 - 2.0m	35	120	30	53	**3580** [#3]	**1840** [#3]	1700	385	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	3.0 - 4.0m	0.57	0.84	0.22	0.99	21	20	51	35	---	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0227	---	< 0.0050	0.0128	< 0.0050	0.0083	< 0.0050	**0.0476** [#1]	0.0316	0.0118

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH														
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME Industrial Fine Sub-Surface [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**0.013**	**0.046**	**100**
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-TP07-3	19-Sep-2007	0.0 - 0.5m	16	0.81	14	110	**3860** [#3]	**3600** [#3]	**7450** [#3]	2110	**10000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	0.5 - 1.0m	81	200	64	**300** [#1]	**9310** [#3]	**5450** [#3]	**4400** [#3]	852	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	1.0 - 2.0m	**110** [#1]	**330** [#1]	77	**360** [#1]	**9580** [#3]	**2260** [#3]	1750	241	---	0.0940	< 0.0050	< 0.0050	< 0.0050	0.0254	---	< 0.0050	< 0.0050	< 0.0050	0.628	< 0.0050	**3.03** [#1]	**1.15** [#1]	0.0323
	19-Sep-2007	2.0 - 3.0m	11	20	5.4	22	**384** [#3]	256	231	49	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	3.0 - 4.0m	4.0	0.15	0.31	0.28	< 10	21	46	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-TP07-4	19-Sep-2007	0.0 - 0.5m	< 0.0050	0.024	0.033	0.15	28	**725** [#3]	2340	835	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	0.5 - 2.0m	39	99	51	220	**5680** [#3]	**6260** [#3]	**6300** [#3]	1620	**7800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2007	2.0 - 3.0m	0.068	0.041	0.037	0.15	< 10	23	67	207	---	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	---	< 0.0050	0.0144	< 0.0050	< 0.0050	0.0055	**0.0165** [#1]	0.0233	0.0114
FTA01-01	24-Jun-2001	0.0 - 1.5m	35	92	46	170	**7300** [#3]	**280** [#3]	930	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	3.0 - 4.5m	0.39	1.0	0.39	1.3	34	**1000** [#4]	2600	730	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA01-02	24-Jun-2001	0.0 - 1.5m	6.4	28	10	140	**6500** [#3]	**2000** [#3]	**8800** [#3]	2100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jun-2001	1.5 - 3.0m	**160** [#1]	**500** [#1]	110	**490** [#1]	**13000** [#3]	**480** [#3]	1300	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA01-03	24-Jun-2001	0.0 - 1.5m	50	280	95	**440** [#1]	**11000** [#3]	**430** [#3]	1200	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Soil Quality Guidelines for Industrial Land Use, Fine-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Industrial Land Use, Fine-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
		Inorganic Parameters and Phenols					Dissolved Metals															
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
LT7-OBS-53	19-Aug-2012	36	7.50	< 0.0030	< 0.0030	**140** [#1]	0.0027	**0.0061** [#1]	0.10	0.000025	< 0.0010	0.0012	**0.41** [#1]	**0.021** [#1]	---	0.0042	0.0087	**0.0024** [#1]	< 0.00010	< 0.00020	0.011	0.0098
B38 00-28-6	17-Sep-2000	8.1	6.9	< 0.02	0.005	**23** [#1]	< 0.02	0.003	0.057	**0.0003** [#1]	< 0.005	**< 0.005** [#1]	**0.645** [#1]	< 0.001	**< 0.00005** [#1]	< 0.005	0.025	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	0.015
	26-Aug-2001	8.0	7.6	< 0.02	< 0.005	**5** [#1]	< 0.02	**< 0.05** [#1]	0.056	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**0.815** [#1]	**< 0.03** [#1]	---	< 0.005	0.018	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	0.007
	20-Aug-2002	5.8	7.7	< 0.02	< 0.005	**18** [#1]	0.013	0.004	0.068	**0.00018** [#1]	< 0.001	**0.0129** [#1]	**1.53** [#1]	< 0.0005	**< 0.00005** [#1]	0.006	0.016	**0.001** [#1]	< 0.0001	0.0001	0.00384	**0.032** [#1]
	24-Aug-2005	17.3	---	< 0.2	< 0.06	---	0.009	< 0.005	0.07	**0.00029** [#1]	< 0.007	**0.0278** [#1]	**1.84** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.022	**0.002** [#1]	< 0.0001	< 0.0008	0.007	**0.039** [#1]
	21-Aug-2006	7	---	< 0.2	< 0.06	**17** [#1]	---	< 0.005	0.05	0.00003	< 0.007	**0.005** [#1]	0.271	< 0.001	**< 0.00005** [#1]	< 0.006	0.017	< 0.001	< 0.0001	---	0.004	< 0.005
	23-Aug-2006	---	---	---	---	---	< 0.005	< 0.005	---	0.00003	---	**0.005** [#1]	---	< 0.001	---	---	---	< 0.001	< 0.0001	< 0.0008	0.004	---
	19-Aug-2008	14	---	0.11	0.008	**6** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	22-Aug-2010	18	7.87	0.061	0.025	**9** [#1]	0.004	0.0009	0.09	**0.000091** [#1]	< 0.001	**0.0049** [#1]	< 0.06	< 0.0002	---	0.0039	0.0073	0.0005	< 0.0001	< 0.0002	0.0069	0.008
	19-Aug-2011	20	---	0.27	0.022	< 2	< 0.01	< 0.002	0.08	**0.00012** [#1]	**< 0.01** [#1]	**0.004** [#1]	0.07	< 0.002	---	< 0.002	0.008	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.006	< 0.03
B38 00-32-44	19-Dec-2000	66.4	6.90	< 0.003	< 0.003	---	---	---	---	---	---	---	0.02	---	---	---	---	---	---	---	---	---
	21-Jul-2001	**240** [#1]	7.2	< 0.02	< 0.005	---	< 0.02	**< 0.05** [#1]	0.399	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**5.68** [#1]	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	29-Aug-2001	**312** [#1]	8.0	< 0.02	< 0.005	**155** [#1]	**0.34** [#1]	**< 0.05** [#1]	0.476	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**1.46** [#1]	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	20-Aug-2002	**300** [#1]	7.7	< 0.02	< 0.005	---	0.05	**0.06** [#1]	0.472	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.147	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	25-Aug-2003	**1910** [#1]	7.3	< 0.2	< 0.06	---	---	**0.006** [#1]	1.073	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**12.23** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	0.007
B38 02-17-3	20-Aug-2002	**281** [#1]	7.4	0.05	< 0.005	**59** [#1]	**0.294** [#1]	**0.011** [#1]	0.085	**0.00051** [#1]	< 0.001	**0.0068** [#1]	**7.05** [#1]	**0.0097** [#1]	**< 0.00005** [#1]	< 0.005	0.023	**0.003** [#1]	< 0.0001	< 0.0001	0.00614	**0.044** [#1]
	25-Aug-2003	**333** [#1]	**6.5** [#1]	< 0.2	< 0.06	---	---	**0.007** [#1]	0.211	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**13.68** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.002** [#1]	---	---	**< 1.0** [#1]	**0.041** [#1]
	23-Aug-2004	22	7.0	< 0.2	< 0.06	---	< 0.050	**< 0.050** [#1]	0.063	**< 0.000170** [#1]	< 0.005	**0.046** [#1]	**14.51** [#1]	**< 0.010** [#1]	**< 0.00005** [#1]	< 0.005	0.013	**< 0.010** [#1]	**< 0.0010** [#1]	**< 0.0080** [#1]	< 0.010	< 0.005
	24-Aug-2005	**153** [#1]	7.3	< 0.2	< 0.06	**24** [#1]	0.0321	**0.0196** [#1]	0.06	0.00003	< 0.007	**0.006** [#1]	**0.807** [#1]	< 0.001	**0.00006** [#1]	< 0.006	0.033	**0.002** [#1]	< 0.0001	< 0.0008	0.004	< 0.005
	21-Aug-2006	**424** [#1]	7.3	< 0.2	< 0.06	**43** [#1]	---	**0.008** [#1]	0.06	**0.00072** [#1]	< 0.007	**0.01** [#1]	**11.2** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.057	**0.002** [#1]	< 0.0001	---	0.008	0.009
	23-Aug-2006	---	---	---	---	---	0.018	**0.008** [#1]	---	**0.00072** [#1]	---	**0.01** [#1]	---	< 0.001	---	---	---	**0.002** [#1]	< 0.0001	< 0.0008	0.008	---
	20-Aug-2007	**404** [#1]	6.9	< 0.2	< 0.06	**14** [#1]	0.072	**0.011** [#1]	0.04	< 0.00001	0.008	0.0017	**38.5** [#1]	0.0002	---	0.0018	0.0438	**0.009** [#1]	**0.0002**	**0.0011** [#1]	0.0035	0.008
	19-Aug-2008	**370** [#1]	7.1	< 0.003	< 0.003	**66** [#1]	0.055	**0.009** [#1]	0.03	0.00006	0.002	**0.0067** [#1]	**28** [#1]	0.0003	---	0.0023	0.045	**0.001** [#1]	< 0.0001	< 0.0002	0.0088	0.021
(Duplicate)	19-Aug-2008	---	---	---	---	**47** [#1]	0.079	**0.011** [#1]	0.04	0.00006	0.002	0.0019	**32** [#1]	0.0003	---	0.0028	0.052	**0.002** [#1]	< 0.0001	< 0.0002	0.011	**0.053** [#1]
	19-Aug-2009	89	7.88	0.057	0.015	3	0.023	0.0034	0.09	**0.00016** [#1]	< 0.001	**0.0047** [#1]	**4.3** [#1]	0.0003	---	0.044	0.039	**0.0015** [#1]	< 0.0001	0.0002	**0.044** [#1]	0.024
(Duplicate)	19-Aug-2009	---	---	---	---	3	0.025	0.0043	0.09	**0.00014** [#1]	< 0.001	0.0035	**5.8** [#1]	0.0002	---	0.038	0.035	**0.0017** [#1]	< 0.0001	0.0002	**0.042** [#1]	0.020
	22-Aug-2010	110	7.25	1.6	0.014	**5** [#1]	0.07	**0.006** [#1]	0.08	**0.00017** [#1]	**< 0.01** [#1]	**0.011** [#1]	**1.6** [#1]	< 0.002	---	0.007	0.032	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.013	< 0.03
	17-Aug-2011	18	---	0.044	0.006	**4** [#1]	0.025	0.0023	0.13	< 0.00003	< 0.001	0.0004	**8.4** [#1]	< 0.0002	---	0.0063	0.013	**0.0020** [#1]	< 0.0001	< 0.0002	**0.021** [#1]	0.010
	19-Aug-2012	30	---	0.10	0.011	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	6.4	---	0.014	0.014	**4.1** [#1]	0.012	0.0011	0.13	< 0.000020	< 0.0010	0.0024	**2.4** [#1]	< 0.00020	---	0.0037	0.0081	0.00068	< 0.00010	< 0.00020	0.011	0.0051
B38 02-24-7	20-Aug-2002	14.8	7.8	< 0.02	< 0.005	**18** [#1]	0.012	0.001	0.083	**0.00049** [#1]	< 0.001	**0.0066** [#1]	**6.39** [#1]	0.0016	**< 0.00005** [#1]	< 0.005	0.013	**0.002** [#1]	< 0.0001	< 0.0001	**0.0152** [#1]	**0.035** [#1]
	25-Aug-2003	20	6.8	0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**8.119** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.003** [#1]	---	---	**< 1.0** [#1]	0.008
	23-Aug-2004	18	7.2	< 0.2	< 0.06	---	< 0.010	**< 0.010** [#1]	0.076	< 0.000034	< 0.005	**0.006** [#1]	**11.97** [#1]	< 0.002	**< 0.00005** [#1]	< 0.005	0.026	**0.005** [#1]	< 0.0002	**< 0.0016** [#1]	**0.027** [#1]	< 0.005

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
Inorganic Parameters and Phenols							**Dissolved Metals**															
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3** [#1]	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38 02-36-3	20-Aug-2002	13.7	7.8	< 0.02	< 0.005	**15** [#1]	0.072	**0.006** [#1]	0.034	**0.00009** [#1]	0.001	0.0012	**30.4** [#1]	< 0.0005	**< 0.00005** [#1]	< 0.005	0.024	**0.001** [#1]	< 0.0001	< 0.0001	0.00326	**0.039** [#1]
	24-Aug-2003	14	6.8	< 0.2	< 0.06	---	---	**0.015** [#1]	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**17.92** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	0.008
	22-Aug-2004	10	7.2	< 0.2	< 0.06	---	< 0.005	< 0.005	0.031	0.000053	< 0.005	< 0.002	**19.96** [#1]	< 0.001	**< 0.00005** [#1]	< 0.005	0.021	**0.002** [#1]	< 0.0001	< 0.0008	0.003	< 0.005
	25-Aug-2005	13.1	7.5	< 0.2	< 0.06	**16** [#1]	0.005	**0.008** [#1]	< 0.05	0.00002	< 0.007	**0.008** [#1]	**23.9** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.012	**0.003** [#1]	< 0.0001	< 0.0008	0.003	**0.081** [#1]
(Duplicate)	25-Aug-2005	---	---	---	---	**14** [#1]	0.005	**0.008** [#1]	< 0.05	0.00001	< 0.007	**0.005** [#1]	**25.6** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.008	**0.002** [#1]	< 0.0001	< 0.0008	0.003	**0.081** [#1]
	21-Aug-2006	12	7.6	< 0.2	< 0.06	**15** [#1]	< 0.005	**0.007** [#1]	< 0.05	**0.00013** [#1]	< 0.007	< 0.002	**28.3** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.022	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
(Duplicate)	21-Aug-2006	---	---	---	---	**27** [#1]	---	**0.008** [#1]	< 0.05	0.00007	< 0.007	< 0.002	**33.7** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.021	**0.004** [#1]	< 0.0001	---	< 0.001	0.014
	19-Aug-2008	18	7.4	< 0.003	< 0.003	**17** [#1]	< 0.001	0.002	0.03	0.00001	< 0.001	**0.0074** [#1]	**3.3** [#1]	< 0.0002	---	< 0.0002	0.015	< 0.001	< 0.0001	< 0.0002	0.011	**0.27** [#1]
	17-Aug-2009	19	7.20	0.017	< 0.003	**14** [#1]	0.004	0.0022	< 0.02	0.000043	< 0.001	**0.0042** [#1]	0.11	< 0.0002	---	0.0008	0.013	0.0006	< 0.0001	< 0.0002	0.014	0.013
	19-Aug-2010	16	7.34	0.023	0.003	**4** [#1]	0.003	0.0035	< 0.02	0.000012	< 0.001	0.0012	**22** [#1]	< 0.0002	---	0.0007	0.015	0.0009	< 0.0001	< 0.0002	0.0058	0.011
	19-Aug-2012	13	---	0.0073	0.0054	**5.8** [#1]	0.012	**0.0093** [#1]	0.027	< 0.000025	< 0.0010	0.00065	**64** [#1]	< 0.00020	---	0.0014	0.017	**0.0011** [#1]	< 0.00010	< 0.00020	0.0011	0.0091
B38 03-37-5	25-Aug-2003	27	7.1	< 0.2	< 0.06	---	---	< 0.005	0.111	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**2.500** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.005** [#1]	---	---	**< 1.0** [#1]	< 0.005
B38 03-38-5	25-Aug-2003	33	7.1	< 0.2	< 0.06	---	---	< 0.005	0.104	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**1.342** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	0.014
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	34	7.7	< 0.2	< 0.06	---	< 0.005	**0.011** [#1]	0.115	< 0.000017	< 0.005	< 0.002	**5.482** [#1]	< 0.001	**< 0.00005** [#1]	< 0.005	< 0.008	**0.003** [#1]	< 0.0001	< 0.0008	0.002	< 0.005
	25-Aug-2005	21.9	7.9	< 0.2	< 0.06	**23** [#1]	< 0.005	**0.0187** [#1]	0.11	< 0.00001	< 0.007	< 0.002	**5.96** [#1]	< 0.001	**0.00006** [#1]	< 0.006	< 0.008	**0.007** [#1]	< 0.0001	< 0.0008	0.001	**0.103** [#1]
	21-Aug-2006	31	7.8	< 0.2	< 0.06	**28** [#1]	---	**0.009** [#1]	0.10	< 0.00001	< 0.007	< 0.002	**6.07** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	< 0.008	< 0.001	< 0.0001	---	< 0.001	< 0.005
	23-Aug-2006	---	---	---	---	---	< 0.005	**0.009** [#1]	---	< 0.00001	---	< 0.002	---	< 0.001	---	---	---	< 0.001	< 0.0001	< 0.0008	< 0.001	---
	20-Aug-2007	35	7.5	< 0.2	< 0.06	**44** [#1]	0.018	**0.013** [#1]	0.10	< 0.00001	**0.010** [#1]	0.0014	**3.03** [#1]	< 0.0002	---	0.0017	0.0018	**0.015** [#1]	< 0.0001	< 0.0002	0.0015	0.014
	19-Aug-2008	41	7.7	0.003	< 0.003	**66** [#1]	0.006	**0.009** [#1]	0.08	< 0.00001	< 0.001	**0.0051** [#1]	**7.1** [#1]	< 0.0002	---	0.0008	0.0027	< 0.001	< 0.0001	< 0.0002	0.0005	**0.085** [#1]
	17-Aug-2009	38	7.55	0.005	< 0.003	**25** [#1]	**0.11** [#1]	**0.0096** [#1]	0.09	0.000007	< 0.001	**0.0041** [#1]	**6.3** [#1]	0.0003	---	0.0013	0.0037	0.0004	< 0.0001	< 0.0002	0.0006	0.010
	22-Aug-2010	41	8.06	< 0.003	< 0.003	**47** [#1]	0.001	**0.0063** [#1]	0.10	0.000006	< 0.001	0.0009	**2.1** [#1]	< 0.0002	---	0.0022	0.0025	0.0006	< 0.0001	< 0.0002	0.0005	0.006
	19-Aug-2011	46	---	0.014	0.010	**35** [#1]	< 0.01	**0.011** [#1]	0.11	< 0.00005	**< 0.01** [#1]	< 0.002	**9.4** [#1]	< 0.002	---	0.003	< 0.005	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	< 0.001	< 0.03
	19-Aug-2012	49	---	< 0.0030	< 0.0030	**21** [#1]	0.0023	**0.011** [#1]	0.10	< 0.000025	< 0.0010	< 0.00020	**9.8** [#1]	< 0.00020	---	0.0036	0.0032	0.00084	< 0.00010	< 0.00020	0.00048	< 0.0030
	26-Aug-2013	68	---	0.0076	< 0.0030	**85** [#1]	< 0.0030	**0.0094** [#1]	0.10	< 0.000025	< 0.0010	**0.043** [#1]	**6.5** [#1]	< 0.00020	---	0.0071	0.0052	0.00076	< 0.00010	< 0.00020	0.00039	< 0.0030
	01-Aug-2014	85	---	0.11	< 0.010	**21** [#1]	0.0062	**0.015** [#1]	0.11	< 0.000020	< 0.0010	0.00092	**18** [#1]	< 0.00020	---	0.0026	0.0037	0.00043	< 0.00010	< 0.00020	0.00014	0.011
	09-Aug-2015	98	---	< 0.010	< 0.010	**19** [#1]	< 0.0030	**0.016** [#1]	0.11	< 0.000020	< 0.0010	0.0021	**18** [#1]	< 0.00020	---	0.0025	0.0020	0.00052	< 0.00010	< 0.00020	0.00015	0.011
	04-Aug-2016	96	---	< 0.010	< 0.010	---	0.0036	**0.0086** [#1]	0.098	< 0.000020	< 0.0010	0.00050	**7.1** [#1]	< 0.00020	---	0.0054	0.0055	0.00046	< 0.00010	< 0.00020	0.00029	0.0045
	13-Aug-2017	110	---	< 0.010	< 0.010	---	0.015	**0.014** [#1]	0.11	< 0.000020	< 0.0010	0.00021	**14** [#1]	< 0.00020	---	0.0043	0.0026	0.00045	< 0.00010	< 0.00020	0.00093	0.019
B38 03-40-5	25-Aug-2003	51	7.0	< 0.2	< 0.06	---	---	< 0.005	0.111	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**0.748** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.003** [#1]	---	---	**< 1.0** [#1]	< 0.005
B38 08-2-4	22-Aug-2010	14	7.41	< 0.003	< 0.003	**390** [#1]	0.008	0.0039	0.03	< 0.00003	< 0.001	0.0012	**12** [#1]	0.0011	---	< 0.0002	0.030	**0.0033** [#1]	< 0.0001	< 0.0002	0.0051	0.010
	17-Aug-2011	9	7.24	< 0.003	< 0.003	**190** [#1]	0.012	**0.0064** [#1]	0.03	0.000019	< 0.001	0.0014	**40** [#1]	0.0005	---	0.0002	0.035	**0.010** [#1]	< 0.0001	< 0.0002	0.0026	0.013
	26-Aug-2013	9.6	6.82	< 0.0030	0.0056	**110** [#1]	0.0083	**0.0075** [#1]	0.046	< 0.000025	< 0.0010	0.00070	**60** [#1]	< 0.00020	---	0.0014	0.030	**0.0023** [#1]	< 0.00010	< 0.00020	0.0091	< 0.0030
	09-Aug-2015	6.3	6.98	< 0.010	< 0.010	**170** [#1]	0.0079	0.0044	0.036	< 0.000020	< 0.0010	0.0021	**34** [#1]	0.00074	---	0.00064	0.026	**0.0029** [#1]	< 0.00010	< 0.00020	0.0030	0.0065
	03-Aug-2016	6.1	7.25	< 0.010	< 0.010	---	0.0085	**0.0064** [#1]	0.036	0.000022	< 0.0010	0.00062	**41** [#1]	0.00063	---	0.00089	0.024	**0.0013** [#1]	< 0.00010	< 0.00020	0.0032	0.011

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38 08-3-4	19-Aug-2008	36	7.5	0.010	< 0.003	**8** [#1]	---	---	---	---	---	---	**0.44** [#1]	---	---	---	---	---	---	---	---	---
	17-Aug-2009	19	7.63	0.035	< 0.003	< 2	0.009	0.0015	0.05	**0.00034** [#1]	< 0.001	**0.0073** [#1]	0.24	< 0.0002	---	0.0016	0.024	**0.0010** [#1]	< 0.0001	< 0.0002	0.0021	0.018
	22-Aug-2010	59	7.96	0.003	< 0.003	< 2	0.004	0.0040	0.05	< 0.00003	< 0.001	0.0017	0.19	< 0.0002	---	0.0039	0.013	0.0006	< 0.0001	< 0.0002	0.0024	0.006
	19-Aug-2011	10	---	0.034	0.003	< 2	< 0.01	< 0.002	0.05	< 0.00005	**< 0.01** [#1]	0.003	**0.37** [#1]	< 0.002	---	0.007	0.011	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.002	< 0.03
	19-Aug-2012	5.1	---	< 0.0030	< 0.0030	3.1	0.0050	**0.013** [#1]	0.047	< 0.000025	< 0.0010	0.00047	**1.6** [#1]	0.00030	---	0.0072	0.0073	0.00083	< 0.00010	< 0.00020	0.0016	< 0.0030
	01-Aug-2014	---	---	---	---	---	0.0074	**0.0081** [#1]	0.038	< 0.000020	< 0.0010	0.00051	**18** [#1]	< 0.00020	---	0.0065	0.0063	0.00063	< 0.00010	< 0.00020	0.00040	0.0044
B38 08-4-4	19-Aug-2008	27	7.5	0.003	< 0.003	**110** [#1]	0.013	0.004	0.06	**0.00009** [#1]	0.001	**0.011** [#1]	0.07	< 0.0002	---	0.015	0.017	< 0.001	< 0.0001	< 0.0002	0.0066	**0.11** [#1]
B38 93-1-2	09-Sep-1998	7	7.5	0.05	0.033	**17** [#1]	< 0.02	**< 0.04** [#1]	0.03	**< 0.002** [#1]	< 0.002	0.003	< 0.003	**< 0.02** [#1]	**< 0.00005** [#1]	< 0.004	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
	15-Sep-1999	7.0	7.8	0.02	0.006	**5** [#1]	0.02	0.002	0.047	**0.0005** [#1]	0.004	< 0.001	**0.803** [#1]	< 0.001	**< 0.00005** [#1]	0.007	0.011	**0.001** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	17-Sep-2000	9.6	6.9	< 0.02	< 0.005	**11** [#1]	< 0.02	0.001	0.039	**0.0003** [#1]	< 0.005	**< 0.005** [#1]	0.036	< 0.001	**< 0.00005** [#1]	< 0.005	0.014	< 0.001	< 0.0001	**< 0.03** [#1]	---	< 0.005
	26-Aug-2001	9.4	7.0	0.07	0.032	3	< 0.02	**< 0.05** [#1]	0.049	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**0.326** [#1]	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
B38 93-11-2	09-Sep-1998	119	7.2	< 0.02	0.04	**1000** [#1]	< 0.02	**< 0.04** [#1]	0.021	**< 0.002** [#1]	0.002	< 0.001	**0.913** [#1]	**< 0.02** [#1]	---	< 0.004	0.018	**0.04** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	0.02
B38 93-13-6	07-Sep-1997	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Oct-1998	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2000	27	7.7	< 0.02	< 0.005	---	< 0.02	**< 0.05** [#1]	0.074	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.154	**0.08** [#1]	---	< 0.005	0.010	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	**0.064** [#1]
	26-Aug-2001	26.7	7.6	< 0.02	0.008	**275** [#1]	**0.21** [#1]	**< 0.05** [#1]	0.087	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**0.974** [#1]	**0.04** [#1]	---	< 0.005	0.010	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	0.009
B38 93-2-4	07-Sep-1997	15.5	7.9	0.11	0.022	---	0.08	< 0.0005	0.076	**< 0.002** [#1]	0.004	0.003	0.053	0.001	**< 0.00005** [#1]	< 0.004	0.014	< 0.0005	**< 0.01** [#1]	**< 0.02** [#1]	---	0.012
	09-Sep-1998	14.7	7.7	0.16	< 0.005	3	< 0.02	**0.07** [#1]	0.055	**< 0.002** [#1]	< 0.002	< 0.001	0.017	**< 0.02** [#1]	---	< 0.004	0.009	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
	15-Sep-1999	11	8.1	0.04	0.014	---	0.02	0.002	0.062	**0.0002** [#1]	0.004	< 0.001	**0.588** [#1]	0.002	**< 0.00005** [#1]	< 0.004	0.013	**0.002** [#1]	< 0.0001	**< 0.02** [#1]	---	0.003
	18-Oct-1999	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	7.7	6.9	0.10	0.008	**6** [#1]	< 0.02	0.001	0.051	**0.0002** [#1]	< 0.005	**< 0.005** [#1]	0.009	< 0.001	**< 0.00005** [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	**< 0.03** [#1]	---	0.008
(Duplicate)	17-Sep-2000	8.0	6.9	0.08	0.012	**5** [#1]	< 0.02	0.001	0.047	**0.0001** [#1]	< 0.005	**< 0.005** [#1]	0.020	0.002	**< 0.00005** [#1]	< 0.005	< 0.008	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	0.006
	26-Aug-2001	6.8	7.1	0.08	< 0.005	3	< 0.02	**< 0.05** [#1]	0.059	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.006	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	0.008
	20-Aug-2002	9.9	7.6	0.06	< 0.005	---	0.018	< 0.001	0.048	**0.00021** [#1]	< 0.001	**0.0047** [#1]	0.055	< 0.0005	**< 0.00005** [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	0.00692	**0.042** [#1]
	25-Aug-2003	7	6.7	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	0.044	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	0.011
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 93-20-7	19-Dec-2000	42.9	7.18	< 0.003	< 0.003	---	---	---	---	---	---	---	**3.61** [#1]	---	---	---	---	---	---	---	---	---
	27-Aug-2001	38.2	8.1	< 0.02	< 0.005	**194** [#1]	< 0.02	**< 0.05** [#1]	0.117	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**1.72** [#1]	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	25-Aug-2003	54	7.1	1.1	< 0.06	---	---	**0.016** [#1]	0.120	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**9.402** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.001** [#1]	---	---	**< 1.0** [#1]	0.009
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2005	51.1	---	< 0.2	< 0.06	**101** [#1]	< 0.005	**0.0316** [#1]	0.16	**0.00010** [#1]	< 0.007	0.003	0.113	0.001	**< 0.00005** [#1]	0.021	0.011	**0.0120** [#1]	< 0.0001	< 0.0008	0.002	< 0.005
	21-Aug-2006	45	---	< 0.2	< 0.06	**61** [#1]	---	**0.019** [#1]	0.16	0.00002	< 0.007	< 0.002	**10.3** [#1]	0.001	**< 0.00005** [#1]	< 0.006	0.044	**0.005** [#1]	< 0.0001	---	< 0.001	< 0.005
	23-Aug-2006	---	---	---	---	---	< 0.005	**0.019** [#1]	---	0.00002	---	< 0.002	---	0.001	---	---	---	**0.005** [#1]	< 0.0001	< 0.0008	< 0.001	---
	20-Aug-2007	40	---	< 0.2	< 0.06	**14** [#1]	0.003	**0.043** [#1]	0.20	< 0.00001	0.002	0.0026	0.22	0.0069	---	0.0313	0.0042	**0.011** [#1]	< 0.0001	< 0.0002	0.0034	0.013
	19-Aug-2008	38	---	< 0.003	< 0.003	**31** [#1]	< 0.001	**0.011** [#1]	0.16	< 0.00001	< 0.001	**0.0057** [#1]	**2.3** [#1]	**0.0075** [#1]	---	0.0006	0.0041	< 0.001	< 0.0001	< 0.0002	0.0009	0.017
	19-Aug-2009	41	7.49	0.008	< 0.003	**14** [#1]	0.001	**0.039** [#1]	0.14	0.000014	< 0.001	0.0026	**5.7** [#1]	0.0050	---	0.0033	0.014	**0.0025** [#1]	< 0.0001	< 0.0002	0.0071	0.009
	10-Sep-2016	20	7.54	< 0.010	< 0.010	**15** [#1]	0.0039	**0.0054** [#1]	0.17	< 0.000020	< 0.0010	< 0.00020	**2.3** [#1]	0.00021	---	0.0010	0.023	0.00091	< 0.00010	< 0.00020	0.00082	0.0046

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38 97-9-5	09-Sep-1998	**291** [#1]	6.8	0.04	0.005	**1960** [#1]	< 0.02	**< 0.04** [#1]	0.02	**< 0.002** [#1]	0.004	0.003	0.246	**0.27** [#1]	---	< 0.004	0.031	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
	21-Oct-1998	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	---	---	---	---	---	< 0.02	**0.021** [#1]	0.023	**< 0.002** [#1]	0.004	0.003	**0.878** [#1]	**0.440** [#1]	---	< 0.004	0.036	**0.020** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	0.002
	17-Sep-2000	**270** [#1]	7.2	0.07	0.011	**3190** [#1]	0.05	< 0.001	0.018	**< 0.0001** [#1]	< 0.005	**0.014** [#1]	0.083	**0.754** [#1]	**< 0.00005** [#1]	< 0.005	0.027	**0.063** [#1]	< 0.0001	**< 0.03** [#1]	---	**0.032** [#1]
	25-Aug-2003	**122** [#1]	7.1	< 0.2	**0.08** [#1]	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	0.032	**0.90** [#1]	**< 0.00005** [#1]	---	---	**0.024** [#1]	---	---	**< 1.0** [#1]	**0.063** [#1]
B38 98-19-5	09-Sep-1998	29	8.2	< 0.02	0.024	**76** [#1]	0.02	0.004	0.112	**< 0.0001** [#1]	0.007	**0.004** [#1]	**0.479** [#1]	< 0.001	**< 0.00005** [#1]	< 0.004	< 0.008	**0.001** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
(Duplicate)	09-Sep-1998	29	8.2	< 0.02	0.036	**70** [#1]	< 0.02	**0.007** [#1]	0.113	**< 0.0001** [#1]	0.005	0.002	**0.477** [#1]	< 0.001	**< 0.00005** [#1]	< 0.004	< 0.008	**0.001** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	15-Sep-1999	32	8.3	< 0.02	< 0.005	---	< 0.02	**0.025** [#1]	0.100	**< 0.0001** [#1]	0.003	< 0.001	**10.5** [#1]	< 0.001	**< 0.00005** [#1]	0.006	< 0.008	< 0.001	< 0.0001	**< 0.02** [#1]	---	< 0.002
	18-Oct-1999	---	---	---	---	**40** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	32	7.3	< 0.02	< 0.005	**336** [#1]	< 0.02	0.003	0.094	**< 0.0001** [#1]	< 0.005	**< 0.005** [#1]	**0.494** [#1]	**0.007** [#1]	**< 0.00005** [#1]	< 0.005	< 0.008	**0.007** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
	27-Aug-2001	38.7	8.0	< 0.02	< 0.005	**312** [#1]	0.07	**< 0.05** [#1]	0.121	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**5.02** [#1]	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	25-Aug-2003	41	7.0	0.7	< 0.06	---	---	**0.011** [#1]	0.130	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**7.796** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.002** [#1]	---	---	**< 1.0** [#1]	< 0.005
	23-Aug-2004	39	---	< 0.2	< 0.06	---	< 0.010	**0.013** [#1]	0.163	< 0.000034	< 0.005	**0.006** [#1]	**13.83** [#1]	< 0.002	**< 0.00005** [#1]	< 0.005	< 0.008	**0.008** [#1]	**< 0.0002** [#1]	**< 0.0016** [#1]	0.004	< 0.005
	24-Aug-2005	39.5	---	< 0.2	< 0.06	**82** [#1]	< 0.005	**0.0402** [#1]	0.16	0.00002	< 0.007	0.003	0.157	< 0.001	**0.00005** [#1]	< 0.006	0.014	**0.01** [#1]	< 0.0001	< 0.0008	0.003	< 0.005
	21-Aug-2006	36	---	< 0.2	< 0.06	**79** [#1]	---	**0.022** [#1]	0.16	0.00005	< 0.007	< 0.002	**6.12** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.015	**0.006** [#1]	< 0.0001	---	0.014	< 0.005
(Duplicate)	21-Aug-2006	---	---	---	---	**82** [#1]	---	**0.033** [#1]	0.15	< 0.00001	< 0.007	< 0.002	**7.07** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.012	**0.008** [#1]	< 0.0001	---	0.013	< 0.005
	23-Aug-2006	---	---	---	---	---	< 0.005	**0.022** [#1]	---	0.00005	---	< 0.002	---	< 0.001	---	---	---	**0.006** [#1]	< 0.0001	< 0.0008	0.014	---
	10-Sep-2016	---	---	---	---	**35** [#1]	< 0.0030	0.0035	0.17	**0.00010** [#1]	< 0.0010	< 0.00020	**13** [#1]	< 0.00020	---	0.00028	0.0022	**0.0013** [#1]	< 0.00010	< 0.00020	0.0022	< 0.0030
B38 98-21-18	25-Aug-2003	23	7.0	0.7	< 0.06	---	---	< 0.005	0.128	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**9.734** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.005** [#1]	---	---	**< 1.0** [#1]	0.007
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 98-22-3	09-Sep-1998	33	7.8	0.13	0.038	**8** [#1]	0.05	0.003	0.078	**0.0002** [#1]	0.004	0.002	0.275	< 0.001	**< 0.00005** [#1]	0.013	0.024	**0.007** [#1]	< 0.0001	**< 0.02** [#1]	---	**0.039** [#1]
	15-Sep-1999	39	8.1	< 0.02	< 0.005	**4** [#1]	0.02	0.002	0.091	**0.0001** [#1]	0.004	< 0.001	**0.656** [#1]	< 0.001	**< 0.00005** [#1]	0.016	0.026	**0.002** [#1]	< 0.0001	**< 0.02** [#1]	---	**0.072** [#1]
	17-Sep-2000	29	7.2	< 0.02	< 0.005	**10** [#1]	< 0.02	< 0.001	0.071	**0.0002** [#1]	< 0.005	**< 0.005** [#1]	0.008	< 0.001	**< 0.00005** [#1]	0.009	0.012	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	**0.085** [#1]
	26-Aug-2001	29.2	7.8	0.77	0.043	2	< 0.02	**< 0.05** [#1]	0.062	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.028	**< 0.03** [#1]	---	0.023	0.010	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	**0.040** [#1]
	20-Aug-2002	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	17	7.1	< 0.2	< 0.06	---	---	< 0.005	0.090	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	0.026	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.009** [#1]	---	---	**< 1.0** [#1]	**0.060** [#1]
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	27	7.28	0.055	< 0.003	3	0.003	0.0003	0.08	**0.00049** [#1]	< 0.001	**0.0059** [#1]	< 0.06	< 0.0002	---	0.014	0.021	0.0008	< 0.0001	0.0002	**0.016** [#1]	**0.077** [#1]
B38 98-6-5	09-Sep-1998	**160** [#1]	8.0	< 0.02	0.006	**56** [#1]	0.03	0.004	0.033	**< 0.0001** [#1]	0.006	0.003	**3.14** [#1]	< 0.001	**< 0.00005** [#1]	< 0.004	< 0.008	**0.001** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	15-Sep-1999	**130** [#1]	8.1	0.02	< 0.005	**69** [#1]	0.02	**0.007** [#1]	0.030	**< 0.0001** [#1]	0.003	< 0.001	**8.95** [#1]	< 0.001	**< 0.00005** [#1]	0.006	< 0.008	**0.002** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	17-Sep-2000	**150** [#1]	6.9	< 0.02	< 0.005	**179** [#1]	< 0.02	0.003	0.019	**< 0.0001** [#1]	< 0.005	**< 0.005** [#1]	**0.717** [#1]	< 0.001	**< 0.00005** [#1]	< 0.005	0.011	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
	26-Aug-2001	**123** [#1]	7.6	< 0.02	< 0.005	**167** [#1]	< 0.02	**< 0.05** [#1]	0.031	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.212	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	20-Aug-2002	96.6	7.7	< 0.02	< 0.005	---	0.033	**0.021** [#1]	0.030	< 0.00001	< 0.001	0.0009	**34.3** [#1]	< 0.0005	**< 0.00005** [#1]	< 0.005	0.011	**0.002** [#1]	< 0.0001	< 0.0001	0.00462	0.021
	24-Aug-2003	106	6.8	< 0.2	< 0.06	---	---	**0.025** [#1]	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**39.52** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	< 0.005

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38 98-7-3	09-Sep-1998	103	8.0	1.26	0.019	**7 [#1]**	< 0.02	**< 0.04 [#1]**	0.060	**< 0.002 [#1]**	0.002	0.002	0.013	**< 0.02 [#1]**	---	< 0.004	0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	< 0.002
	21-Oct-1998	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	95	8.0	< 0.02	< 0.005	---	0.03	0.001	0.052	**0.0003 [#1]**	0.004	0.002	0.051	< 0.001	**< 0.00005 [#1]**	0.006	0.010	**0.001 [#1]**	< 0.0001	**< 0.02 [#1]**	---	0.011
	17-Sep-2000	**140 [#1]**	7.1	< 0.02	< 0.005	**13 [#1]**	< 0.02	< 0.001	0.050	**0.0004 [#1]**	< 0.005	**< 0.005 [#1]**	0.006	< 0.001	**< 0.00005 [#1]**	< 0.005	0.013	< 0.001	< 0.0001	**< 0.03 [#1]**	---	0.010
	26-Aug-2001	**148 [#1]**	7.7	< 0.02	< 0.005	**4 [#1]**	0.02	**< 0.05 [#1]**	0.079	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.015	**< 0.03 [#1]**	---	< 0.005	0.011	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	0.005
	20-Aug-2002	**144 [#1]**	7.7	< 0.02	< 0.005	---	0.093	< 0.001	0.046	**0.00035 [#1]**	< 0.001	**0.0070 [#1]**	0.238	< 0.0005	**< 0.00005 [#1]**	< 0.005	0.013	**0.002 [#1]**	< 0.0001	< 0.0001	0.0144	0.016
(Duplicate)	20-Aug-2002	**164 [#1]**	7.5	< 0.02	< 0.005	**10 [#1]**	0.054	< 0.001	0.048	**0.00039 [#1]**	< 0.001	**0.0073 [#1]**	0.106	< 0.0005	**< 0.00005 [#1]**	< 0.005	0.011	< 0.001	< 0.0001	< 0.0001	0.0129	0.021
	25-Aug-2003	**192 [#1]**	6.7	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	0.040	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	0.015
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 98-8-4	09-Sep-1998	27	7.9	< 0.02	0.012	**276 [#1]**	0.03	**0.007 [#1]**	0.074	**< 0.0001 [#1]**	0.004	< 0.001	**3.10 [#1]**	< 0.001	**< 0.00005 [#1]**	< 0.004	0.017	**0.002 [#1]**	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	27-Sep-2000	27	7.4	< 0.02	0.006	---	< 0.02	**0.05 [#1]**	0.041	**< 0.002 [#1]**	0.005	**< 0.005 [#1]**	0.214	**< 0.03 [#1]**	---	< 0.005	0.027	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2001	28.9	7.3	< 0.02	< 0.005	**1740 [#1]**	**0.12 [#1]**	**< 0.05 [#1]**	0.099	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.713 [#1]**	**< 0.03 [#1]**	---	< 0.005	0.014	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	20-Aug-2002	25.6	6.9	< 0.02	< 0.005	---	**0.183 [#1]**	**0.009 [#1]**	0.072	0.00002	< 0.001	0.0022	**4.97 [#1]**	0.0016	**0.00073 [#1]**	< 0.005	0.023	**0.004 [#1]**	< 0.0001	< 0.0001	0.00637	0.021
	25-Aug-2003	27	6.9	< 0.2	< 0.06	---	---	**0.006 [#1]**	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**10.86 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.003 [#1]**	---	---	**< 1.0 [#1]**	0.005
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-14-4	27-Sep-2000	28	7.7	< 0.02	0.005	---	< 0.02	**0.08 [#1]**	0.083	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.770 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	26-Aug-2001	59.6	7.6	< 0.02	0.007	**1090 [#1]**	**0.19 [#1]**	**< 0.05 [#1]**	0.114	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**1.68 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	20-Aug-2002	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-15-4	27-Sep-2000	78	7.0	< 0.02	0.006	---	0.03	**< 0.05 [#1]**	0.034	**0.002 [#1]**	0.005	**0.006 [#1]**	**0.620 [#1]**	**< 0.03 [#1]**	---	< 0.005	0.017	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	**0.045 [#1]**
	27-Aug-2001	61.3	7.4	< 0.02	< 0.005	**13 [#1]**	0.04	**< 0.05 [#1]**	0.037	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**12.6 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	20-Aug-2002	66.7	6.8	< 0.02	0.006	---	**0.272 [#1]**	**0.005 [#1]**	0.043	**< 0.00010 [#1]**	< 0.001	0.0021	**13.4 [#1]**	**0.0130 [#1]**	**0.00082 [#1]**	< 0.005	0.017	**0.005 [#1]**	< 0.0001	< 0.0001	0.00972	0.019
	25-Aug-2003	66	6.8	< 0.2	< 0.06	---	---	**0.005 [#1]**	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**27.12 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.002 [#1]**	---	---	**< 1.0 [#1]**	0.007
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-4-30	25-Aug-2003	8	7.1	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	0.022	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.003 [#1]**	---	---	**< 1.0 [#1]**	< 0.005
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-5-6	16-Sep-1999	2.7	8.3	< 0.02	< 0.005	**43 [#1]**	0.03	**0.010 [#1]**	0.073	**< 0.0001 [#1]**	0.002	< 0.001	**3.60 [#1]**	< 0.001	**< 0.00005 [#1]**	0.007	0.008	**0.002 [#1]**	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	24-Aug-2003	2	6.9	< 0.2	< 0.06	---	---	**0.012 [#1]**	0.075	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**11.07 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.001 [#1]**	---	---	**< 1.0 [#1]**	< 0.005
(Duplicate)	24-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 DP02 SUMP	10-Sep-2002	11.0	8.0	< 0.02	0.024	---	0.03	**< 0.05 [#1]**	0.014	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**1.51 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
(Duplicate)	10-Sep-2002	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 DP99-1	18-Sep-1999	**670 [#1]**	6.9	0.02	0.007	---	0.03	0.002	0.106	**0.0005 [#1]**	0.008	0.003	0.027	< 0.001	**< 0.00005 [#1]**	< 0.004	0.023	< 0.001	< 0.0001	**< 0.02 [#1]**	---	0.005
	17-Sep-2000	**120 [#1]**	7.3	< 0.02	< 0.005	**6 [#1]**	0.03	0.001	0.052	**0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	0.035	< 0.001	**< 0.00005 [#1]**	< 0.005	0.009	**0.001 [#1]**	< 0.0001	**< 0.03 [#1]**	---	0.005
B38 MP00-2	21-Sep-2000	---	---	---	---	**34 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 MP00-3	21-Sep-2000	---	---	---	---	**15 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38 MP00-4	21-Sep-2000	---	---	---	---	**14 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38 SW01	20-Aug-2009	9	7.73	0.016	< 0.003	< 2	---	---	---	---	---	---	**0.75** [#1]	---	---	---	---	---	---	---	---	---
	22-Aug-2010	10	7.87	< 0.003	< 0.003	**10** [#1]	---	---	---	---	---	---	0.14	---	---	---	---	---	---	---	---	---
	18-Aug-2011	7	7.72	< 0.003	< 0.003	**4** [#1]	---	---	---	---	---	---	**2.4** [#1]	---	---	---	---	---	---	---	---	---
	19-Aug-2012	6.8	7.28	< 0.0030	< 0.0030	2.2	---	---	---	---	---	---	**1.8** [#1]	---	---	---	---	---	---	---	---	---
B38-10-2-5	30-Sep-2010	7	7.19	0.015	< 0.003	**8** [#1]	0.001	**0.0079** [#1]	0.10	< 0.00003	0.001	0.0007	**1.6** [#1]	< 0.0002	---	0.0054	0.024	0.0009	< 0.0001	< 0.0002	0.0013	0.006
(Duplicate)	30-Sep-2010	---	---	---	---	**9** [#1]	0.001	**0.0083** [#1]	0.10	< 0.00003	< 0.001	0.0010	**1.6** [#1]	< 0.0002	---	0.0056	0.025	**0.0010** [#1]	< 0.0001	< 0.0002	0.0014	0.006
	19-Aug-2011	7	7.72	< 0.03	< 0.03	< 2	< 0.01	**0.015** [#1]	0.11	< 0.00005	**< 0.01** [#1]	< 0.002	**3.3** [#1]	< 0.002	---	0.005	0.021	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.001	< 0.03
(Duplicate)	19-Aug-2011	---	---	---	---	**6** [#1]	< 0.01	**0.015** [#1]	0.11	< 0.00005	**< 0.01** [#1]	< 0.002	**3.1** [#1]	< 0.002	---	0.005	0.019	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.001	< 0.03
	19-Aug-2012	6.8	7.34	0.013	< 0.0030	**7.9** [#1]	0.0094	**0.023** [#1]	0.10	< 0.000025	0.0016	0.0018	**16** [#1]	< 0.00020	---	0.0039	0.013	0.00089	< 0.00010	< 0.00020	0.00045	0.0051
(Duplicate)	19-Aug-2012	---	---	---	---	**8.0** [#1]	0.0090	**0.022** [#1]	0.10	< 0.000025	0.0016	0.0020	**16** [#1]	< 0.00020	---	0.0036	0.014	0.00088	< 0.00010	< 0.00020	0.00047	0.0076
B38-10-2-5	25-Aug-2013	7.0	---	< 0.0030	< 0.0030	**16** [#1]	0.011	**0.019** [#1]	0.10	0.000025	0.0014	0.00030	**13** [#1]	< 0.00020	---	0.00084	0.0063	0.00079	< 0.00010	< 0.00020	0.00020	0.0039
(Duplicate)	25-Aug-2013	7.1	---	< 0.0030	0.0030	**17** [#1]	0.011	**0.018** [#1]	0.097	< 0.000025	0.0014	< 0.00020	**13** [#1]	< 0.00020	---	0.00085	0.0060	0.00075	< 0.00010	< 0.00020	0.00021	0.0031
	01-Aug-2014	7.6	---	< 0.010	< 0.010	**8.1** [#1]	0.011	**0.014** [#1]	0.089	< 0.000020	0.0012	0.00031	**11** [#1]	< 0.00020	---	0.00048	0.0052	0.00069	< 0.00010	< 0.00020	< 0.00010	0.0050
(Duplicate)	01-Aug-2014	7.7	---	< 0.010	< 0.010	**10** [#1]	0.019	**0.014** [#1]	0.090	< 0.000020	0.0011	0.00067	**11** [#1]	< 0.00020	---	0.00052	0.0032	0.00058	< 0.00010	< 0.00020	< 0.00010	0.0036
	10-Aug-2015	---	---	---	---	---	0.014	**0.023** [#1]	0.11	< 0.000020	0.0016	0.00054	**18** [#1]	< 0.00020	---	0.00088	0.0048	0.00077	< 0.00010	< 0.00020	< 0.00010	0.0077
(Duplicate)	10-Aug-2015	---	---	---	---	---	0.014	**0.024** [#1]	0.11	< 0.000020	0.0015	0.00044	**17** [#1]	< 0.00020	---	0.00090	0.0049	0.00074	< 0.00010	< 0.00020	< 0.00010	0.0045
	04-Aug-2016	---	---	---	---	---	0.010	**0.019** [#1]	0.091	0.000025	0.0013	0.00043	**13** [#1]	0.00024	---	0.00063	0.0038	0.00075	< 0.00010	< 0.00020	0.00013	0.0095
(Duplicate)	04-Aug-2016	---	---	---	---	---	0.010	**0.019** [#1]	0.090	0.000026	0.0014	0.00066	**13** [#1]	0.00023	---	0.00064	0.0040	0.00079	< 0.00010	< 0.00020	0.00012	0.014
	18-Aug-2017	---	---	---	---	---	0.0079	**0.015** [#1]	0.090	< 0.000020	0.0012	0.00085	**13** [#1]	< 0.00020	---	0.00037	0.0023	0.00081	< 0.00010	< 0.00020	< 0.00010	0.0093
(Duplicate)	18-Aug-2017	---	---	---	---	---	0.0076	**0.015** [#1]	0.088	< 0.000020	0.0012	< 0.00020	**13** [#1]	< 0.00020	---	0.00040	0.0023	0.00095	< 0.00010	< 0.00020	< 0.00010	0.0075
B38-10-1-5	30-Sep-2010	4	7.12	0.006	< 0.003	3	0.012	**0.017** [#1]	0.09	< 0.00003	0.001	0.0006	**8.2** [#1]	< 0.0002	---	0.0044	0.014	0.0007	< 0.0001	< 0.0002	0.0007	0.005
	19-Aug-2011	4	7.84	< 0.003	0.010	< 2	< 0.01	**0.031** [#1]	0.09	< 0.00005	**< 0.01** [#1]	< 0.002	**14** [#1]	< 0.002	---	< 0.002	0.007	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	< 0.001	< 0.03
(Duplicate)	19-Aug-2011	---	---	---	---	< 2	< 0.01	**0.033** [#1]	0.09	< 0.00005	**< 0.01** [#1]	< 0.002	**14** [#1]	< 0.002	---	< 0.002	0.008	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	< 0.001	< 0.03
	19-Aug-2012	4.3	7.57	< 0.0030	< 0.0030	**7.9** [#1]	0.0042	**0.032** [#1]	0.10	< 0.000025	0.0012	0.00074	**14** [#1]	< 0.00020	---	0.0020	0.0050	**0.0010** [#1]	< 0.00010	< 0.00020	0.00019	0.0040
(Duplicate)	19-Aug-2012	---	---	---	---	**9.0** [#1]	0.0053	**0.032** [#1]	0.098	< 0.000025	0.0012	0.0021	**14** [#1]	< 0.00020	---	0.0018	0.0052	0.00098	< 0.00010	< 0.00020	0.00017	0.0049
B38-10-1-5	25-Aug-2013	4.0	---	< 0.0030	< 0.0030	**11** [#1]	0.0065	**0.040** [#1]	0.097	< 0.000025	0.0011	< 0.00020	**16** [#1]	< 0.00020	---	0.0015	0.0039	0.00095	< 0.00010	< 0.00020	0.00016	< 0.0030
(Duplicate)	25-Aug-2013	4.0	---	< 0.0030	0.0062	**13** [#1]	0.0083	**0.039** [#1]	0.097	< 0.000025	0.0011	0.00069	**16** [#1]	< 0.00020	---	0.0014	0.0038	0.00092	< 0.00010	< 0.00020	0.00016	< 0.0030
	01-Aug-2014	4.4	---	< 0.010	< 0.010	**14** [#1]	0.0091	**0.064** [#1]	0.086	< 0.000020	0.0011	0.00030	**25** [#1]	< 0.00020	---	0.0024	0.0047	**0.0010** [#1]	< 0.00010	< 0.00020	0.00012	0.0036
(Duplicate)	01-Aug-2014	3.4	---	< 0.010	0.020	**11** [#1]	0.0091	**0.065** [#1]	0.084	< 0.000020	0.0010	0.00023	**25** [#1]	< 0.00020	---	0.0023	0.0039	0.00087	< 0.00010	< 0.00020	0.00015	< 0.0030
	10-Aug-2015	---	---	---	---	**7.1** [#1]	0.016	**0.099** [#1]	0.086	< 0.000020	0.0012	0.00098	**41** [#1]	< 0.00020	---	0.0024	0.0043	0.00094	< 0.00010	< 0.00020	0.00027	0.011
(Duplicate)	10-Aug-2015	---	---	---	---	**10** [#1]	0.014	**0.099** [#1]	0.086	< 0.000020	0.0012	0.00040	**42** [#1]	< 0.00020	---	0.0024	0.0042	0.00085	< 0.00010	< 0.00020	0.00014	0.0056
	04-Aug-2016	---	---	---	---	---	0.010	**0.081** [#1]	0.076	< 0.000020	0.0011	0.00039	**25** [#1]	< 0.00020	---	0.0017	0.0026	0.00077	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	04-Aug-2016	---	---	---	---	---	0.011	**0.082** [#1]	0.075	< 0.000020	0.0012	0.00039	**25** [#1]	0.00025	---	0.0016	0.0028	0.00084	< 0.00010	< 0.00020	0.00010	0.0063
	18-Aug-2017	---	---	---	---	---	0.010	**0.068** [#1]	0.074	< 0.000020	0.0012	0.0013	**28** [#1]	< 0.00020	---	0.0023	0.010	0.00096	< 0.00010	< 0.00020	0.00097	0.0093

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38-N-OBS-59	06-Jul-2016	4.3	7.08	< 0.010	< 0.010	**82 [#1]**	0.055	**0.0068 [#1]**	< 0.020	0.000044	< 0.0010	0.00074	**40 [#1]**	0.00068	---	0.016	0.0072	**0.0018 [#1]**	< 0.00010	< 0.00020	0.0037	< 0.0030
B38-N-OBS-61	06-Jul-2016	15	7.11	< 0.010	0.011	**100 [#1]**	0.0069	**0.0058 [#1]**	0.021	**0.00021 [#1]**	< 0.0010	< 0.00020	**37 [#1]**	0.0020	---	0.00065	0.0048	**0.0013 [#1]**	< 0.00010	< 0.00020	0.00017	0.0090
B38-N-OBS-62	19-Aug-2012	30	7.44	0.0034	0.0047	**99 [#1]**	0.0055	**0.0060 [#1]**	0.044	0.000030	< 0.0010	0.00038	**12 [#1]**	< 0.00020	---	0.029	0.015	**0.0011 [#1]**	< 0.00010	< 0.00020	0.0082	0.0051
	06-Jul-2016	9.9	7.34	0.074	< 0.010	< 4.0	0.0042	0.0020	0.034	**0.00010 [#1]**	0.0017	0.00070	**2.4 [#1]**	< 0.00020	---	**0.079 [#1]**	0.058	**0.0011 [#1]**	< 0.00010	0.00074	**0.032 [#1]**	**0.032 [#1]**
B38-16-1-3	12-Aug-2017	8.0	---	< 0.010	< 0.010	**18 [#1]**	0.011	**0.0080 [#1]**	0.061	0.000039	< 0.0010	0.0018	**19 [#1]**	0.00025	---	0.0026	0.013	0.00049	< 0.00010	< 0.00020	0.0018	0.012
B38-N-INLET	02-Sep-2007	53	7.9	< 0.2	< 0.06	---	---	---	---	---	---	---	**1.22 [#1]**	---	---	---	---	---	---	---	---	---
	22-Sep-2008	33	7.3	0.041	< 0.003	---	---	---	---	---	---	---	0.07	---	---	---	---	---	---	---	---	---
	13-Aug-2009	24	6.92	0.005	< 0.003	---	---	---	---	---	---	---	**1.5 [#1]**	---	---	---	---	---	---	---	---	---
	27-Jun-2010	24	7.10	0.003	< 0.003	---	---	---	---	---	---	---	0.13	---	---	---	---	---	---	---	---	---
	20-Aug-2011	38	7.17	< 0.03	< 0.03	---	---	---	---	---	---	---	**22 [#1]**	---	---	---	---	---	---	---	---	---
B38-N-INLET	26-Sep-2012	63	6.97	0.015	< 0.0030	---	---	---	---	---	---	---	**27 [#1]**	---	---	---	---	---	---	---	---	---
	22-Sep-2013	26	7.50	0.0069	< 0.0030	---	---	---	---	---	---	---	**20 [#1]**	---	---	---	---	---	---	---	---	---
	19-Sep-2014	26	6.96	< 0.010	< 0.010	---	0.010	**0.0088 [#1]**	0.040	0.000049	0.0010	0.00032	**68 [#1]**	< 0.00020	---	**0.12 [#1]**	0.016	**0.0018 [#1]**	< 0.00010	< 0.00020	**0.040 [#1]**	< 0.0030
	20-Aug-2015	18	7.34	< 0.010	< 0.010	---	0.026	**0.0099 [#1]**	< 0.020	0.000032	< 0.0010	0.00043	**76 [#1]**	< 0.00020	---	0.036	0.037	**0.0024 [#1]**	< 0.00010	< 0.00020	**0.060 [#1]**	< 0.0030
	06-Jul-2016	18	7.05	< 0.010	< 0.010	**130 [#1]**	0.017	**0.0086 [#1]**	< 0.020	< 0.000020	< 0.0010	< 0.00020	**82 [#1]**	0.00050	---	0.024	0.020	**0.0017 [#1]**	< 0.00010	< 0.00020	0.013	0.010
B38-S-INLET	17-Sep-2004	53	6.9	< 0.2	< 0.06	---	---	---	---	---	---	---	**107.8 [#1]**	---	---	---	---	---	---	---	---	---
	21-Aug-2005	10.7	7.0	< 0.2	< 0.06	---	---	---	---	---	---	---	**45.0 [#1]**	---	---	---	---	---	---	---	---	---
	13-Aug-2009	38	6.90	0.005	< 0.003	---	---	---	---	---	---	---	**1.3 [#1]**	---	---	---	---	---	---	---	---	---
	27-Jun-2010	100	6.88	0.005	< 0.003	---	---	---	---	---	---	---	**9.2 [#1]**	---	---	---	---	---	---	---	---	---
B38X-EW1	28-Jul-1999	40	7.6	---	---	---	0.05	**< 0.04 [#1]**	0.121	**< 0.002 [#1]**	0.002	**0.006 [#1]**	0.156	**0.04 [#1]**	---	< 0.004	0.012	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	0.006
B38X-N-OBS26	01-Oct-2001	74.8	7.2	< 0.02	0.009	---	< 0.02	**< 0.05 [#1]**	0.026	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.356 [#1]**	**< 0.03 [#1]**	---	< 0.005	0.014	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	**0.033 [#1]**
B38X-N-OBS7	01-Oct-2001	**189 [#1]**	6.9	< 0.02	0.005	---	< 0.02	**< 0.05 [#1]**	0.016	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.194	**< 0.03 [#1]**	---	0.005	0.037	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	0.027
B38X-N-TR4	01-Oct-2001	87.4	7.2	< 0.02	0.008	---	0.04	**< 0.05 [#1]**	0.023	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.149	**< 0.03 [#1]**	---	0.041	**0.281 [#1]**	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	**0.090 [#1]**
B38X-OBS1	03-Aug-2000	33	7.9	< 0.02	0.005	---	**0.17 [#1]**	**< 0.05 [#1]**	0.167	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**1.13 [#1]**	**< 0.03 [#1]**	---	0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
B38X-OBS10	03-Aug-2000	46	7.9	< 0.02	< 0.005	---	0.04	**< 0.05 [#1]**	0.116	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.523 [#1]**	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	0.010
B38X-OBS11	03-Aug-2000	47	8.1	< 0.02	< 0.005	---	0.03	**< 0.05 [#1]**	0.089	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.093	**< 0.03 [#1]**	---	< 0.005	0.009	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	0.013
B38X-OBS12	23-Aug-2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS2	28-Jul-1999	41	8.1	---	---	---	< 0.02	**0.09 [#1]**	0.111	**< 0.002 [#1]**	< 0.002	0.002	0.150	**< 0.02 [#1]**	---	< 0.004	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	< 0.002
B38X-OBS4	28-Jul-1999	39	7.7	---	---	---	**1.42 [#1]**	**0.05 [#1]**	0.139	**< 0.002 [#1]**	0.002	**0.005 [#1]**	**3.75 [#1]**	**< 0.02 [#1]**	---	< 0.004	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	0.015
B38X-OBS5	28-Jul-1999	28	7.8	---	---	---	0.03	**< 0.04 [#1]**	0.166	**< 0.002 [#1]**	0.002	0.002	0.201	**< 0.02 [#1]**	---	< 0.004	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.02 [#1]**	---	0.010
B38X-OBS6	28-Jul-1999	23	8.1	---	---	---	0.09	**< 0.04 [#1]**	0.052	**< 0.002 [#1]**	< 0.002	< 0.001	**0.412 [#1]**	**< 0.02 [#1]**	---	< 0.004	0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**0.02 [#1]**	---	0.009
B38X-OBS7	27-Sep-2000	**250 [#1]**	7.1	0.02	0.020	---	< 0.02	**< 0.05 [#1]**	0.008	**< 0.002 [#1]**	< 0.005	**0.006 [#1]**	**0.425 [#1]**	**< 0.03 [#1]**	---	< 0.005	0.033	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	**0.063 [#1]**

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
B38X-OBS8	03-Aug-2000	48	7.9	< 0.02	< 0.005	---	0.09	**< 0.05** [#1]	0.114	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.293	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
B38X-OBS9	03-Aug-2000	49	8.0	0.05	0.008	---	**0.10** [#1]	**< 0.05** [#1]	0.141	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.123	**< 0.03** [#1]	---	0.005	0.010	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	0.005
	23-Aug-2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-POSTGAC	01-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-POSTGAC	09-Aug-1999	39	8.1	---	---	---	< 0.02	**0.14** [#1]	0.127	**< 0.002** [#1]	< 0.002	< 0.001	0.103	**0.02** [#1]	---	< 0.004	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	0.026
	05-Sep-2000	48	7.8	< 0.02	< 0.005	2	0.03	**0.007** [#1]	0.035	**0.0001** [#1]	< 0.005	**< 0.005** [#1]	< 0.005	< 0.001	**< 0.00005** [#1]	0.014	0.081	**0.001** [#1]	< 0.0001	**< 0.03** [#1]	---	0.006
	18-Sep-2000	43	8.0	< 0.02	< 0.005	**13** [#1]	0.02	< 0.001	0.094	**< 0.0001** [#1]	< 0.005	**< 0.005** [#1]	0.013	< 0.001	**< 0.00005** [#1]	0.016	0.081	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	0.029
B38X-PREGAC	01-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-PREGAC	09-Aug-1999	41	8.0	---	---	---	< 0.02	**0.16** [#1]	0.119	**< 0.002** [#1]	< 0.002	< 0.001	0.153	**0.02** [#1]	---	< 0.004	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
	05-Sep-2000	47	7.7	< 0.02	< 0.005	---	< 0.02	**< 0.05** [#1]	0.074	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	< 0.005	**< 0.03** [#1]	---	0.014	0.093	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	18-Sep-2000	43	7.9	< 0.02	< 0.005	---	< 0.02	**< 0.05** [#1]	0.108	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.026	**< 0.03** [#1]	---	0.017	0.108	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
B38X-PREOW	01-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B38X-PREOW	09-Aug-1999	41	8.0	---	---	---	< 0.02	**0.16** [#1]	0.118	**< 0.002** [#1]	< 0.002	< 0.001	**0.956** [#1]	**< 0.02** [#1]	---	< 0.004	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
	05-Sep-2000	47	7.6	< 0.02	< 0.005	**97** [#1]	0.02	< 0.001	0.084	**0.0019** [#1]	< 0.005	**< 0.005** [#1]	< 0.005	0.003	**< 0.00005** [#1]	0.021	0.094	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	**0.049** [#1]
	18-Sep-2000	43	7.9	0.02	< 0.005	**52** [#1]	< 0.02	< 0.001	0.111	**0.0005** [#1]	< 0.005	**< 0.005** [#1]	0.042	0.001	**< 0.00005** [#1]	0.015	0.112	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	**0.046** [#1]
B38X-PRESTRIPPER	05-Sep-2000	48	7.7	< 0.02	< 0.005	---	0.04	**0.10** [#1]	0.085	**< 0.002** [#1]	0.006	**< 0.005** [#1]	< 0.005	**< 0.03** [#1]	---	0.012	0.098	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	18-Sep-2000	41	7.9	0.02	< 0.005	---	< 0.02	**< 0.05** [#1]	0.110	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.071	**< 0.03** [#1]	---	0.015	0.106	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	0.019
B38X-PUMP	22-Aug-1999	42	7.6	---	---	---	< 0.02	**0.08** [#1]	0.123	**< 0.002** [#1]	0.002	**0.009** [#1]	**1.16** [#1]	**0.05** [#1]	---	< 0.004	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
	01-Sep-2000	50	7.8	< 0.02	< 0.005	---	0.04	**< 0.05** [#1]	0.060	**0.003** [#1]	0.005	**0.011** [#1]	0.023	**< 0.03** [#1]	---	0.014	0.100	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	**0.047** [#1]
FTA 00-7-5	17-Sep-2000	69	7.3	< 0.02	< 0.005	**539** [#1]	< 0.02	**0.007** [#1]	0.027	**< 0.0001** [#1]	< 0.005	**< 0.005** [#1]	0.122	**0.051** [#1]	**< 0.00005** [#1]	< 0.005	0.022	**0.014** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
(Duplicate)	17-Sep-2000	69	7.1	< 0.02	< 0.005	**326** [#1]	< 0.02	**0.007** [#1]	0.023	**< 0.0001** [#1]	< 0.005	**< 0.005** [#1]	0.116	**0.046** [#1]	**< 0.00005** [#1]	< 0.005	0.021	**0.011** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
	27-Aug-2001	34.5	7.3	< 0.02	< 0.005	**361** [#1]	0.03	**< 0.05** [#1]	0.036	**< 0.002** [#1]	< 0.005	**0.008** [#1]	0.108	**0.09** [#1]	---	< 0.005	0.015	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	25-Aug-2003	**122** [#1]	6.8	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**2.893** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.008** [#1]	---	---	**< 1.0** [#1]	0.006
FTA 00-8-5	17-Sep-2000	**930** [#1]	7.0	< 0.02	0.008	**151** [#1]	< 0.02	< 0.001	0.017	**0.0002** [#1]	0.005	**< 0.005** [#1]	0.157	< 0.001	**< 0.00005** [#1]	< 0.005	0.022	**0.004** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
	27-Aug-2001	**537** [#1]	6.9	< 0.02	< 0.005	**679** [#1]	< 0.02	**0.07** [#1]	0.037	**< 0.002** [#1]	0.006	**< 0.005** [#1]	0.232	**< 0.03** [#1]	---	< 0.005	0.016	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	21-Aug-2002	**563** [#1]	7.9	< 0.02	< 0.005	**496** [#1]	0.011	**0.005** [#1]	0.040	**< 0.00010** [#1]	< 0.001	0.0033	**18.8** [#1]	0.0010	**0.00106** [#1]	< 0.005	0.028	**0.006** [#1]	< 0.0001	< 0.0001	0.00800	0.023
	25-Aug-2003	**467** [#1]	6.7	0.3	< 0.06	---	---	**0.007** [#1]	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**10.57** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.006** [#1]	---	---	**< 1.0** [#1]	0.013
FTA 00-8-5	23-Aug-2004	**890** [#1]	---	< 0.2	< 0.06	---	< 0.015	**< 0.015** [#1]	0.058	< 0.000051	< 0.005	**0.012** [#1]	**18.43** [#1]	< 0.003	**< 0.00005** [#1]	< 0.005	0.045	**0.009** [#1]	**< 0.0003** [#1]	**< 0.0024** [#1]	0.009	< 0.005
	25-Aug-2005	**748** [#1]	---	< 0.2	< 0.06	**170** [#1]	0.007	**0.0180** [#1]	< 0.05	0.00003	< 0.007	**0.005** [#1]	**29.0** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.051	**0.0230** [#1]	< 0.0001	< 0.0008	0.009	0.022
	21-Aug-2006	**476** [#1]	---	< 0.2	< 0.06	**91** [#1]	< 0.005	**0.025** [#1]	< 0.05	**0.00034** [#1]	< 0.007	**0.009** [#1]	**56.9** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.068	**0.028** [#1]	< 0.0001	< 0.0008	0.004	0.011
	19-Aug-2009	**410** [#1]	7.18	0.10	< 0.03	**230** [#1]	0.004	**0.020** [#1]	< 0.02	0.000008	< 0.001	0.0007	**71** [#1]	0.0004	---	0.0052	0.026	**0.015** [#1]	< 0.0001	< 0.0002	0.0023	0.011
	20-Aug-2010	**270** [#1]	7.13	0.053	0.034	**85** [#1]	0.004	**0.020** [#1]	< 0.02	< 0.00003	< 0.001	0.0009	**83** [#1]	0.0004	---	0.0031	0.016	**0.0073** [#1]	< 0.0001	< 0.0002	0.0010	0.006

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals														
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
FTA 00-9-5	20-Sep-2000	42	7.0	1.41	0.011	**4** [#1]	0.03	< 0.001	0.009	**0.0004** [#1]	< 0.005	**< 0.005** [#1]	0.014	< 0.001	**< 0.00005** [#1]	< 0.005	0.032	**0.008** [#1]	< 0.0001	**< 0.03** [#1]	---	0.019
	27-Aug-2001	**138** [#1]	6.7	**4.90** [#1]	0.050	< 1	0.03	**< 0.05** [#1]	0.013	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.016	**< 0.03** [#1]	---	0.007	0.044	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	21-Aug-2002	86.2	8.2	**4.70** [#1]	0.006	3	0.002	0.003	0.020	**0.00035** [#1]	< 0.001	**0.0076** [#1]	0.050	< 0.0005	**< 0.00005** [#1]	< 0.005	0.056	**0.020** [#1]	< 0.0001	0.0004	0.00221	**0.194** [#1]
	25-Aug-2003	**239** [#1]	**6.3** [#1]	0.8	< 0.06	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	0.046	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.010** [#1]	---	---	**< 1.0** [#1]	0.029
	23-Aug-2004	89	---	< 0.2	< 0.06	---	< 0.010	**< 0.010** [#1]	0.030	**0.000255** [#1]	< 0.005	**0.008** [#1]	0.176	< 0.002	**< 0.00005** [#1]	0.011	0.029	**0.012** [#1]	< 0.0002	**< 0.0016** [#1]	**0.030** [#1]	< 0.005
	25-Aug-2005	115	---	2.0	< 0.06	**13** [#1]	0.0108	< 0.005	< 0.05	**0.00049** [#1]	< 0.007	**0.009** [#1]	0.117	< 0.001	**< 0.00005** [#1]	< 0.006	0.062	**0.0152** [#1]	< 0.0001	**0.0008** [#1]	0.005	0.027
	21-Aug-2006	40	---	< 0.2	< 0.06	**5** [#1]	< 0.005	< 0.005	< 0.05	< 0.00001	< 0.007	**0.005** [#1]	**4.06** [#1]	< 0.001	**< 0.00005** [#1]	0.007	0.049	**0.011** [#1]	< 0.0001	**0.0009** [#1]	**0.037** [#1]	0.009
FTA 00-9-5	21-Aug-2007	65	---	< 0.2	< 0.06	3	0.003	0.003	< 0.02	**0.00012** [#1]	< 0.001	**0.0287** [#1]	**7.08** [#1]	0.0034	---	0.0078	0.0396	**0.006** [#1]	< 0.0001	0.0006	0.0132	**0.044** [#1]
	19-Aug-2009	< 50	7.36	0.013	< 0.003	3	< 0.001	0.0026	< 0.02	0.000032	< 0.001	0.0023	**2.5** [#1]	< 0.0002	---	0.018	0.059	**0.0011** [#1]	< 0.0001	0.0007	**0.027** [#1]	0.019
	20-Aug-2010	15	7.19	0.041	0.008	< 2	< 0.001	0.0011	< 0.02	0.00005	< 0.001	0.0014	0.06	< 0.0002	---	0.011	0.034	**0.0016** [#1]	< 0.0001	0.0005	0.0089	0.008
	18-Aug-2011	17	---	< 0.003	< 0.003	< 2	< 0.01	< 0.002	< 0.02	< 0.00005	**< 0.01** [#1]	< 0.002	**0.98** [#1]	< 0.002	---	0.006	0.029	**0.003** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.005	< 0.03
	31-Jul-2014	---	---	---	---	---	0.0043	< 0.00020	< 0.020	**0.00015** [#1]	< 0.0010	**0.0040** [#1]	< 0.060	0.00028	---	0.0089	0.018	**0.0058** [#1]	< 0.00010	0.00051	0.00086	0.0097
FTA 03-1-4	25-Aug-2003	**160** [#1]	6.8	< 0.2	< 0.06	---	---	< 0.005	0.053	**< 0.002** [#1]	< 0.007	**0.013** [#1]	**3.943** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	< 0.001	---	---	**< 1.0** [#1]	0.007
	23-Aug-2004	85	7.3	< 0.2	< 0.06	---	< 0.010	**< 0.010** [#1]	0.052	< 0.000034	< 0.005	**0.005** [#1]	**6.669** [#1]	< 0.002	**< 0.00005** [#1]	< 0.005	0.021	**< 0.002** [#1]	< 0.0002	**< 0.0016** [#1]	0.008	< 0.005
	25-Aug-2005	85.8	7.4	< 0.2	< 0.06	**40** [#1]	0.006	**0.0118** [#1]	0.06	0.00005	< 0.007	**0.005** [#1]	**26.6** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.017	**0.001** [#1]	< 0.0001	< 0.0008	0.006	**0.157** [#1]
	21-Aug-2006	86	7.5	< 0.2	< 0.06	**15** [#1]	< 0.005	**0.007** [#1]	< 0.05	**0.00025** [#1]	< 0.007	0.003	**13.3** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.031	< 0.001	< 0.0001	< 0.0008	0.011	< 0.005
	20-Aug-2007	79	6.9	< 0.2	< 0.06	**17** [#1]	0.005	**0.010** [#1]	0.03	0.00001	0.002	0.0012	**24.5** [#1]	0.0006	---	0.0055	0.0153	**0.003** [#1]	< 0.0001	< 0.0002	0.0056	0.008
FTA 03-1-4	19-Aug-2008	42	7.0	0.005	< 0.003	**17** [#1]	< 0.001	0.004	0.03	0.00002	< 0.001	**0.0054** [#1]	0.17	0.0004	---	0.0031	0.022	< 0.001	< 0.0001	< 0.0002	0.0078	**0.034** [#1]
(Duplicate)	19-Aug-2008	---	---	---	---	**23** [#1]	0.003	0.004	0.03	0.00004	< 0.001	**0.0075** [#1]	**13** [#1]	0.0005	---	0.0043	0.026	**0.001** [#1]	< 0.0001	< 0.0002	0.0090	**0.073** [#1]
	17-Aug-2009	71	7.21	0.013	< 0.003	**8** [#1]	0.005	**0.0061** [#1]	0.04	< 0.000005	< 0.001	0.0033	**23** [#1]	< 0.0002	---	0.0030	0.032	0.0004	< 0.0001	< 0.0002	**0.017** [#1]	0.015
(Duplicate)	17-Aug-2009	---	---	---	---	**19** [#1]	0.002	**0.0069** [#1]	0.04	< 0.000005	< 0.001	0.0028	**26** [#1]	< 0.0002	---	0.0032	0.031	0.0005	< 0.0001	< 0.0002	**0.016** [#1]	0.010
	22-Aug-2010	13	8.17	< 0.003	0.003	**< 10** [#1]	0.007	**0.0078** [#1]	0.06	< 0.00003	< 0.001	0.0009	**34** [#1]	< 0.0002	---	0.0017	0.0097	0.0003	< 0.0001	< 0.0002	0.0076	0.005
(Duplicate)	22-Aug-2010	---	---	---	---	**< 10** [#1]	0.007	**0.0076** [#1]	0.06	< 0.00003	< 0.001	0.0009	**38** [#1]	< 0.0002	---	0.0012	0.0098	0.0003	< 0.0001	< 0.0002	0.0066	0.006
	18-Aug-2011	50	---	0.017	< 0.003	3	< 0.01	0.002	0.04	< 0.00005	**< 0.01** [#1]	< 0.002	**11** [#1]	< 0.002	---	0.004	0.012	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	**0.015** [#1]	< 0.03
(Duplicate)	18-Aug-2011	---	---	---	---	**5** [#1]	0.01	0.003	0.04	< 0.00005	**< 0.01** [#1]	< 0.002	**14** [#1]	< 0.002	---	0.004	0.014	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	**0.016** [#1]	< 0.03
	20-Aug-2012	58	---	0.0093	0.0061	**4.3** [#1]	0.0074	0.0030	0.050	< 0.000025	< 0.0010	0.00032	**41** [#1]	< 0.00020	---	0.0022	0.013	0.00073	< 0.00010	< 0.00020	0.011	0.0075
(Duplicate)	20-Aug-2012	---	---	---	---	**5.0** [#1]	0.0089	0.0032	0.048	< 0.000025	< 0.0010	0.0018	**41** [#1]	< 0.00020	---	0.0021	0.014	0.00066	< 0.00010	< 0.00020	0.011	0.010
FTA 93-1-4	07-Sep-1997	79.5	8.0	< 0.02	< 0.005	**8** [#1]	0.04	0.0005	0.100	**< 0.002** [#1]	0.004	0.003	0.100	< 0.001	**0.00009** [#1]	< 0.004	< 0.008	0.0006	**< 0.01** [#1]	**< 0.02** [#1]	---	< 0.002
FTA 93-1-4	09-Sep-1998	80	7.8	0.33	**0.067** [#1]	**5** [#1]	0.02	< 0.001	0.084	**0.0001** [#1]	0.003	**0.004** [#1]	**0.301** [#1]	< 0.001	**< 0.00005** [#1]	< 0.004	< 0.008	**0.001** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	15-Sep-1999	89	8.4	< 0.02	< 0.005	---	< 0.02	0.003	0.076	**0.0001** [#1]	< 0.002	< 0.001	**2.22** [#1]	0.005	**< 0.00005** [#1]	0.010	< 0.008	**0.002** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	17-Sep-2000	93	7.5	0.02	< 0.005	**9** [#1]	< 0.02	0.001	0.065	**0.0001** [#1]	< 0.005	**< 0.005** [#1]	0.112	0.001	**< 0.00005** [#1]	< 0.005	< 0.008	**0.002** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
	26-Aug-2001	58.0	7.9	< 0.02	< 0.005	3	< 0.02	**< 0.05** [#1]	0.086	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.161	**< 0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	21-Aug-2002	95.4	8.3	< 0.02	< 0.005	**4** [#1]	**0.452** [#1]	0.002	0.089	0.00005	< 0.001	**0.0044** [#1]	**1.37** [#1]	0.0013	**0.00077** [#1]	< 0.005	0.008	< 0.001	< 0.0001	< 0.0001	0.0110	0.021
FTA 98-4-5	27-Sep-2000	53	7.2	0.03	0.006	---	0.03	**0.09** [#1]	0.055	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**3.10** [#1]	**< 0.03** [#1]	---	< 0.005	0.022	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	27-Aug-2001	23.8	7.1	< 0.02	< 0.005	**985** [#1]	0.05	**< 0.05** [#1]	0.053	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	**5.65** [#1]	**0.03** [#1]	---	< 0.005	< 0.008	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	21-Aug-2002	24.3	8.0	< 0.02	0.006	**525** [#1]	0.008	**0.013** [#1]	0.054	< 0.00001	< 0.001	0.0015	**34.7** [#1]	0.0015	**0.00050** [#1]	< 0.005	0.013	**0.006** [#1]	< 0.0001	< 0.0001	0.00492	0.011
	19-Aug-2008	78	---	0.003	< 0.003	**980** [#1]	0.010	**0.009** [#1]	0.05	**0.00009** [#1]	< 0.001	0.0028	**8.9** [#1]	0.0016	---	0.0028	0.014	**0.002** [#1]	< 0.0001	< 0.0002	0.0063	**0.097** [#1]

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
FTA 99-2-4	27-Sep-2000	**930** [#1]	6.9	0.03	< 0.030	---	< 0.02	**0.05** [#1]	0.014	**< 0.002** [#1]	0.005	**< 0.005** [#1]	**2.04** [#1]	**< 0.03** [#1]	---	< 0.005	0.039	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	26-Aug-2001	**564** [#1]	7.2	< 0.02	0.007	**610** [#1]	< 0.02	**< 0.05** [#1]	0.028	**< 0.002** [#1]	< 0.005	**< 0.005** [#1]	0.017	**< 0.03** [#1]	---	0.006	0.030	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	21-Aug-2002	**511** [#1]	7.9	< 0.02	< 0.005	**285** [#1]	0.022	**0.010** [#1]	0.023	**< 0.00010** [#1]	< 0.001	0.0029	**57.2** [#1]	0.0017	**0.00033** [#1]	< 0.005	0.036	**0.005** [#1]	< 0.0001	< 0.0001	0.00329	0.025
	25-Aug-2003	**311** [#1]	6.7	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**< 0.009** [#1]	**49.07** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.002** [#1]	---	---	**< 1.0** [#1]	0.008
	25-Aug-2005	**348** [#1]	---	< 0.2	< 0.06	**562** [#1]	0.008	**0.0421** [#1]	< 0.05	0.00004	< 0.007	**0.004** [#1]	**23.1** [#1]	0.006	**< 0.00005** [#1]	< 0.006	0.032	**0.0220** [#1]	< 0.0001	< 0.0008	0.006	**0.113** [#1]
FTA 99-2-4	19-Aug-2008	**220** [#1]	---	0.003	< 0.003	**310** [#1]	< 0.001	**0.013** [#1]	< 0.02	0.00001	< 0.001	0.0029	**0.59** [#1]	0.0032	---	0.0018	0.039	**0.002** [#1]	< 0.0001	< 0.0002	0.0058	0.013
	22-Aug-2010	**140** [#1]	7.30	< 0.003	0.003	**380** [#1]	0.007	**0.018** [#1]	0.02	< 0.00003	< 0.001	0.0010	**16** [#1]	0.0014	---	0.0015	0.034	**0.0027** [#1]	< 0.0001	< 0.0002	0.0048	0.007
	18-Aug-2011	**120** [#1]	7.19	0.004	< 0.003	**540** [#1]	0.01	**0.016** [#1]	< 0.02	< 0.00005	**< 0.01** [#1]	< 0.002	**42** [#1]	< 0.002	---	< 0.002	0.030	**0.004** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.003	< 0.03
	25-Aug-2013	**160** [#1]	---	< 0.030	< 0.030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	**300** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**190** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	110	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA 99-3-4	15-Sep-1999	**1100** [#1]	7.8	< 0.02	< 0.005	**61** [#1]	0.05	0.003	0.032	< 0.0001	0.005	< 0.001	**25.2** [#1]	0.002	**< 0.00005** [#1]	< 0.004	0.025	**0.002** [#1]	< 0.0001	**< 0.02** [#1]	---	< 0.002
	18-Oct-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**640** [#1]	6.9	< 0.02	< 0.005	**44** [#1]	< 0.02	< 0.001	0.032	< 0.0001	< 0.005	**< 0.005** [#1]	**0.591** [#1]	0.004	**< 0.00005** [#1]	< 0.005	0.032	**0.006** [#1]	< 0.0001	**< 0.03** [#1]	---	< 0.005
	26-Aug-2001	**633** [#1]	7.0	0.04	< 0.005	**32** [#1]	< 0.02	**< 0.05** [#1]	0.054	**< 0.002** [#1]	0.006	**< 0.005** [#1]	**0.440** [#1]	**< 0.03** [#1]	---	< 0.005	0.041	**< 0.03** [#1]	**< 0.01** [#1]	**< 0.03** [#1]	---	< 0.005
	21-Aug-2002	**407** [#1]	7.5	< 0.02	< 0.005	**27** [#1]	0.010	0.002	0.041	< 0.00010	< 0.001	**0.0044** [#1]	**1.26** [#1]	0.0010	**0.00083** [#1]	< 0.005	0.048	**0.002** [#1]	< 0.0001	< 0.0001	0.00574	0.018
	25-Aug-2003	**797** [#1]	**6.5** [#1]	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002** [#1]	< 0.007	**0.012** [#1]	**5.307** [#1]	**< 0.10** [#1]	**< 0.00005** [#1]	---	---	**0.004** [#1]	---	---	**< 1.0** [#1]	0.014
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**469** [#1]	---	< 0.2	< 0.06	---	< 0.010	**< 0.010** [#1]	0.045	< 0.000034	< 0.005	**0.006** [#1]	**27.17** [#1]	< 0.002	**< 0.00005** [#1]	< 0.005	0.047	**0.009** [#1]	< 0.0002	**< 0.0016** [#1]	0.008	< 0.005
	25-Aug-2005	**477** [#1]	---	< 0.2	< 0.06	**42** [#1]	< 0.005	**0.008** [#1]	< 0.05	0.00003	< 0.007	**0.004** [#1]	**13.4** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.079	**0.007** [#1]	< 0.0001	< 0.0008	0.008	0.005
	21-Aug-2006	**434** [#1]	---	< 0.2	< 0.06	**28** [#1]	< 0.005	**0.013** [#1]	< 0.05	**0.00052** [#1]	< 0.007	**0.405** [#1]	**30.5** [#1]	**1.4** [#1]	**< 0.00005** [#1]	< 0.006	0.058	**0.002** [#1]	< 0.0001	< 0.0008	0.009	**0.238** [#1]
	21-Aug-2007	---	---	---	---	**58** [#1]	0.005	**0.058** [#1]	0.06	0.00007	0.005	0.0022	**42.5** [#1]	0.0004	---	0.0306	0.0649	**0.020** [#1]	< 0.0001	< 0.0002	**0.0344** [#1]	0.024
	18-Aug-2008	**380** [#1]	---	0.005	< 0.003	**48** [#1]	< 0.001	**0.013** [#1]	0.05	< 0.00001	< 0.001	**0.0047** [#1]	**37** [#1]	< 0.0002	---	0.0014	0.023	**0.001** [#1]	< 0.0001	< 0.0002	0.0071	0.027
	19-Aug-2009	**370** [#1]	7.27	< 0.003	< 0.003	**22** [#1]	0.003	**0.0060** [#1]	0.03	0.000046	< 0.001	0.0021	**22** [#1]	0.0002	---	0.014	0.040	**0.0025** [#1]	< 0.0001	< 0.0002	0.011	0.005
	20-Aug-2010	**310** [#1]	7.07	0.009	0.032	**11** [#1]	0.008	**0.0080** [#1]	0.05	< 0.00003	< 0.001	0.0029	**42** [#1]	0.0005	---	0.0015	0.055	**0.0016** [#1]	< 0.0001	< 0.0002	0.0045	0.008
	18-Aug-2011	**290** [#1]	---	0.003	< 0.003	**22** [#1]	0.01	**0.008** [#1]	0.03	< 0.00005	**< 0.01** [#1]	< 0.002	**47** [#1]	< 0.002	---	< 0.002	0.018	**0.003** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.003	< 0.03
	20-Aug-2012	**190** [#1]	---	< 0.0030	< 0.0030	**35** [#1]	0.020	**0.014** [#1]	0.038	0.000013	< 0.0010	0.0012	**43** [#1]	0.00053	---	0.00063	0.011	**0.0022** [#1]	< 0.00010	< 0.00020	0.0034	0.0088
FTA 99-3-4	25-Aug-2013	**210** [#1]	---	< 0.030	< 0.030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2013	**220** [#1]	---	< 0.030	< 0.030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	---	---	---	---	---	0.014	**0.0066** [#1]	0.031	0.000028	< 0.0010	0.0028	**42** [#1]	0.00024	---	< 0.00020	0.0067	**0.0013** [#1]	< 0.00010	< 0.00020	0.0018	0.0098
(Duplicate)	09-Aug-2015	---	---	---	---	---	0.014	**0.0067** [#1]	0.034	0.000025	< 0.0010	0.0027	**42** [#1]	0.00023	---	< 0.00020	0.0072	**0.0012** [#1]	< 0.00010	< 0.00020	0.0018	0.0083
	11-Aug-2015	**180** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**160** [#1]	---	< 0.010	< 0.010	---	0.019	**0.0066** [#1]	0.036	**0.00028** [#1]	< 0.0010	0.00067	**34** [#1]	0.00031	---	0.00038	0.011	**0.0012** [#1]	< 0.00010	< 0.00020	0.0026	0.011
(Duplicate)	04-Aug-2016	**160** [#1]	---	< 0.010	< 0.010	---	0.019	**0.0066** [#1]	0.037	**0.00028** [#1]	< 0.0010	0.00050	**34** [#1]	0.00031	---	0.00031	0.011	**0.0012** [#1]	< 0.00010	< 0.00020	0.0027	0.0071
	10-Sep-2016	**130** [#1]	7.38	0.076	< 0.010	**40** [#1]	0.0048	0.0026	0.047	0.000089	< 0.0010	< 0.00020	**7.2** [#1]	< 0.00020	---	0.00027	0.0052	**0.0011** [#1]	< 0.00010	< 0.00020	0.0017	< 0.0030
	17-Aug-2017	**150** [#1]	---	< 0.010	< 0.010	---	0.030	**0.014** [#1]	0.045	< 0.000020	< 0.0010	0.00074	**54** [#1]	0.00036	---	0.00035	0.0053	**0.0020** [#1]	< 0.00010	< 0.00020	0.0023	0.0077

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	**Date (dd-mmm-yyyy)**	**Chloride (mg/L)**	**pH (pH Units)**	**Nitrate (as N) (mg/L)**	**Nitrite (as N) (mg/L)**	**Phenols (µg/L)**	**Aluminum (mg/L)**	**Arsenic (mg/L)**	**Boron (mg/L)**	**Cadmium (mg/L)**	**Chromium (Total) (mg/L)**	**Copper (mg/L)**	**Iron (mg/L)**	**Lead (mg/L)**	**Mercury (mg/L)**	**Molybdenum (mg/L)**	**Nickel (mg/L)**	**Selenium (mg/L)**	**Silver (mg/L)**	**Thallium (mg/L)**	**Uranium (mg/L)**	**Zinc (mg/L)**
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
FTA 99-5-6	15-Sep-1999	9.6	8.5	0.02	< 0.005	**58 [#1]**	< 0.02	**0.010 [#1]**	0.089	< 0.0001	< 0.002	< 0.001	**5.95 [#1]**	< 0.001	**< 0.00005 [#1]**	0.011	< 0.008	**0.002 [#1]**	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	18-Oct-1999	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA 99-5-6	17-Sep-2000	13	7.6	< 0.02	< 0.005	**86 [#1]**	< 0.02	**0.007 [#1]**	0.075	< 0.0001	< 0.005	**< 0.005 [#1]**	**1.26 [#1]**	0.002	**< 0.00005 [#1]**	< 0.005	< 0.008	< 0.001	< 0.0001	**< 0.03 [#1]**	---	0.005
	21-Aug-2002	10.0	8.0	< 0.02	< 0.005	**39 [#1]**	**0.819 [#1]**	**0.014 [#1]**	0.078	0.00005	< 0.001	**0.0041 [#1]**	**19.4 [#1]**	0.0028	**0.00077 [#1]**	< 0.005	< 0.008	**0.002 [#1]**	< 0.0001	< 0.0001	0.00116	0.008
(Duplicate)	21-Aug-2002	10.1	8.4	< 0.02	< 0.005	**40 [#1]**	**0.285 [#1]**	**0.013 [#1]**	0.090	< 0.00001	< 0.001	0.0028	**19.9 [#1]**	0.0018	**0.00052 [#1]**	< 0.005	< 0.008	**0.001 [#1]**	< 0.0001	< 0.0001	0.00102	0.016
	25-Aug-2003	14	7.2	< 0.2	< 0.06	---	---	**0.007 [#1]**	0.080	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	**3.463 [#1]**	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	**0.002 [#1]**	---	---	**< 1.0 [#1]**	0.006
(Duplicate)	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	26	---	< 0.2	< 0.06	**58 [#1]**	0.002	**0.023 [#1]**	0.08	< 0.00001	0.003	0.0022	**15.7 [#1]**	0.0016	---	0.0062	0.0034	**0.007 [#1]**	< 0.0001	< 0.0002	0.0010	0.008
	19-Aug-2008	35	---	0.003	< 0.003	**35 [#1]**	0.012	**0.015 [#1]**	0.10	0.00001	< 0.001	0.0014	**10 [#1]**	0.0006	---	0.0039	0.0012	< 0.001	< 0.0001	< 0.0002	0.0002	**0.058 [#1]**
FTA 99-6-12	25-Aug-2003	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	10	---	< 0.2	< 0.06	---	< 0.010	**< 0.010 [#1]**	1.006	< 0.000034	< 0.005	**0.009 [#1]**	**0.924 [#1]**	< 0.002	**< 0.00005 [#1]**	< 0.005	< 0.008	**< 0.002 [#1]**	< 0.0002	**< 0.0016 [#1]**	< 0.002	< 0.005
(Duplicate)	23-Aug-2004	---	---	---	---	---	< 0.005	< 0.005	1.015	< 0.000017	< 0.005	**0.005 [#1]**	**0.891 [#1]**	< 0.001	**< 0.00005 [#1]**	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	25-Aug-2005	11.7	---	< 0.2	< 0.06	**9 [#1]**	< 0.005	< 0.005	0.80	0.00002	< 0.007	**0.007 [#1]**	0.042	< 0.001	**< 0.00005 [#1]**	< 0.006	< 0.008	**0.001 [#1]**	< 0.0001	< 0.0008	< 0.001	< 0.005
(Duplicate)	25-Aug-2005	---	---	---	---	**6 [#1]**	< 0.005	< 0.005	0.83	0.00002	< 0.007	**0.004 [#1]**	0.040	< 0.001	**< 0.00005 [#1]**	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	21-Aug-2006	15	---	< 0.2	< 0.06	**6 [#1]**	< 0.005	< 0.005	0.91	< 0.00001	< 0.007	< 0.002	0.007	< 0.001	**< 0.00005 [#1]**	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
(Duplicate)	21-Aug-2006	---	---	---	---	**5 [#1]**	---	< 0.005	0.88	< 0.00001	< 0.007	< 0.002	0.261	< 0.001	**< 0.00005 [#1]**	< 0.006	< 0.008	< 0.001	< 0.0001	---	< 0.001	< 0.005
	20-Aug-2007	23	---	< 0.2	< 0.06	2	0.001	0.002	0.85	< 0.00001	0.002	0.0013	**0.36 [#1]**	< 0.0002	---	< 0.0002	< 0.0005	**0.001 [#1]**	< 0.0001	< 0.0002	< 0.0001	0.014
(Duplicate)	20-Aug-2007	---	---	---	---	< 1	0.002	0.002	0.85	< 0.00001	0.004	0.0013	**0.38 [#1]**	< 0.0002	---	< 0.0002	< 0.0005	**0.002 [#1]**	< 0.0001	< 0.0002	< 0.0001	0.018
	19-Aug-2008	36	---	0.003	< 0.003	**9 [#1]**	0.005	< 0.001	0.86	< 0.00001	< 0.001	0.0016	0.18	< 0.0002	---	< 0.0002	0.0011	< 0.001	< 0.0001	< 0.0002	< 0.0001	**0.066 [#1]**
FTA 99-6-12	20-Aug-2012	**160 [#1]**	---	< 0.0030	0.0047	3.4	0.0036	0.0018	0.87	< 0.000025	< 0.0010	0.00023	**0.72 [#1]**	0.00087	---	0.00089	0.0020	0.00037	< 0.00010	< 0.00020	0.00056	0.0085
	24-Aug-2013	87	---	0.042	0.0097	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	66	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	65	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	78	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Sep-2016	77	7.77	< 0.010	< 0.010	**37 [#1]**	< 0.0030	**0.0053 [#1]**	0.32	< 0.000020	< 0.0010	0.00034	< 0.060	0.0015	---	0.0040	0.0035	**0.0010 [#1]**	< 0.00010	< 0.00020	0.0017	< 0.0030
(Duplicate)	10-Sep-2016	76	7.82	< 0.010	< 0.010	**31 [#1]**	< 0.0030	**0.0053 [#1]**	0.33	< 0.000020	< 0.0010	0.00020	< 0.060	0.0016	---	0.0041	0.0038	0.00094	< 0.00010	< 0.00020	0.0018	< 0.0030
	13-Aug-2017	64	---	0.012	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FTA-OBS-56	20-Aug-2012	**120 [#1]**	7.04	0.014	0.0043	**120 [#1]**	0.0077	**0.0063 [#1]**	0.023	< 0.000025	< 0.0010	0.00035	**63 [#1]**	0.00023	---	0.0032	0.031	**0.0012 [#1]**	< 0.00010	< 0.00020	0.0014	0.014
	06-Jul-2016	**200 [#1]**	7.38	< 0.010	< 0.010	**200 [#1]**	0.027	**0.014 [#1]**	< 0.020	< 0.000020	< 0.0010	0.0011	**30 [#1]**	0.00077	---	0.00061	0.0056	**0.0017 [#1]**	< 0.00010	< 0.00020	0.0032	0.0052
FTA-OBS-58	20-Aug-2012	6.1	7.78	< 0.0030	0.0044	**33 [#1]**	0.0046	0.0042	0.059	< 0.000025	< 0.0010	0.00045	0.21	0.00027	---	0.0043	0.0096	0.00070	< 0.00010	< 0.00020	0.0012	0.0061
	06-Jul-2016	26	7.63	< 0.010	< 0.010	**150 [#1]**	0.0065	**0.011 [#1]**	0.044	< 0.000020	< 0.0010	0.0010	**25 [#1]**	0.00036	---	0.0045	0.0040	0.00069	< 0.00010	< 0.00020	0.00040	0.0063
FTA-INLET	17-Sep-2004	56	6.8	< 0.2	< 0.06	---	---	---	---	---	---	---	**68.21 [#1]**	---	---	---	---	---	---	---	---	---
	27-Jun-2010	99	7.31	0.005	< 0.003	---	---	---	---	---	---	---	0.13	---	---	---	---	---	---	---	---	---
FTA-N-INLET	20-Aug-2011	110	7.31	< 0.03	< 0.03	---	---	---	---	---	---	---	**37 [#1]**	---	---	---	---	---	---	---	---	---

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
FTA-N-INLET	26-Sep-2012	26	6.92	0.016	< 0.0030	---	---	---	---	---	---	---	**58 [#1]**	---	---	---	---	---	---	---	---	---
	22-Sep-2013	49	7.19	< 0.0030	< 0.0030	---	---	---	---	---	---	---	**59 [#1]**	---	---	---	---	---	---	---	---	---
	19-Sep-2014	**120 [#1]**	7.07	< 0.010	< 0.010	---	0.015	**0.0055 [#1]**	0.051	0.000046	< 0.0010	0.0013	**35 [#1]**	0.00044	---	0.0095	0.0064	**0.0018 [#1]**	< 0.00010	< 0.00020	**0.053 [#1]**	0.0034
	20-Aug-2015	**140 [#1]**	7.61	< 0.010	< 0.010	---	0.013	**0.0051 [#1]**	0.044	< 0.000020	< 0.0010	0.00031	**65 [#1]**	< 0.00020	---	0.016	0.0050	**0.0013 [#1]**	< 0.00010	< 0.00020	**0.026 [#1]**	< 0.0030
	06-Jul-2016	**120 [#1]**	7.14	< 0.010	< 0.010	**62 [#1]**	0.0084	0.0049	0.038	< 0.000020	< 0.0010	< 0.00020	**56 [#1]**	< 0.00020	---	0.014	0.0062	**0.0015 [#1]**	< 0.00010	< 0.00020	**0.032 [#1]**	< 0.0030
FTA-OBS14	01-Oct-2001	**339 [#1]**	7.0	< 0.02	0.009	---	< 0.02	**< 0.05 [#1]**	0.017	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	**0.384 [#1]**	**< 0.03 [#1]**	---	< 0.005	0.011	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	23-Aug-2004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Jul-2016	39	7.32	< 0.010	< 0.010	**29 [#1]**	0.037	**0.0075 [#1]**	< 0.020	0.000037	< 0.0010	0.0011	**34 [#1]**	< 0.00020	---	0.0019	0.0065	**0.0041 [#1]**	< 0.00010	< 0.00020	0.0050	< 0.0030
FTA-OBS16	01-Oct-2001	**142 [#1]**	7.1	< 0.02	0.007	---	0.02	**< 0.05 [#1]**	0.046	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.183	**< 0.03 [#1]**	---	< 0.005	0.014	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
FTA-TR1	01-Oct-2001	**384 [#1]**	6.7	< 0.02	< 0.005	---	< 0.02	**0.06 [#1]**	0.021	**0.008 [#1]**	0.005	**0.023 [#1]**	0.019	**< 0.03 [#1]**	---	0.016	**0.989 [#1]**	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	**1.01 [#1]**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH									
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
LT7-OBS-53	19-Aug-2012	**14** [#1]	**7.5** [#1]	**0.96** [#1]	3.9	18	50	---	---	---	---	---	---	---	---	---	---
B38 00-28-6	17-Sep-2000	< 0.0050	**< 0.0050** [#1]	< 0.0050	0.016	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2002	< 0.0050	**< 0.0050** [#1]	< 0.0050	< 0.01	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	0.16	< 0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	22-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
B38 00-32-44	21-Jul-2001	**0.99** [#1]	**1.9** [#1]	**0.24** [#1]	1.1	---	---	---	---	---	---	---	---	---	---	---	---
B38 02-17-3	20-Aug-2002	**2.2** [#1]	**< 0.025** [#1]	< 0.025	< 0.025	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	0.318	**< 0.0050** [#1]	< 0.0050	< 0.01	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	0.0325	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	24-Aug-2005	0.0178	< 0.0005	< 0.0005	< 0.0015	0.13	< 0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	0.0039	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	0.0329	< 0.0004	< 0.0004	< 0.0008	0.157	1.0	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.16	< 0.0004	< 0.0004	0.0021	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2008	0.11	< 0.0004	< 0.0004	0.0012	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2009	0.0045	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2009	0.0060	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	22-Aug-2010	0.031	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	17-Aug-2011	0.011	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2012	0.0039	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	0.0012	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---
B38 02-24-7	20-Aug-2002	**0.57** [#1]	**< 0.0050** [#1]	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	**2.04** [#1]	**< 0.0500** [#1]	< 0.0500	< 0.1	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**2.96** [#1]	**< 0.0500** [#1]	< 0.0500	< 0.1	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---
B38 02-36-3	20-Aug-2002	**0.94** [#1]	**< 0.0050** [#1]	< 0.0050	< 0.01	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2003	**0.895** [#1]	**< 0.0050** [#1]	< 0.0050	(0.0153-0.0203)	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	22-Aug-2004	**0.783** [#1]	**< 0.0050** [#1]	< 0.0050	< 0.01	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	**0.493** [#1]	**< 0.005** [#1]	< 0.005	< 0.015	0.14	0.1	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2005	**0.509** [#1]	**< 0.005** [#1]	< 0.005	< 0.015	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	**0.411** [#1]	**< 0.005** [#1]	< 0.005	< 0.01	0.167	0.2	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2006	**0.408** [#1]	**< 0.005** [#1]	< 0.005	< 0.01	0.125	0.2	---	---	---	---	---	---	---	---	---	---

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH									
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
B38 02-36-3 (cont)	20-Aug-2007	0.0473	< 0.0004	< 0.0004	< 0.0008	0.424	0.5	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.2	< 0.0004	< 0.0004	< 0.0008	0.49	1.3	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	0.0007	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2010	0.069	< 0.0004	0.0005	< 0.0008	< 0.1	0.8	---	---	---	---	---	---	---	---	---	---
	19-Aug-2012	0.19	< 0.00060	0.0093	< 0.00080	1	1.9	---	---	---	---	---	---	---	---	---	---
B38 03-37-5	25-Aug-2003	**14.6 [#1]**	**12 [#1]**	**1.32 [#1]**	5.66	---	---	---	---	---	---	---	---	---	---	---	---
B38 03-38-5	25-Aug-2003	**3.26 [#1]**	**0.0124 [#1]**	0.0036	0.0153	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2003	**3.07 [#1]**	**0.0115 [#1]**	< 0.0005	(0.0049-0.0054)	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**4.11 [#1]**	**< 0.0500 [#1]**	< 0.0500	< 0.1	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	**5.54 [#1]**	**< 0.05 [#1]**	< 0.05	< 0.15	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	**5.68 [#1]**	**< 0.05 [#1]**	< 0.05	< 0.1	0.2	0.1	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	**6.54 [#1]**	< 0.0004	0.0033	0.0080	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	**5.2 [#1]**	< 0.0004	< 0.0004	0.0081	< 0.1	0.2	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	**8.4 [#1]**	< 0.0004	0.0021	0.017	< 0.1	0.7	---	---	---	---	---	---	---	---	---	---
	22-Aug-2010	**7.9 [#1]**	< 0.0004	0.0016	0.014	< 0.1	0.3	---	---	---	---	---	---	---	---	---	---
	19-Aug-2011	**9.9 [#1]**	0.0005	0.0024	0.02	< 0.1	0.4	---	---	---	---	---	---	---	---	---	---
	19-Aug-2012	**8.9 [#1]**	< 0.00040	0.0024	0.015	< 0.1	0.43	---	---	---	---	---	---	---	---	---	---
	26-Aug-2013	**9.7 [#1]**	< 0.00040	0.0028	0.021	< 0.1	1.2	---	---	---	---	---	---	---	---	---	---
	01-Aug-2014	**8.3 [#1]**	< 0.00040	0.0025	0.025	0.27	0.27	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**6.4 [#1]**	0.00045	0.0022	0.019	0.24	0.69	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**8.4 [#1]**	0.00049	0.0022	0.017	< 0.1	0.34	---	---	---	---	---	---	---	---	---	---
	13-Aug-2017	**9.9 [#1]**	0.00045	0.0019	0.011	< 0.10	0.64	---	---	---	---	---	---	---	---	---	---
B38 03-40-5	25-Aug-2003	**16.5 [#1]**	**11.6 [#1]**	**1.02 [#1]**	3.76	---	---	---	---	---	---	---	---	---	---	---	---
B38 08-2-4	22-Aug-2010	**15 [#1]**	**0.7 [#1]**	**0.092 [#1]**	1.6	< 0.1	1.2	---	---	---	---	---	---	---	---	---	---
	17-Aug-2011	**14 [#1]**	**0.72 [#1]**	0.039	1.2	< 0.1	2.0	---	---	---	---	---	---	---	---	---	---
	26-Aug-2013	**17 [#1]**	**0.19 [#1]**	0.046	0.57	< 0.1	0.65	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**12 [#1]**	**0.4 [#1]**	0.039	0.64	< 0.1	1.2	---	---	---	---	---	---	---	---	---	---
	03-Aug-2016	**15 [#1]**	**0.44 [#1]**	0.062	0.66	< 0.1	0.98	---	---	---	---	---	---	---	---	---	---
B38 08-3-4	19-Aug-2008	0.0026	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	22-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---	---
B38 08-4-4	19-Aug-2008	**14 [#1]**	**12 [#1]**	**0.92 [#1]**	3.7	< 0.1	15.9	---	---	---	---	---	---	---	---	---	---

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
B38 93-1-2	17-Sep-2000	< 0.0050	**< 0.0050 [#1]**	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
B38 93-13-6	07-Sep-1997	**25 [#1]**	**9.8 [#1]**	**0.86 [#1]**	3.8	---	---	---	---	---	---	---	---	---	---	---	---
	21-Oct-1998	**13 [#1]**	**8.6 [#1]**	**0.62 [#1]**	3.63	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	**14 [#1]**	**6.9 [#1]**	**0.48 [#1]**	2.81	---	---	---	---	---	---	---	---	---	---	---	---
B38 93-2-4	17-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
B38 93-20-7	27-Aug-2001	**6.8 [#1]**	**0.74 [#1]**	**0.38 [#1]**	2.52	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	**5.49 [#1]**	**0.375 [#1]**	**0.388 [#1]**	1.77	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2005	**3.12 [#1]**	**0.0203 [#1]**	**0.198 [#1]**	0.645	2.1	2.8	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	**2.72 [#1]**	**< 0.05 [#1]**	< 0.05	0.37	1.97	2.4	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	0.0725	< 0.0004	0.0314	0.242	1.02	18.2	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.15	< 0.0004	0.025	0.11	4.1	27.7	---	---	---	---	---	---	---	---	---	---
	19-Aug-2009	**1 [#1]**	**0.043 [#1]**	**0.17 [#1]**	0.45	1.5	4.4	---	---	---	---	---	---	---	---	---	---
	10-Sep-2016	0.18	< 0.00040	0.017	0.017	0.39	9.8	0.00025	---	**0.00014 [#1]**	**0.000055 [#1]**	0.000014	**0.00012 [#1]**	0.0011	**0.0013 [#1]**	**0.0017 [#1]**	**0.00039 [#1]**
B38 97-9-5	15-Jul-1997	**22 [#1]**	**21 [#1]**	**0.94 [#1]**	4.6	---	---	---	---	---	---	---	---	---	---	---	---
	21-Oct-1998	**18 [#1]**	**15 [#1]**	**0.78 [#1]**	3.67	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	**13 [#1]**	**14 [#1]**	**0.91 [#1]**	4	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**13 [#1]**	**14 [#1]**	**1 [#1]**	4.7	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	**15.1 [#1]**	**17.7 [#1]**	**1.18 [#1]**	5.88	---	---	---	---	---	---	---	---	---	---	---	---
B38 98-19-5	09-Sep-1998	**4.8 [#1]**	**0.089 [#1]**	**< 0.13 [#1]**	< 0.26	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	09-Sep-1998	**4.1 [#1]**	**< 0.13 [#1]**	**< 0.13 [#1]**	< 0.26	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	**11 [#1]**	**< 0.1 [#1]**	**0.31 [#1]**	0.58	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**10 [#1]**	**< 0.05 [#1]**	**0.39 [#1]**	0.56	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	**12 [#1]**	**< 0.1 [#1]**	**0.27 [#1]**	(0.17-0.27)	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	**7.11 [#1]**	**< 0.0500 [#1]**	**0.151 [#1]**	0.307	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**4.5 [#1]**	**< 0.0500 [#1]**	0.0844	< 0.1	< 0.1	0.5	---	---	---	---	---	---	---	---	---	---
	24-Aug-2005	**4.96 [#1]**	< 0.0005	0.0751	0.0036	< 0.1	2.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	0.303	< 0.0005	< 0.0005	< 0.001	0.903	0.9	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2006	**0.457 [#1]**	< 0.0005	< 0.0005	< 0.001	0.675	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.3	< 0.0004	0.0023	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	0.22	0.4	---	---	---	---	---	---	---	---	---	---
	10-Sep-2016	**0.67 [#1]**	< 0.00040	0.0025	0.00082	0.33	4.0	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.00014	0.00018	0.00018	0.000022

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	PHC: Toluene (mg/L)	PHC: Ethylbenzene (mg/L)	PHC: Xylenes (Total) (mg/L)	PHC: PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC: PHC F2 (C_{10}-C_{16}) (mg/L)	PAH: Acenaphthene (mg/L)	PAH: Acridine (mg/L)	PAH: Anthracene (mg/L)	PAH: Benzo(a)Anthracene (mg/L)	PAH: Benzo(a)Pyrene (mg/L)	PAH: Fluoranthene (mg/L)	PAH: Fluorene (mg/L)	PAH: Naphthalene (mg/L)	PAH: Phenanthrene (mg/L)	PAH: Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
B38 98-22-3	09-Sep-1998	0.018	**0.0021 [#1]**	0.0012	0.0035	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	0.0089	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	0.0016	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	17-Aug-2009	0.02	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
B38 98-6-5	09-Sep-1998	**1.9 [#1]**	**0.054 [#1]**	**0.12 [#1]**	0.31	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1999	**0.97 [#1]**	**0.0083 [#1]**	0.051	0.13	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**2.8 [#1]**	**0.064 [#1]**	0.084	0.22	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	**2.2 [#1]**	**< 0.025 [#1]**	0.044	0.094	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2002	**0.77 [#1]**	**< 0.01 [#1]**	0.019	0.08	---	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2003	**2.85 [#1]**	**< 0.0500 [#1]**	**0.105 [#1]**	0.267	1.4	---	---	---	---	---	---	---	---	---	---	---
B38 98-7-3	21-Oct-1998	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
B38 98-8-4	09-Sep-1998	**8.5 [#1]**	**4.9 [#1]**	**0.79 [#1]**	3.5	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	**16 [#1]**	**14 [#1]**	**1.6 [#1]**	7.2	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-14-4	26-Aug-2001	**21 [#1]**	**15 [#1]**	**1.1 [#1]**	6	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-15-4	27-Aug-2001	0.0094	**0.0095 [#1]**	0.0088	0.062	---	---	---	---	---	---	---	---	---	---	---	---
B38 99-4-30	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
B38 DP99-1	18-Sep-1999	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
B38 MP00-2	21-Sep-2000	< 0.0050	**< 0.0050 [#1]**	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---
B38 MP00-3	21-Sep-2000	< 0.0050	**< 0.0050 [#1]**	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---
B38 MP00-4	21-Sep-2000	< 0.0050	**< 0.0050 [#1]**	< 0.0050	< 0.0050	---	---	---	---	---	---	---	---	---	---	---	---
B38-N-OBS-59	06-Jul-2016	**2.5 [#1]**	**1.5 [#1]**	**0.096 [#1]**	0.81	6.8	240	**< 0.01 [#1]**	---	**< 0.0010 [#1]**	**< 0.00085 [#1]**	**< 0.00075 [#1]**	**< 0.0010 [#1]**	**0.029 [#1]**	**0.045 [#1]**	**0.062 [#1]**	**0.0043 [#1]**
B38-N-OBS-61	06-Jul-2016	**9.3 [#1]**	**6.4 [#1]**	**0.43 [#1]**	2.5	< 0.1	13	< 0.0010	---	**< 0.00010 [#1]**	**< 0.000085 [#1]**	**< 0.000075 [#1]**	**< 0.00010 [#1]**	**0.0037 [#1]**	**0.06 [#1]**	**0.0057 [#1]**	**0.00022 [#1]**
B38-N-OBS-62	19-Aug-2012	**7.1 [#1]**	**4 [#1]**	**0.75 [#1]**	3.4	4.4	1.0	---	---	---	---	---	---	---	---	---	---
	06-Jul-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH									
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		0.37	0.002	0.09	---	---	---	0.0058	0.0044	0.000012	0.000018	0.000015	0.00004	0.003	0.0011	0.0004	0.000025
B38X-N-OBS26	01-Oct-2001	15 [#1]	7.5 [#1]	0.72 [#1]	3.3	---	---	< 0.0070 [#1]	0.0048 [#1]	< 0.00037 [#1]	< 0.00010 [#1]	< 0.00010 [#1]	< 0.00010 [#1]	0.012 [#1]	0.12 [#1]	0.016 [#1]	< 0.00037 [#1]
B38X-N-OBS27	01-Oct-2001	10.5 [#1]	8.5 [#1]	0.7 [#1]	3.8	---	---	---	---	---	---	---	---	---	---	---	---
B38X-N-OBS7	01-Oct-2001	29 [#1]	27 [#1]	2.6 [#1]	12	---	---	< 0.080 [#1]	0.064 [#1]	< 0.0039 [#1]	< 0.0036 [#1]	< 0.0010 [#1]	< 0.0085 [#1]	0.13 [#1]	0.86 [#1]	0.24 [#1]	< 0.013 [#1]
B38X-OBS1	03-Aug-2000	6.2 [#1]	2 [#1]	0.62 [#1]	2.2	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS10	03-Aug-2000	12 [#1]	0.88 [#1]	0.76 [#1]	2.5	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS11	03-Aug-2000	11 [#1]	0.58 [#1]	0.72 [#1]	2.4	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS12	23-Aug-2004	10.3 [#1]	< 0.0500 [#1]	0.536 [#1]	1.24	1.4	61.0	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2004	10 [#1]	< 0.0500 [#1]	0.521 [#1]	1.24	9.3	14.6	---	---	---	---	---	---	---	---	---	---
B38X-OBS2	28-Jul-1999	9.9 [#1]	0.91 [#1]	0.43 [#1]	2.4	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS4	28-Jul-1999	9.7 [#1]	0.6 [#1]	0.24 [#1]	1.9	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS5	28-Jul-1999	4.9 [#1]	0.14 [#1]	0.31 [#1]	1.4	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS6	28-Jul-1999	0.02	0.0013	0.0012	0.0042	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS8	03-Aug-2000	11 [#1]	0.16 [#1]	0.75 [#1]	2.4	---	---	---	---	---	---	---	---	---	---	---	---
B38X-OBS9	03-Aug-2000	9 [#1]	1.1 [#1]	0.78 [#1]	2.4	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	6.48 [#1]	0.0701 [#1]	0.325 [#1]	1.23	< 0.1	180	---	---	---	---	---	---	---	---	---	---
FTA 00-7-5	17-Sep-2000	8.6 [#1]	3.5 [#1]	0.39 [#1]	1.6	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Sep-2000	9 [#1]	3.8 [#1]	0.44 [#1]	1.8	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	3.4 [#1]	0.55 [#1]	0.098 [#1]	0.97	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	11.2 [#1]	0.682 [#1]	0.22 [#1]	2.06	---	---	---	---	---	---	---	---	---	---	---	---
FTA 00-8-5	17-Sep-2000	7 [#1]	8.9 [#1]	0.81 [#1]	3.5	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	5 [#1]	4.6 [#1]	0.53 [#1]	2.97	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2002	4.4 [#1]	2.8 [#1]	0.42 [#1]	2.4	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	3.68 [#1]	0.474 [#1]	0.141 [#1]	1.92	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	3.64 [#1]	0.0706 [#1]	0.0769	2.516	0.8	1.4	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	1.49 [#1]	< 0.05 [#1]	< 0.05	1.29	3.9	1.0	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	1.3 [#1]	< 0.005 [#1]	< 0.005	1.04	2.9	0.9	---	---	---	---	---	---	---	---	---	---
	21-Aug-2007	3.57 [#1]	0.0221 [#1]	< 0.0004	0.585	3.77	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2009	1.5 [#1]	0.0050 [#1]	0.0025	0.22	9.6	1.7	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	0.69 [#1]	0.0024 [#1]	0.011	0.055	3.9	1.7	---	---	---	---	---	---	---	---	---	---

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH									
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)	Acenaphthene (mg/L)	Acridine (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
FTA 00-9-5	20-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	8.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	18-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
FTA 98-4-5	27-Aug-2001	**28** [#1]	**18** [#1]	**< 1** [#1]	(2.6-3.6)	---	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	**17** [#1]	**16** [#1]	**2.3** [#1]	12	240	240	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	**24** [#1]	**17** [#1]	**0.67** [#1]	9.6	110	21	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**15** [#1]	**9.2** [#1]	**0.47** [#1]	5.6	< 0.1	13	---	---	---	---	---	---	---	---	---	---
	13-Aug-2017	**14** [#1]	**8.5** [#1]	**0.22** [#1]	6.9	< 0.10	11	---	---	---	---	---	---	---	---	---	---
(Duplicate)	13-Aug-2017	**14** [#1]	**8.2** [#1]	**0.22** [#1]	6.3	< 0.10	13	---	---	---	---	---	---	---	---	---	---
FTA 99-2-4	26-Aug-2001	**31** [#1]	**22** [#1]	**1.1** [#1]	5.4	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	**20.6** [#1]	**15.1** [#1]	**0.704** [#1]	4.48	< 0.1	6.3	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	**18** [#1]	**12** [#1]	**0.72** [#1]	5.9	3.2	7.0	---	---	---	---	---	---	---	---	---	---
	22-Aug-2010	**20** [#1]	**9** [#1]	**0.25** [#1]	5	13	17.6	---	---	---	---	---	---	---	---	---	---
	18-Aug-2011	**21** [#1]	**10** [#1]	**0.36** [#1]	5.7	28	27	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	**15** [#1]	**16** [#1]	**1.1** [#1]	32	< 0.1	120	---	---	---	---	---	---	---	---	---	---
	31-Jul-2014	**12** [#1]	**6.5** [#1]	**0.14** [#1]	4.3	5.4	7.2	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**4.3** [#1]	**2** [#1]	0.029	1.8	2.3	7.3	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**5.6** [#1]	**1.6** [#1]	0.069	2	< 0.1	15	---	---	---	---	---	---	---	---	---	---
FTA 99-3-4	18-Oct-1999	**1.6** [#1]	**2.9** [#1]	**0.47** [#1]	1.7	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**1.2** [#1]	**2.9** [#1]	**0.55** [#1]	2.5	---	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2001	0.2	**0.59** [#1]	**0.23** [#1]	1.07	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2002	0.061	**0.031** [#1]	0.016	0.28	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	0.22	**0.0227** [#1]	0.0065	0.289	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2003	0.199	**0.0265** [#1]	0.0076	0.303	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	**0.781** [#1]	**0.659** [#1]	**0.159** [#1]	1.26	7.8	12.4	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.0222	**0.292** [#1]	**0.0982** [#1]	0.753	3.3	6.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	0.185	**0.0780** [#1]	< 0.0005	0.281	5.25	8.2	---	---	---	---	---	---	---	---	---	---
	21-Aug-2007	**0.745** [#1]	**0.197** [#1]	0.0065	0.602	21.6	3.5	---	---	---	---	---	---	---	---	---	---
	18-Aug-2008	**0.97** [#1]	**0.16** [#1]	0.02	0.44	6.2	3.9	---	---	---	---	---	---	---	---	---	---

Table 4

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	PHC: Toluene (mg/L)	PHC: Ethylbenzene (mg/L)	PHC: Xylenes (Total) (mg/L)	PHC: PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC: PHC F2 (C_{10}-C_{16}) (mg/L)	PAH: Acenaphthene (mg/L)	PAH: Acridine (mg/L)	PAH: Anthracene (mg/L)	PAH: Benzo(a)Anthracene (mg/L)	PAH: Benzo(a)Pyrene (mg/L)	PAH: Fluoranthene (mg/L)	PAH: Fluorene (mg/L)	PAH: Naphthalene (mg/L)	PAH: Phenanthrene (mg/L)	PAH: Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
FTA 99-3-4 (cont)	19-Aug-2009	0.12	**0.032 [#1]**	0.0080	0.19	9.7	8.9	---	---	---	---	---	---	---	---	---	---
	20-Aug-2010	0.14	**0.015 [#1]**	0.0049	0.063	3.7	7.8	---	---	---	---	---	---	---	---	---	---
	18-Aug-2011	0.094	**0.03 [#1]**	0.0090	0.043	1.6	4.4	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	**0.41 [#1]**	**0.044 [#1]**	0.011	0.067	16	11	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	**0.55 [#1]**	**0.032 [#1]**	0.017	0.042	2.3	12	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2013	**0.51 [#1]**	**0.028 [#1]**	0.01	0.048	2.9	22	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	0.22	**0.066 [#1]**	0.014	0.042	1.8	28	---	---	---	---	---	---	---	---	---	---
(Duplicate)	09-Aug-2015	0.21	**0.066 [#1]**	0.014	0.045	2.1	23	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	0.17	**0.027 [#1]**	0.024	0.05	1.3	10	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Aug-2016	0.16	**0.028 [#1]**	0.024	0.053	1	8.4	---	---	---	---	---	---	---	---	---	---
	10-Sep-2016	0.31	**0.14 [#1]**	0.039	0.094	0.47	21	0.00012	---	**0.000083 [#1]**	0.000013	< 0.0000075	0.000022	0.00064	**0.0011 [#1]**	0.00036	**0.00014 [#1]**
	17-Aug-2017	**0.38 [#1]**	**0.088 [#1]**	0.026	0.069	3.4	6.8	---	---	---	---	---	---	---	---	---	---
FTA 99-5-6	18-Oct-1999	**0.77 [#1]**	**0.36 [#1]**	0.082	0.59	---	---	---	---	---	---	---	---	---	---	---	---
	17-Sep-2000	**3.9 [#1]**	**1.5 [#1]**	**0.27 [#1]**	1.6	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2002	**3.4 [#1]**	**0.65 [#1]**	**0.27 [#1]**	1.9	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2002	**3.6 [#1]**	**0.68 [#1]**	**0.27 [#1]**	1.8	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	**5.86 [#1]**	**1.53 [#1]**	**0.289 [#1]**	2.50	---	---	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	**4.03 [#1]**	**0.575 [#1]**	**0.441 [#1]**	3.02	< 0.1	6.2	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	**1.4 [#1]**	**0.08 [#1]**	**0.26 [#1]**	1.7	15	54	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	**3 [#1]**	**0.012 [#1]**	**0.19 [#1]**	1.4	< 0.1	46	---	---	---	---	---	---	---	---	---	---
FTA 99-6-12	25-Aug-2003	0.0019	0.0012	< 0.0005	0.0043	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2004	0.0010	0.0008	0.0013	0.0077	< 0.1	0.5	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2004	0.0011	0.0009	0.0013	0.0086	0.3	< 0.1	---	---	---	---	---	---	---	---	---	---
	25-Aug-2005	0.0006	< 0.0005	0.0006	0.0051	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2005	0.0007	< 0.0005	0.0006	0.0042	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	0.3	---	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	0.1	---	---	---	---	---	---	---	---	---	---
	20-Aug-2007	0.0013	< 0.0004	< 0.0004	0.0041	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Aug-2007	< 0.0004	< 0.0004	0.0029	0.0026	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---	---
	19-Aug-2008	< 0.0004	< 0.0004	0.0007	0.0047	< 0.1	2.3	---	---	---	---	---	---	---	---	---	---
	20-Aug-2012	0.0084	< 0.00040	0.0023	0.043	1.1	1.6	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**2.4 [#1]**	**0.0038 [#1]**	**0.38 [#1]**	1.7	5.9	65	---	---	---	---	---	---	---	---	---	---
	10-Sep-2016	**3.1 [#1]**	**0.0061 [#1]**	**0.49 [#1]**	2.2	14	140	0.0029	---	**0.00057 [#1]**	**0.000092 [#1]**	0.000014	**0.00018 [#1]**	**0.022 [#1]**	**0.15 [#1]**	**0.025 [#1]**	**0.0010 [#1]**
(Duplicate)	10-Sep-2016	**5.1 [#1]**	**0.0063 [#1]**	**0.41 [#1]**	1.8	0.64	77	0.0020	---	**0.00021 [#1]**	**0.000072 [#1]**	< 0.0000075	**0.00018 [#1]**	**0.018 [#1]**	**0.13 [#1]**	**0.021 [#1]**	**0.00086 [#1]**
	13-Aug-2017	**3.0 [#1]**	**0.0035 [#1]**	0.081	1.5	2.5	31	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	PHC: Toluene (mg/L)	PHC: Ethylbenzene (mg/L)	PHC: Xylenes (Total) (mg/L)	PHC: PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC: PHC F2 (C_{10}-C_{16}) (mg/L)	PAH: Acenaphthene (mg/L)	PAH: Acridine (mg/L)	PAH: Anthracene (mg/L)	PAH: Benzo(a)Anthracene (mg/L)	PAH: Benzo(a)Pyrene (mg/L)	PAH: Fluoranthene (mg/L)	PAH: Fluorene (mg/L)	PAH: Naphthalene (mg/L)	PAH: Phenanthrene (mg/L)	PAH: Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.0044**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
FTA-OBS-56	20-Aug-2012	**7.3** [#1]	**3.5** [#1]	**0.5** [#1]	1.8	2.9	0.36	---	---	---	---	---	---	---	---	---	---
	06-Jul-2016	**4.7** [#1]	**1.1** [#1]	0.073	2.1	2.9	6.2	0.00014	---	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	0.0011	**0.016** [#1]	**0.0015** [#1]	**0.000075** [#1]
FTA-OBS-58	20-Aug-2012	**0.52** [#1]	**0.85** [#1]	**0.14** [#1]	1.1	5.1	1.7	---	---	---	---	---	---	---	---	---	---
	06-Jul-2016	**7.2** [#1]	**3.9** [#1]	**0.39** [#1]	2.5	1.9	7.6	**< 0.01** [#1]	---	**< 0.0010** [#1]	**< 0.00085** [#1]	**< 0.00075** [#1]	**< 0.0010** [#1]	**0.022** [#1]	**0.11** [#1]	**0.042** [#1]	**0.0025** [#1]
FTA-OBS14	01-Oct-2001	**6.6** [#1]	**0.088** [#1]	< 0.05	< 0.05	---	---	0.0011	< 0.00068	**0.00006** [#1]	< 0.00001	< 0.00001	< 0.00001	0.0018	**0.062** [#1]	**0.0030** [#1]	**< 0.00005** [#1]
	23-Aug-2004	**3.13** [#1]	**0.204** [#1]	< 0.0500	0.358	0.2	820	---	---	---	---	---	---	---	---	---	---
	06-Jul-2016	0.35	0.00089	0.0075	0.027	12	460	**0.031** [#1]	---	**< 0.0010** [#1]	**< 0.00085** [#1]	**< 0.00075** [#1]	**0.0029** [#1]	**0.28** [#1]	**0.54** [#1]	**0.44** [#1]	**0.015** [#1]
FTA-OBS16	01-Oct-2001	**1.5** [#1]	**0.014** [#1]	< 0.01	0.071	---	---	< 0.00013	< 0.00005	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00048	**0.016** [#1]	0.00023	< 0.00001

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Appendix 8 Conceptual Site Model: Mainland Sumps



Imperial

Conceptual Site Model

Mainland Sumps (APECs MS-1, MS-2, and MS-3), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0001

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0001 - Conceptual Site Model: Mainland Sumps (APECs MS-1, MS-2, and MS-3), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	R. Reader	M. Brown	S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 1

Figures

Figure 1 Site Location Map

Figure 2 Historical Air Photo 1993

Figure 3 Site Plan Showing Topography

Figure 4A Site Plan Showing Soil Sampling Locations

Figure 4B Site Plan Showing Groundwater Sampling Locations

Figure 4C Historical Excavation Site Plans Showing Sampling Locations

Figure 5A Site Plan 3-D Visualization

Figure 5B Cross Section A-A' (Southwest to Northeast)

Figure 5C Cross Section B-B' (West to East)

Figure 6A Site Plan Showing Soil Electrical Conductivity Analytical Results

Figure 6B Historical Excavation Site Plans Showing Soil Electrical Conductivity Analytical Results

Figure 6C Site Plan Showing Soil Petroleum Hydrocarbon Analytical Results

Figure 6D Historical Excavation Site Plans Showing Soil Petroleum Hydrocarbon Analytical Results

Figure 7 Site Plan Showing Groundwater and Surface Water Chloride Analytical Results (2017)

Figure 8 Conceptual Site Model

Figure 9 Conceptual Exposure Model Flow Chart

Tables

Table 1 Soil Analytical Results: Inorganic Parameters

Table 2 Soil Analytical Results: Organic Parameters

Table 3 Water Analytical Results: Inorganic Parameters

Table 4 Water Analytical Results: Total Metals

Table 5 Water Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE	
Site Description:	Mainland Drilling Sump: drilling waste (MDS, APEC MS-1) Well Services Sump: well servicing waste (WSS, APEC MS-2) Northern Sumps: drilling waste (Sumps 1 through 6, APEC MS-3). Mainland Sumps have been backfilled, remediated, and/or capped. No other surrounding infrastructure.
Current Land Use:	CCME Industrial land use
Future Land Use:	CCME Industrial land use
HISTORICAL LAND USE	
Infrastructure type:	Sumps (Figure 2)
Notes:	Used for storage/disposal of drilling and well servicing wastes
Years Active:	Northern Sumps: pre-1982 to approximately 1990. Mainland Drilling Sump: pre-1993 to 2007. Well Services Sump: pre-1992 to 2007.
SITE SETTING	
Topography and Drainage:	Topography in the vicinity of the Mainland Sumps is generally flat. The overall slope and drainage on the Mainland is generally toward the Mackenzie River flood plain. See Figures 3 and 5A.
Nearby Surface Water Bodies (Distance and Direction):	Wetlands (100 m to the north and 150 m to the south). Seepage Lake and sewage lagoon (500 m to the east-northeast) Bosworth Creek (800 m to the southeast) Mackenzie River (1000 m to the south)
SOIL AND GROUNDWATER CONDITIONS	
Surficial Materials:	Silty clay and sandy silt, with occasional sand lenses (see Figures 5A/B/C).
Presence of Permafrost:	Discontinuous in the vicinity of the Sumps, but interpreted to be present to the east, south, and west of the Site underlying undisturbed and vegetated areas.
Depth to Bedrock:	~ 1 to 3 mbgs on the undisturbed boundaries of the site. Up to 4.5 mbgs in the footprint of the sumps where excavated.

Bedrock Lithology:	Interbedded siltstone and shale
Number of Groundwater-Bearing Zones (GBZs):	2 (based on different geochemistry within surficial sediments and shallow bedrock).
Number of Piezometers:	37 current, 9 historical now destroyed/decommissioned.
Free Product in Surficial GBZ:	not encountered
Free Product in Shallow Bedrock GBZ:	not encountered

First Groundwater-Bearing Zone

Primary Soil Type/Lithology:	Unconsolidated silty clay and sandy silt, with occasional sand lenses.
Dominant Grain Size:	Fine
Depth to Groundwater Surface:	~ 0.5 to 2 mbgs
Hydraulic Conductivity (Minimum):	3.3×10^{-7} m/s
Hydraulic Conductivity (Maximum):	7.1×10^{-6} m/s
Hydraulic Conductivity (Geometric Mean K):	7.7×10^{-7} m/s
Vertical Hydraulic Gradient:	Not assessed (underlain by discontinuous permafrost in the surficial sediments and shallow bedrock).
Lateral Hydraulic Gradient (I):	Poorly defined, not estimated (due to discontinuous permafrost, frequent frost jacking of monitoring wells resulting in survey errors).
Groundwater Flow Direction and Velocity:	Groundwater flow is interpreted to be relatively stagnant in the vicinity of the Mainland Sumps, with no apparent or consistent pattern to hydraulic heads. Some localized shallow flow towards the southwest in the WSS area. The Mainland Sumps are interpreted to be surrounded by shallow permafrost to the east, west, and south, as well as permafrost under the sumps. This permafrost barrier is interpreted to hydraulically isolate the Site.

Shallow Bedrock Groundwater-Bearing Zone:

Primary Soil Type/Lithology:	Interbedded siltstone and shale
Dominant Grain Size:	Fine
Depth to Groundwater Surface:	~ 1 to 2 mbgs
Hydraulic Conductivity (Minimum):	3.8×10^{-8} m/s
Hydraulic Conductivity (Maximum):	1.7×10^{-5} m/s
Hydraulic Conductivity (Geometric Mean K):	7.7×10^{-7} m/s

Vertical Hydraulic Gradient:	Not assessed (underlain by discontinuous permafrost in the surficial sediments and shallow bedrock).
Lateral Hydraulic Gradient (I):	Not estimated (due to discontinuous permafrost and stagnant groundwater conditions, see discussion above).
Groundwater Flow Direction and Velocity:	Groundwater flow is interpreted to be relatively stagnant in the vicinity of the Mainland Sumps. Permafrost underlying and surrounding the sumps area is inferred to hydraulically isolate the Site.

HISTORICAL ENVIRONMENTAL ACTIVITIES

Soil, groundwater, and surface water characterization (pre-1997 to present) (Figures 4 A/B/C)
Remedial excavation and reclamation of the MDS (~470 m^3) and WSS (~2,653 m^3) (2007 to 2009)
Closure monitoring of the MDS and WSS (2010 to present)
Vegetation and biophysical assessment (2011)
Sump management activities (i.e. fluid removal, backfilling, and capping - 2012 to present)
Geophysical surveys (1998, 2005, 2008, 2013)
Screening level risk assessment (2013)
Sump management strategy developed (2015)

CURRENT STATUS

Remaining soil and groundwater impacts (Figures 6A/B/C/D and 7, Tables 1 through 5).

Sources and Impacts

SOURCES

Historical Sources:	Drilling waste (i.e. drilling mud and returns) and well servicing waste within the Sumps.
Current Sources:	Remaining sump material (primary source) and impacted soil (secondary source).

KNOWN ENVIRONMENTAL CONCERNS

a. Soil

Potential Contaminants of Concern:	Petroleum hydrocarbons (PHCs), salinity, metals, PAHs.
Proven Contaminants of Concern:	PHCs - benzene, PHC F1 to F4 in part due to natural seepage and shallow bedrock. Limited salinity - electrical conductivity (primarily driven by chloride) - in part due to natural seepage and shallow bedrock.

	Metals in part due to natural seepage and shallow bedrock Polycyclic Aromatic Hydrocarbons (PAHs) in part due to natural seepage and shallow bedrock.
Delineation:	Localized salinity impacts are laterally delineated, but have not been delineated vertically into bedrock (Figures 6A/B and Table 1). PHC impacts associated with the Mainland Sumps have been delineated laterally and generally vertically (Figures 6C/D and Table 2). Confirmatory samples from the MDS and WSS excavations indicate that residual impacts may be present in bedrock underlying those sumps.
b. Groundwater	
Potential Contaminants of Concern:	PHCs, salinity, metals, phenols, PAHs
Proven Contaminants of Concern:	PHCs - toluene (surface water only), PHC F2 (groundwater only). Limited salinity - chloride Metals & Phenols As noted with soils, some of the PHC, salinity, metals and phenols issues in groundwater and surface water are attributed in part to natural seepage and shallow bedrock.
Presence of Free Product:	No free phase identified in the vicinity of the Mainland Sumps.
Delineation:	Lateral delineation of the chloride plume is partially achieved to the north and west (Figure 7 and Table 3). Above-guideline chloride extends to the south and west, however the Mainland Sumps are interpreted to be surrounded by shallow permafrost to the east, west, and south, which may hydraulically isolate the Site. Chloride in groundwater has not been delineated vertically as it extends into bedrock. Some of the chloride is attributed to natural background conditions in upper bedrock.

Migration Pathways and Receptors

MIGRATION PATHWAYS

Summarized in Figure 8 and 9.

Potential pathways include leaching from soil to groundwater, lateral migration in groundwater, discharge to surface water, shallow vapour migration in soil, water and wind erosion.

RECEPTORS

Summarized in Figures 8 and 9.

Main receptor of interest is the wetland/lake located north of the Site, in relation to human, wildlife and freshwater aquatic life receptors. Plants and soil invertebrates may also be receptors in the rooting zone of shallow soils.

EXPOSURE PATHWAYS

Summarized on Figures 8 and 9

Synopsis of Conceptual Risk

In terms of soil related exposure pathways, the remedial excavations and reclamation of the MDS and WSS Sumps (2007 to 2009), combined with various sumps 1 to 6 management activities (i.e. fluid removal, backfilling, and capping - 2012 to present) have reduced conceptual risk. Some residual soil impacts exceeding guidelines remain in place. Risks related to potential exposure pathways for human, ecological, microbial and wildlife contact or ingestion have been reduced, but not eliminated. Capping with clean soils, and contouring to enhance runoff and prevent surface water accumulation directly above the sumps has reduced potential exposure scenarios for freshwater aquatic life, wildlife, and vegetation.

In terms of groundwater related exposure pathways, chloride and phenols are two parameters of interest which can be partially attributed to sump contents, although naturally-occurring concentrations are also elevated above the applied guidelines in the local shallow bedrock. Groundwater flow appears to be relatively stagnant in the area, confined by permafrost laterally and vertically. As such the exposure scenarios related to wildlife watering and freshwater aquatic life at the water body to the north would be considered complete but inactive. In terms of groundwater consumption, the exposure scenario is incomplete for both humans and wildlife. Human drinking water is sourced locally from the Mackenzie River upstream of this site, and is treated by the Town of Norman Wells before use.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

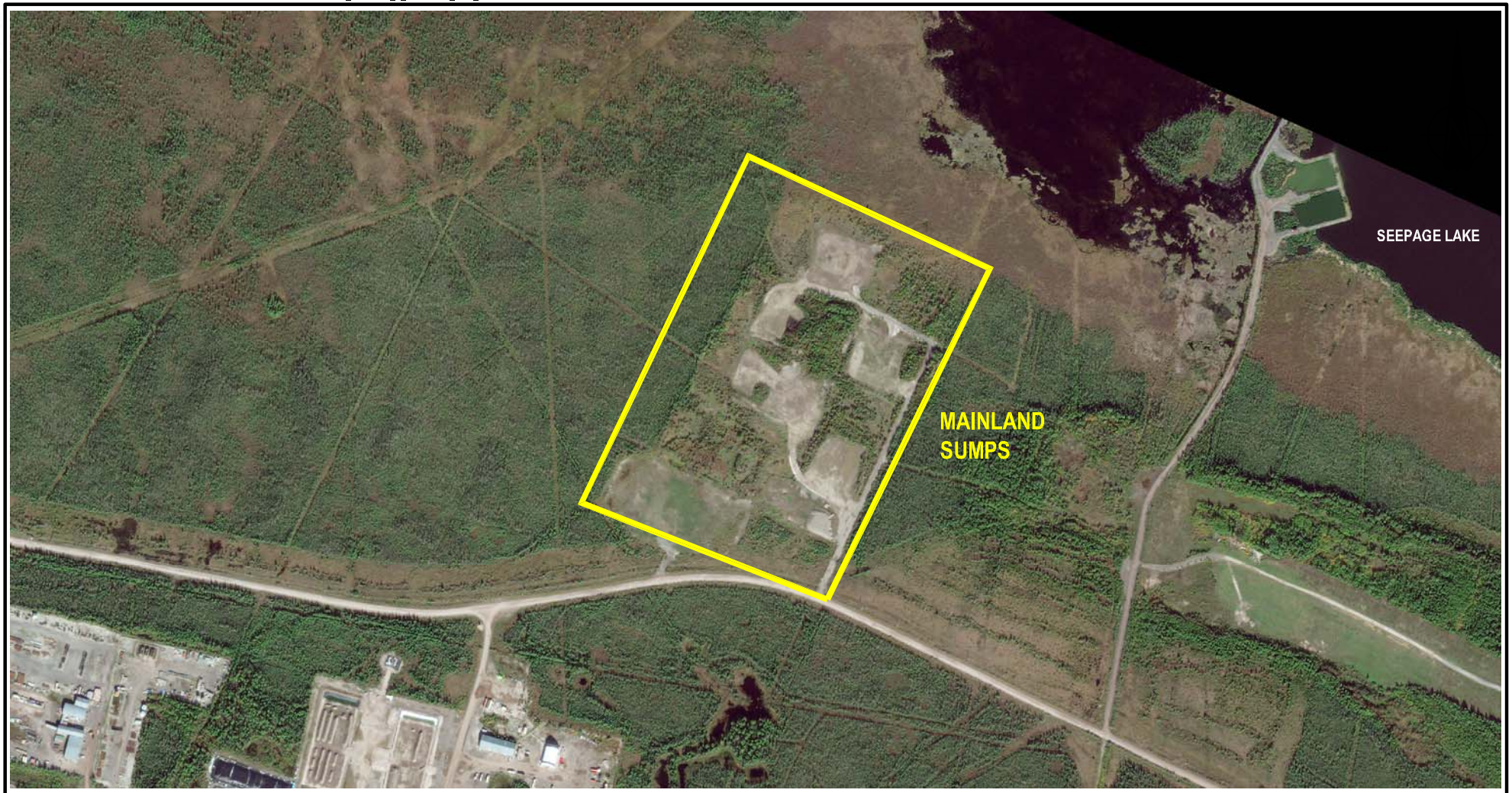
If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 400 m

1:8000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	11-MAY-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 1

REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 12:50:20 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 12:14:31 PM ISSUING OFFICE: eCAD



m 0 50 100 200 m

1:4000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1993

OneWay to zero harm

Advisian WorleyParsons Group

Date:	Drawn by:	Edited by:	App'd by:
17-APR-18	BMF	-	MB

WorleyParsons Project No.
407011-00622-400

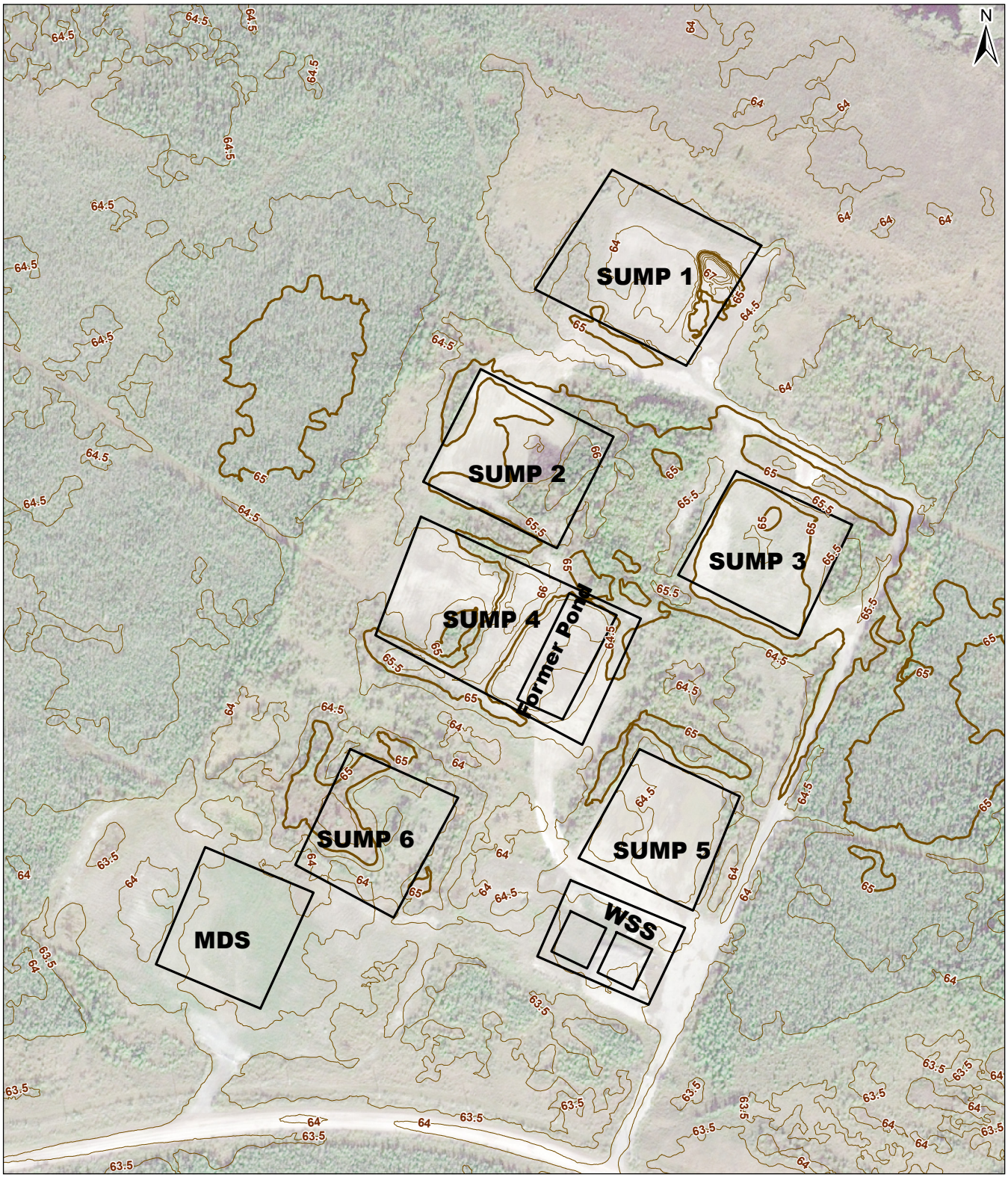
FIG No 2

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 4/5/2018 1:30:18 PM
SAVE DATE & TIME: 18/4/2018 2:51:08 PM
USER NAME: blan.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-AIRPHOTO1993.DWG



Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 50 100
Metres
1:3,000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	30-MAY-18	Drawn by:	T.G.	Edited by:	T.G.	App'd by:	D.G.

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

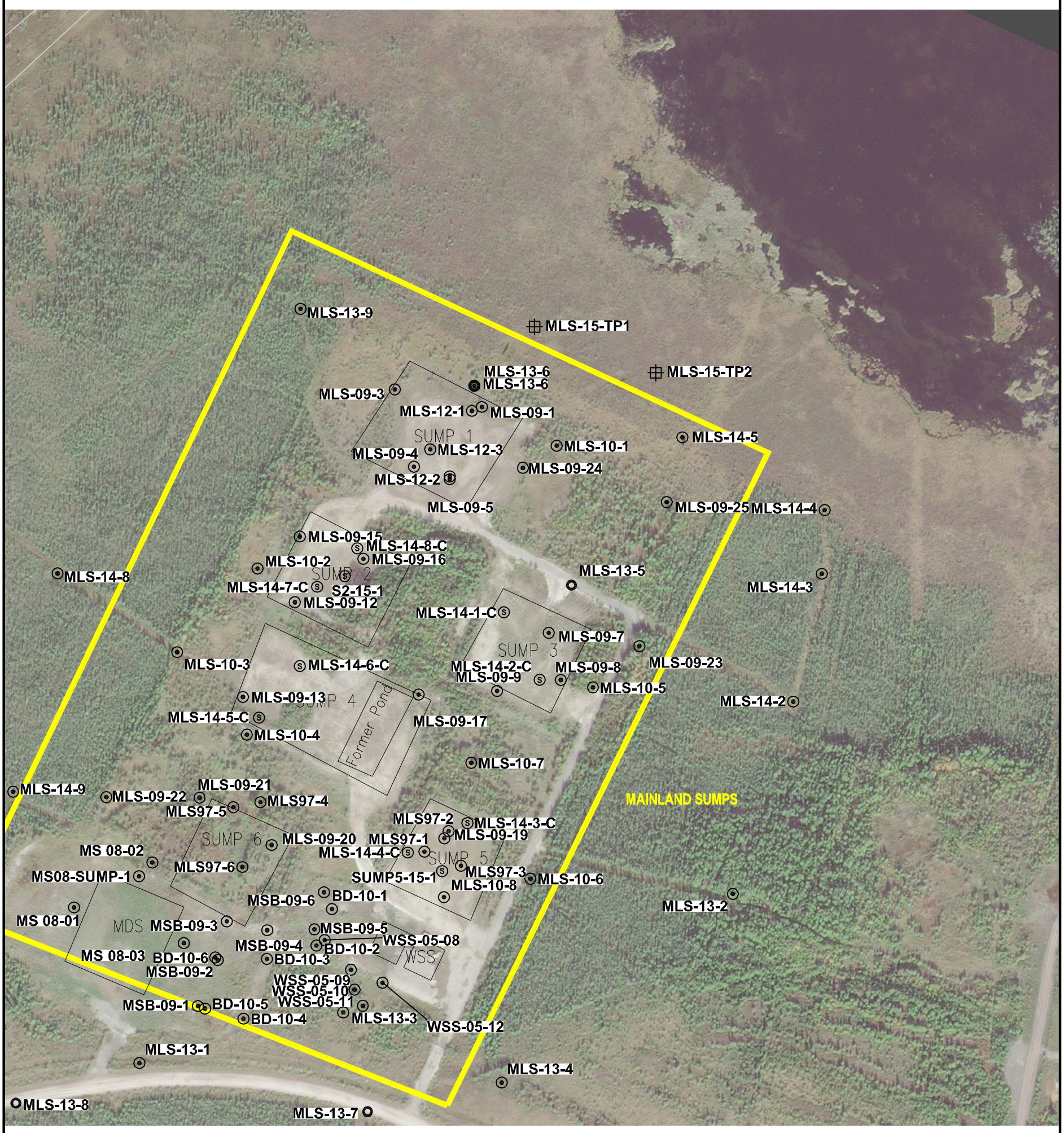
FIG No 3

REV 0

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:50:47 PM
USER NAME: Tom.Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\Mainland Sumps\MainlandSumps_Topography_Rev0.mxd



LEGEND

- SOIL SAMPLING LOCATION
- SUMP CONTENT SAMPLING LOCATION
- TEST PIT LOCATION
- THERMISTOR LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 50 100 150 m

1:3000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING SOIL SAMPLING LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

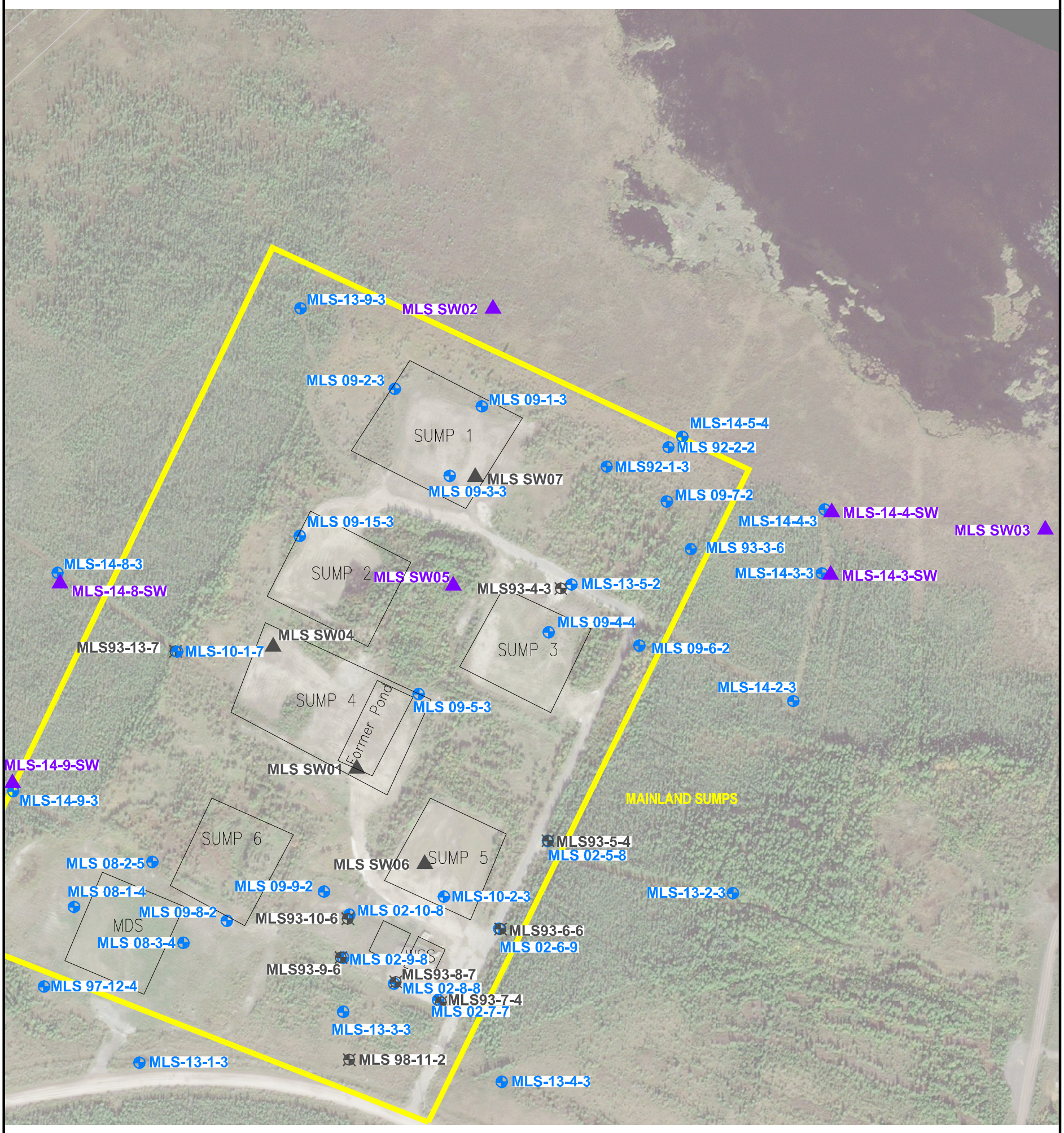
FIG No 4A

REV C

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG

PLOT DATE & TIME: 16/5/2018 11:18:41 AM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 10:57:15 AM ISSUING OFFICE: CALGARY



LEGEND

- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- FORMER SURFACE WATER SAMPLE LOCATION (BACKFILLED)

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 50 100 150 m

1:3000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING GROUNDWATER SAMPLING LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

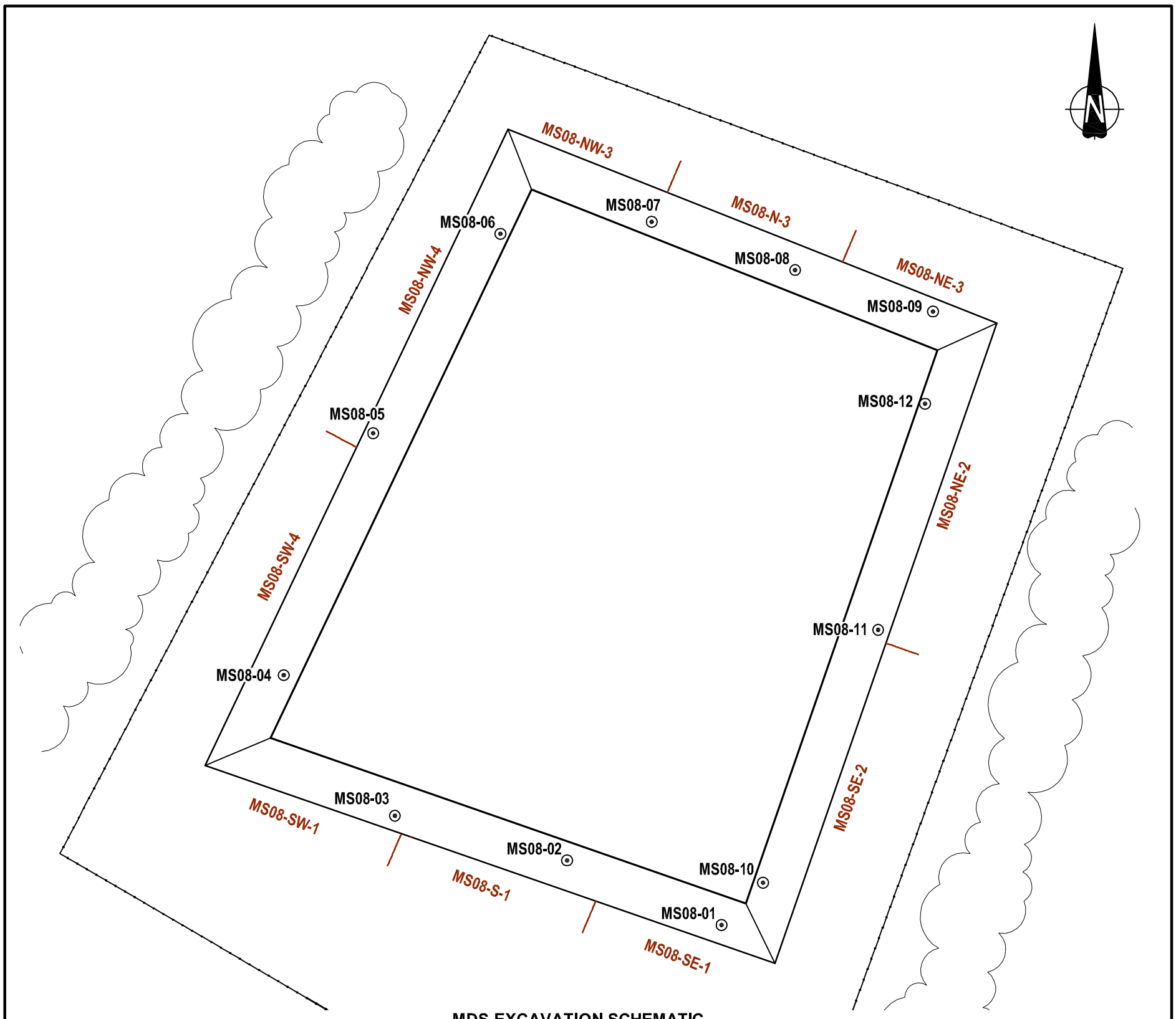
WorleyParsons Project No.
407011-00622-400

FIG No 4B | REV C

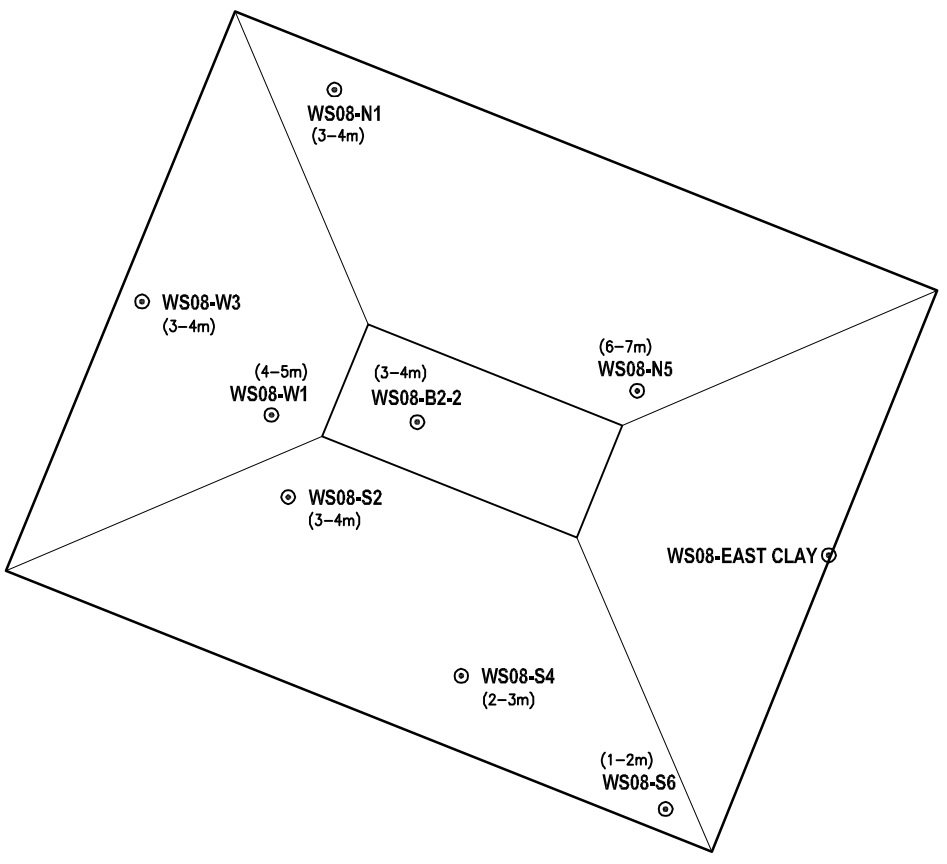
"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 1:09:25 PM USER NAME: blair.link
SAVE DATE & TIME: 18/5/2018 12:01:59 PM ISSUING OFFICE: CALGARY

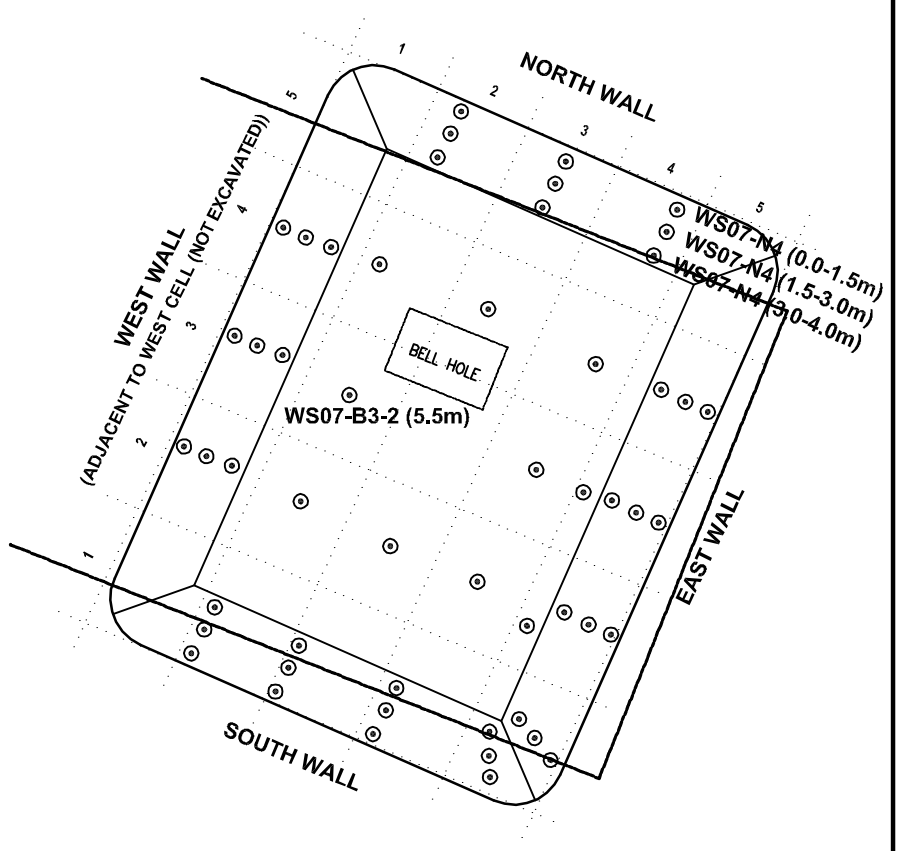
FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG



MDS EXCAVATION SCHEMATIC
SCALE: 1:500



WSS WEST CELL EXCAVATION SCHEMATIC
SCALE: 1:250



WSS EAST CELL EXCAVATION SCHEMATIC
SCALE: 1:300

LEGEND

⊙ SOIL SAMPLING LOCATION

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

HISTORICAL EXCAVATION
SITE PLANS SHOWING SAMPLING LOCATIONS

Date:	12-MAY-18	Drawn by:	OTHERS	Edited by:	BMF	App'd by:	MB

Advisian
WorleyParsons Group

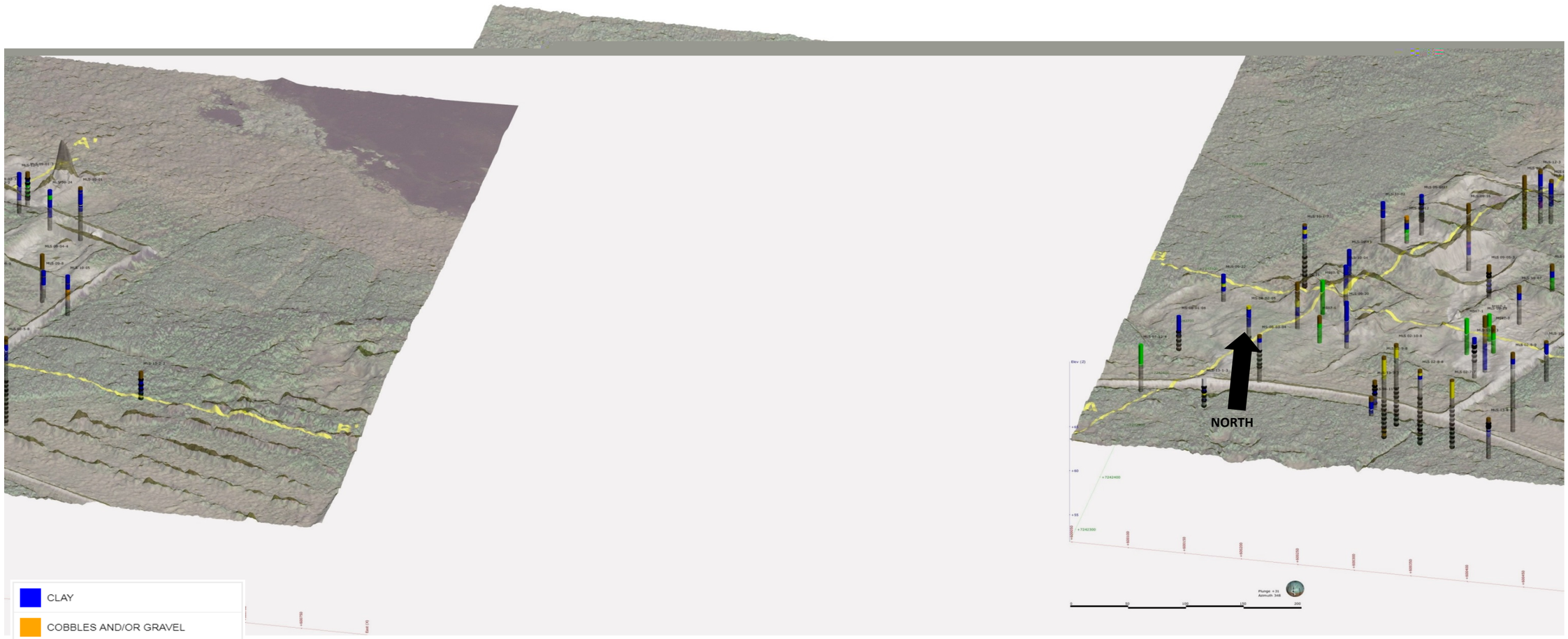
WorleyParsons Project No.
407011-00622-400

FIG No: 4C
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-MLS_HISTORICALEXCAVATIONS.DWG

PLOT DATE & TIME: 16/5/2018 12:19 PM USER NAME: blair.link
SAVE DATE & TIME: 16/5/2018 11:47:27 AM ISSUING OFFICE: CALGARY



IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	AM	RR	MB

OneWay to zero harm

Advision
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

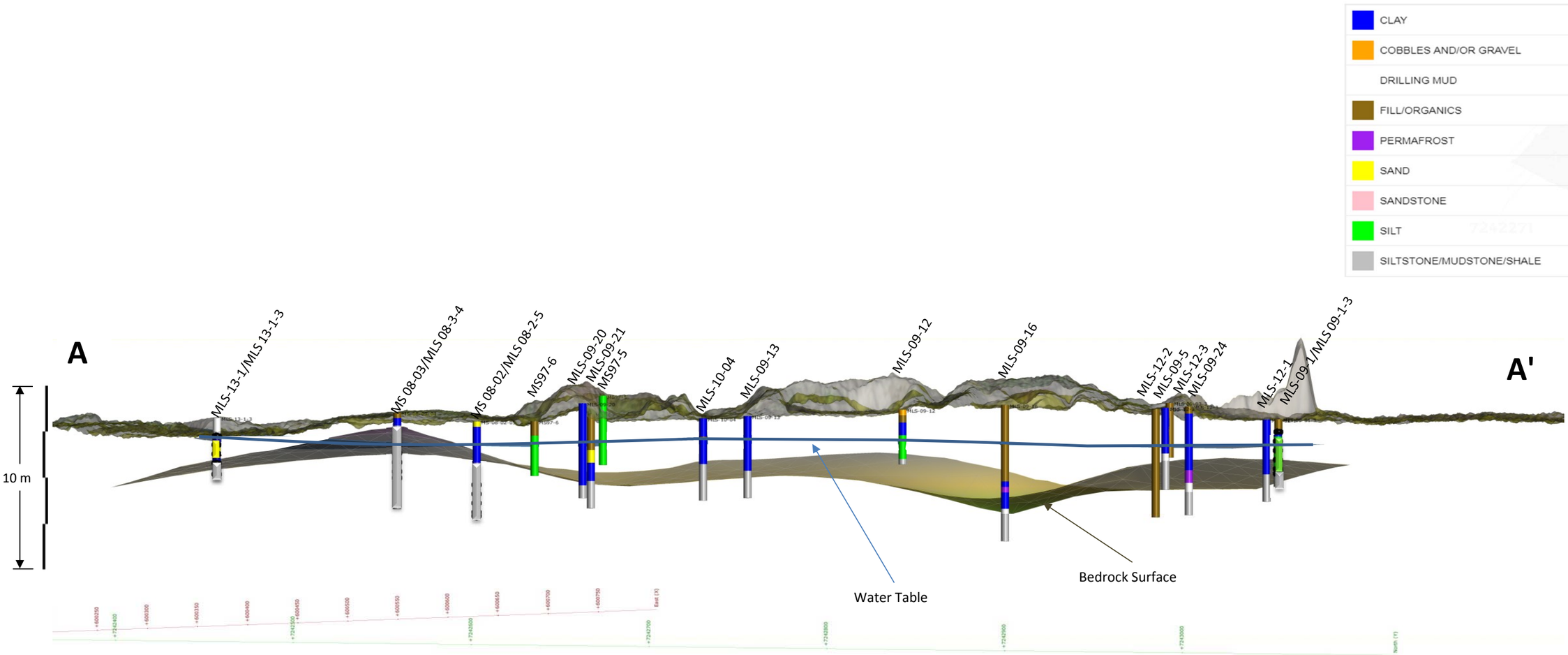
FIG No. 5A

REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALIGBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\MLS





Notes: 1) 10x Vertical Exaggeration
2) Cross-section width is 20 m.

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

CROSS SECTION A-A'
(SOUTHWEST TO NORTHEAST)

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	AM	RR	MB

WorleyParsons Project No.
407011-00622-400

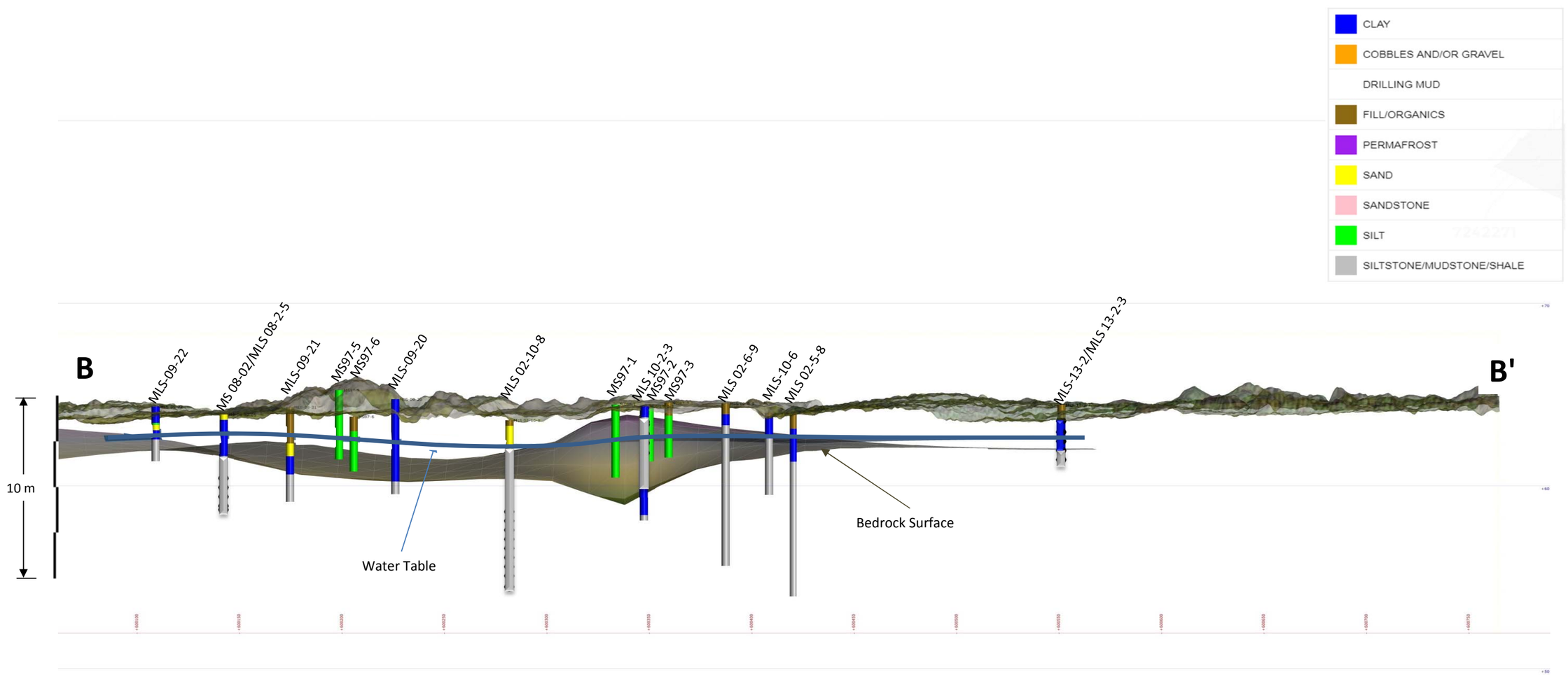
FIG No. 5B
REV A

OneWay to zero harm
Advision WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\MLS





Notes: 1) 10x Vertical Exaggeration
2) Cross-section width is 20 m.

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

CROSS SECTION B-B'
(WEST TO EAST)

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	AM	RR	MB

WorleyParsons Project No.: 407011-00622-400

FIG No.: 5C

REV: A

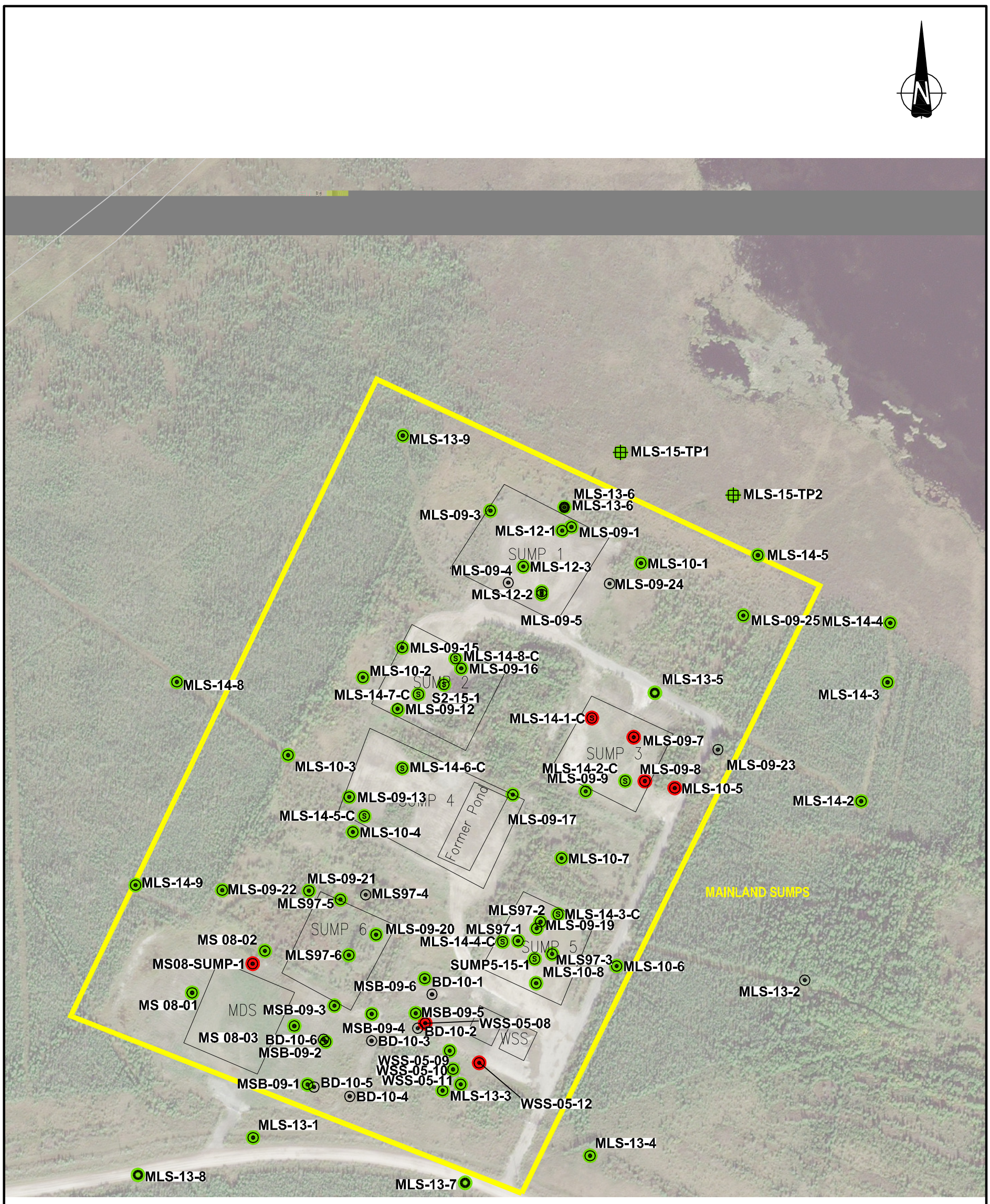
OneWay™ to zero harm

Advision
WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\MLS



LEGEND

- SOIL SAMPLING LOCATION
- SUMP CONTENT SAMPLING LOCATION
- TEST PIT LOCATION
- THERMISTOR LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET THE GUIDELINE, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED THE GUIDELINE, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 50 100 150 m

1:3000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING
SOIL ELECTRICAL CONDUCTIVITY ANALYTICAL RESULTS

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	

Advisian
WorleyParsons Group

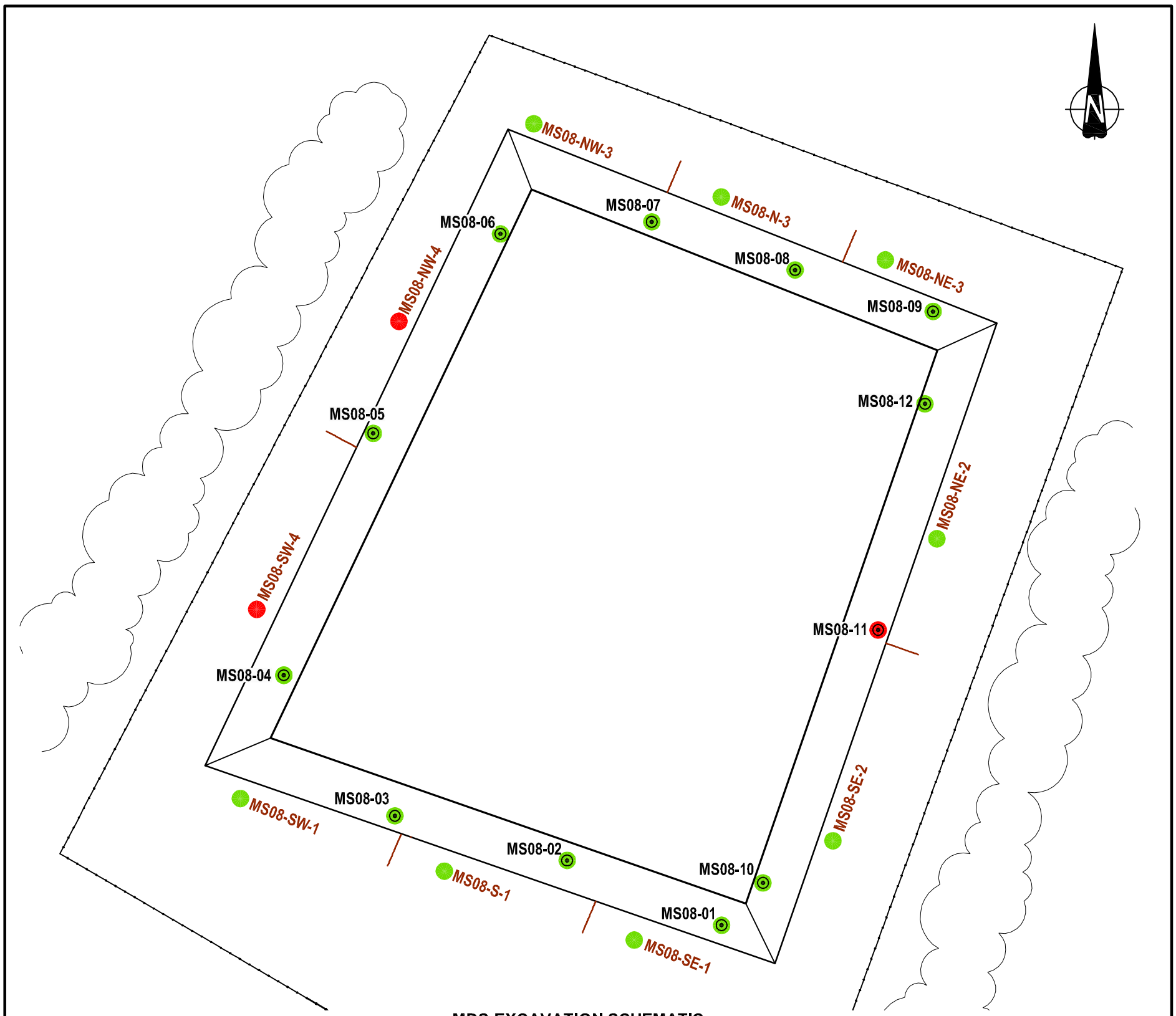
WorleyParsons Project No. 407011-00622-400

FIG No 6A | REV A

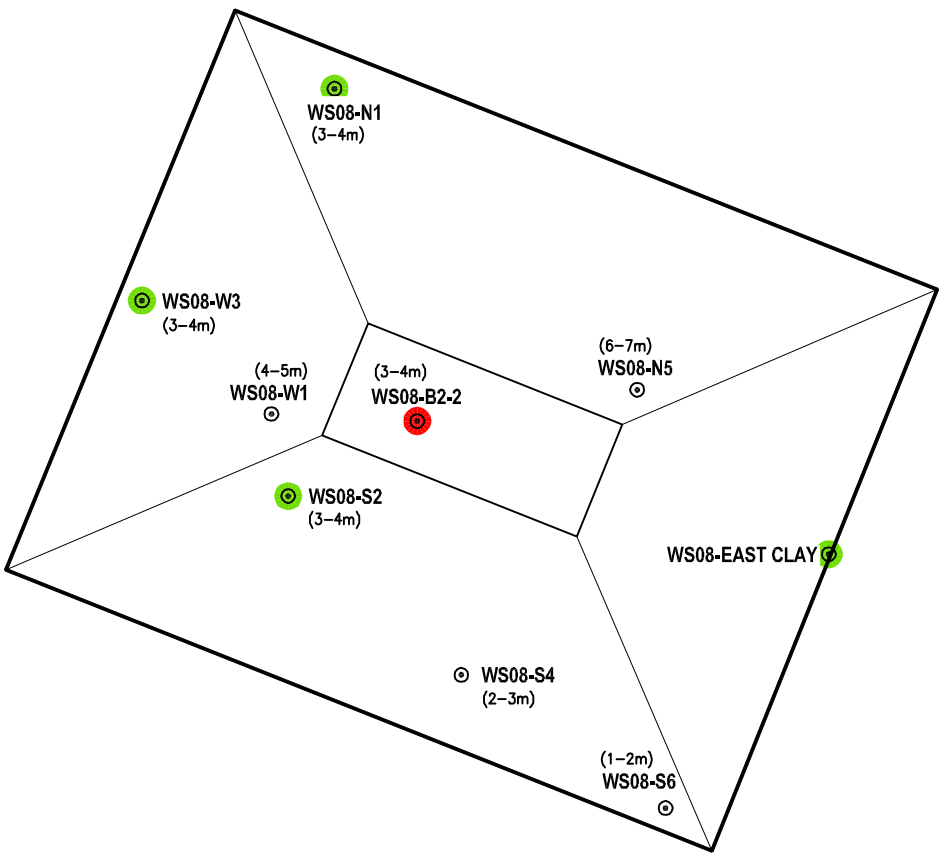
"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 1:13:15 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 1:12:33 PM ISSUING OFFICE: CALGARY

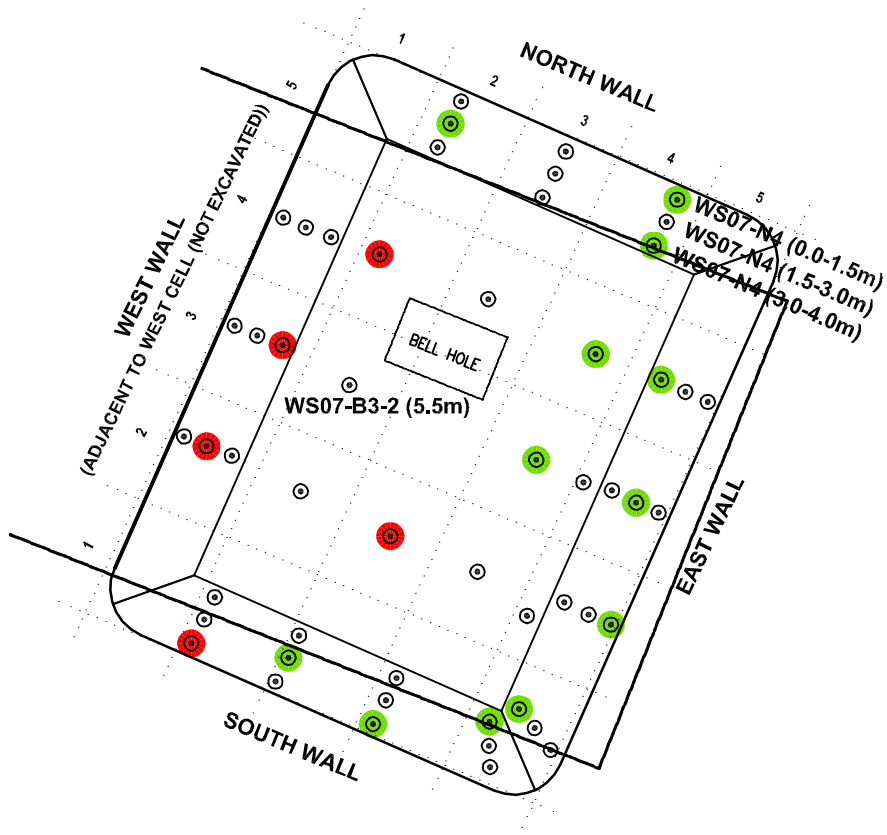
FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG



MDS EXCAVATION SCHEMATIC
SCALE: 1:500



WSS WEST CELL EXCAVATION SCHEMATIC
SCALE: 1:250



WSS EAST CELL EXCAVATION SCHEMATIC
SCALE: 1:300

LEGEND

SOIL SAMPLING LOCATION

ANALYTICAL RESULTS

LOCATION WHERE ALL SOIL SAMPLES MET THE GUIDELINE, SHOWN IN GREEN.

LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED THE GUIDELINE, SHOWN IN RED

LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

HISTORICAL EXCAVATION SITE PLANS SHOWING ELECTRICAL CONDUCTIVITY ANALYTICAL RESULTS

Date:	Drawn by:	Edited by:	App'd by:
12-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

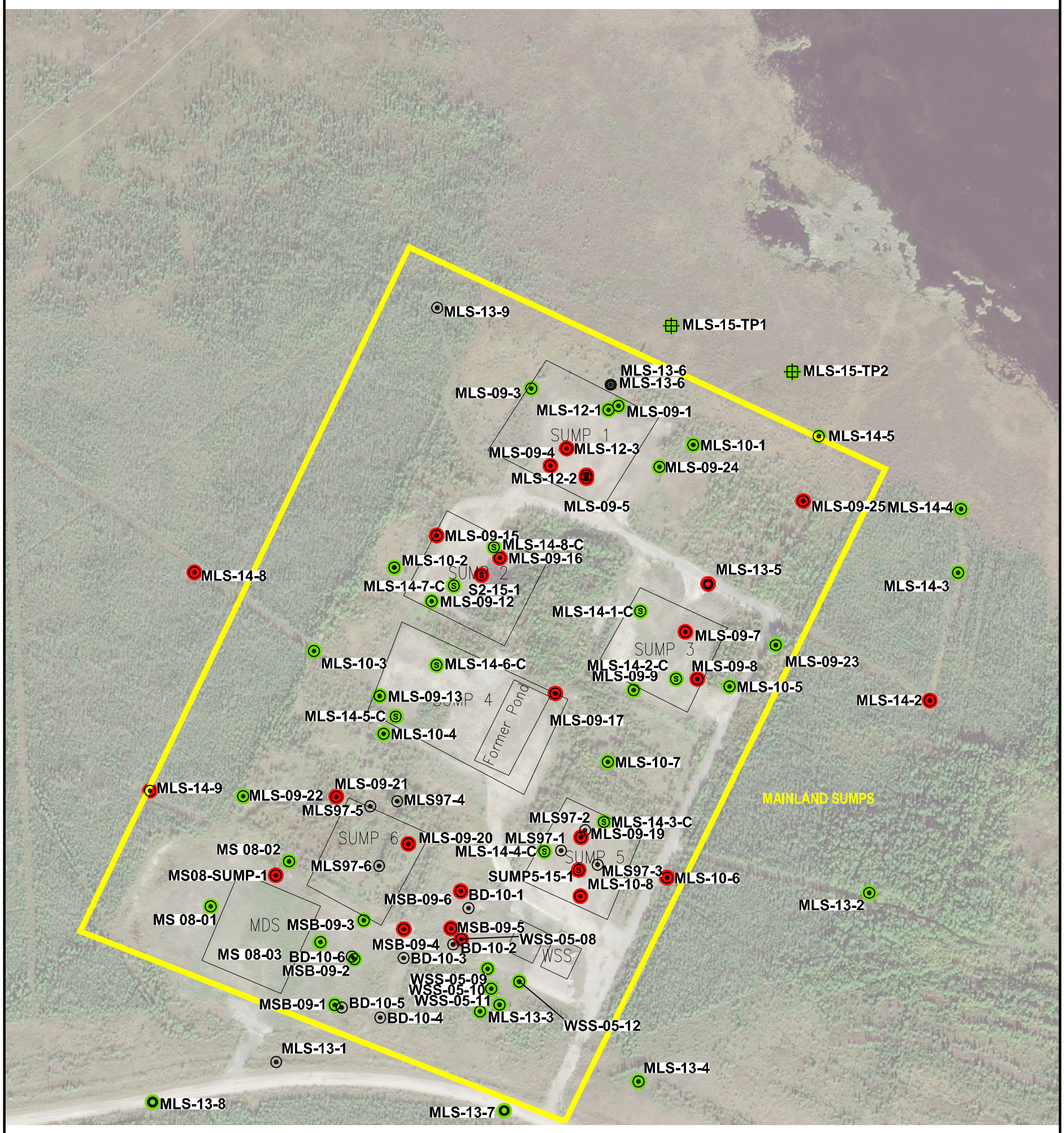
WorleyParsons Project No.
407011-00622-400

FIG No: 6B
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 1:21:58 PM
SAVE DATE & TIME: 16/5/2018 11:47:27 AM
USER NAME: blairlink
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-MLS_HISTORICALEXCAVATIONS.DWG



LEGEND

- SOIL SAMPLING LOCATION
- SUMP CONTENT SAMPLING LOCATION
- TEST PIT LOCATION
- THERMISTOR LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 50 100 150 m

1:3000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING
SOIL PETROLEUM HYDROCARBON ANALYTICAL RESULTS

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

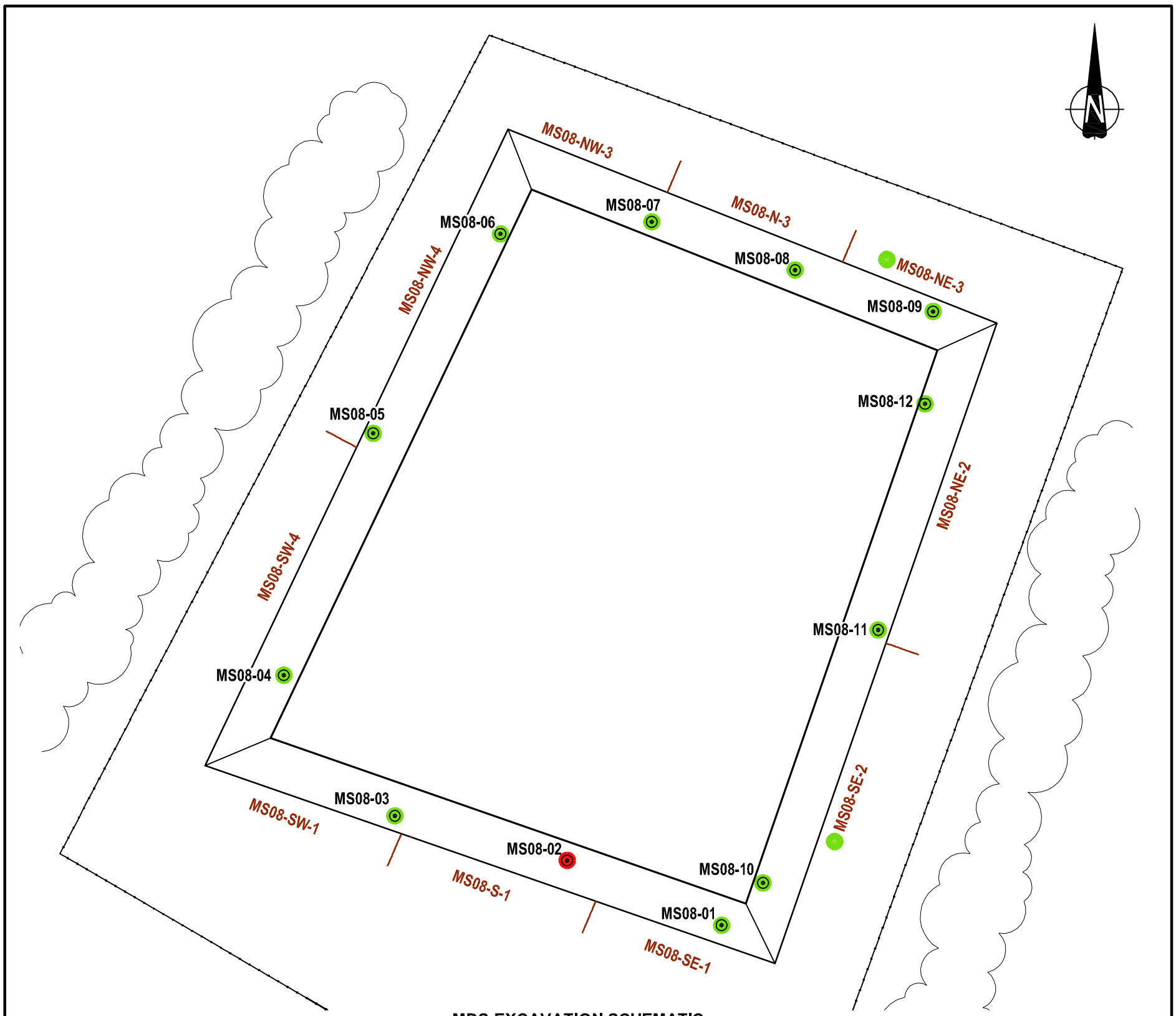
WorleyParsons Project No.
407011-00622-400

FIG No: 6C
REV: A

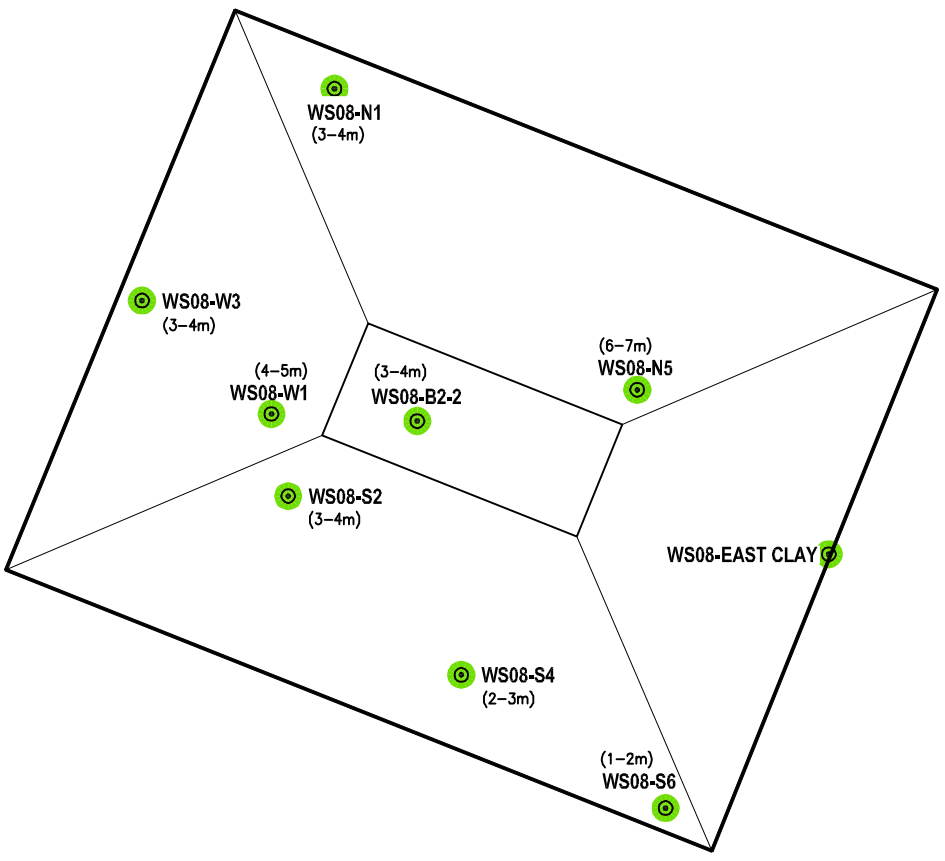
"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 1:14:06 PM
SAVE DATE & TIME: 16/5/2018 1:12:33 PM
USER NAME: blairlink
ISSUING OFFICE: CALGARY

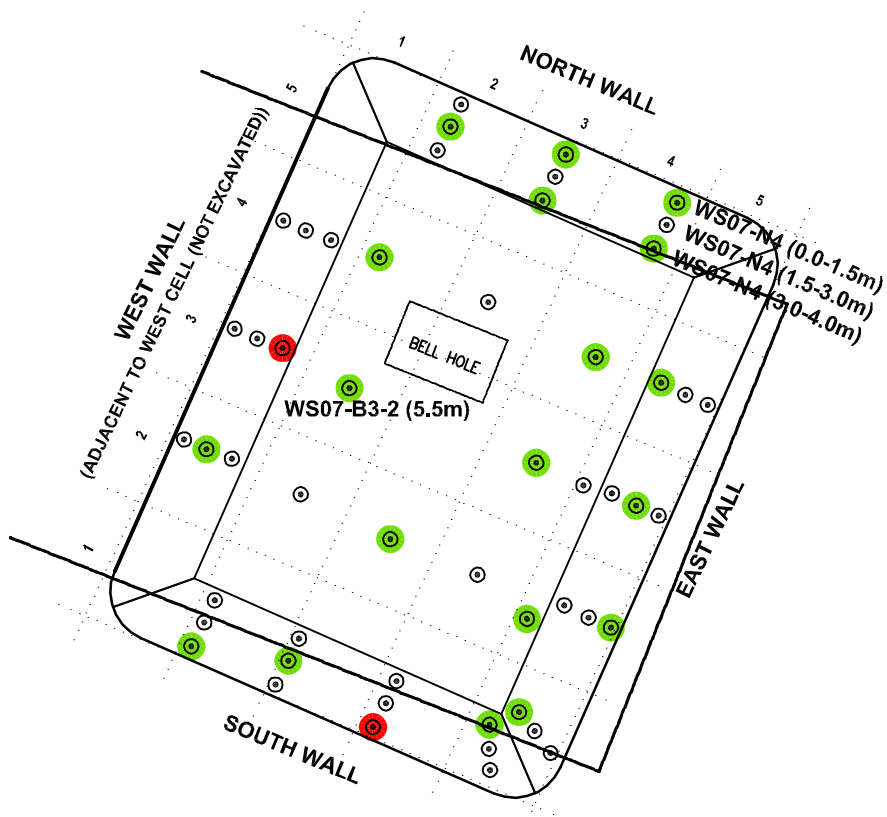
FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG



MDS EXCAVATION SCHEMATIC
SCALE: 1:500



WSS WEST CELL EXCAVATION SCHEMATIC
SCALE: 1:250



WSS EAST CELL EXCAVATION SCHEMATIC
SCALE: 1:300

LEGEND

SOIL SAMPLING LOCATION

ANALYTICAL RESULTS

LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.

LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

HISTORICAL EXCAVATION SITE PLANS SHOWING PETROLEUM HYDROCARBON ANALYTICAL RESULTS

Date:	Drawn by:	Edited by:	App'd by:
12-MAY-18	OTHERS	BMF	MB

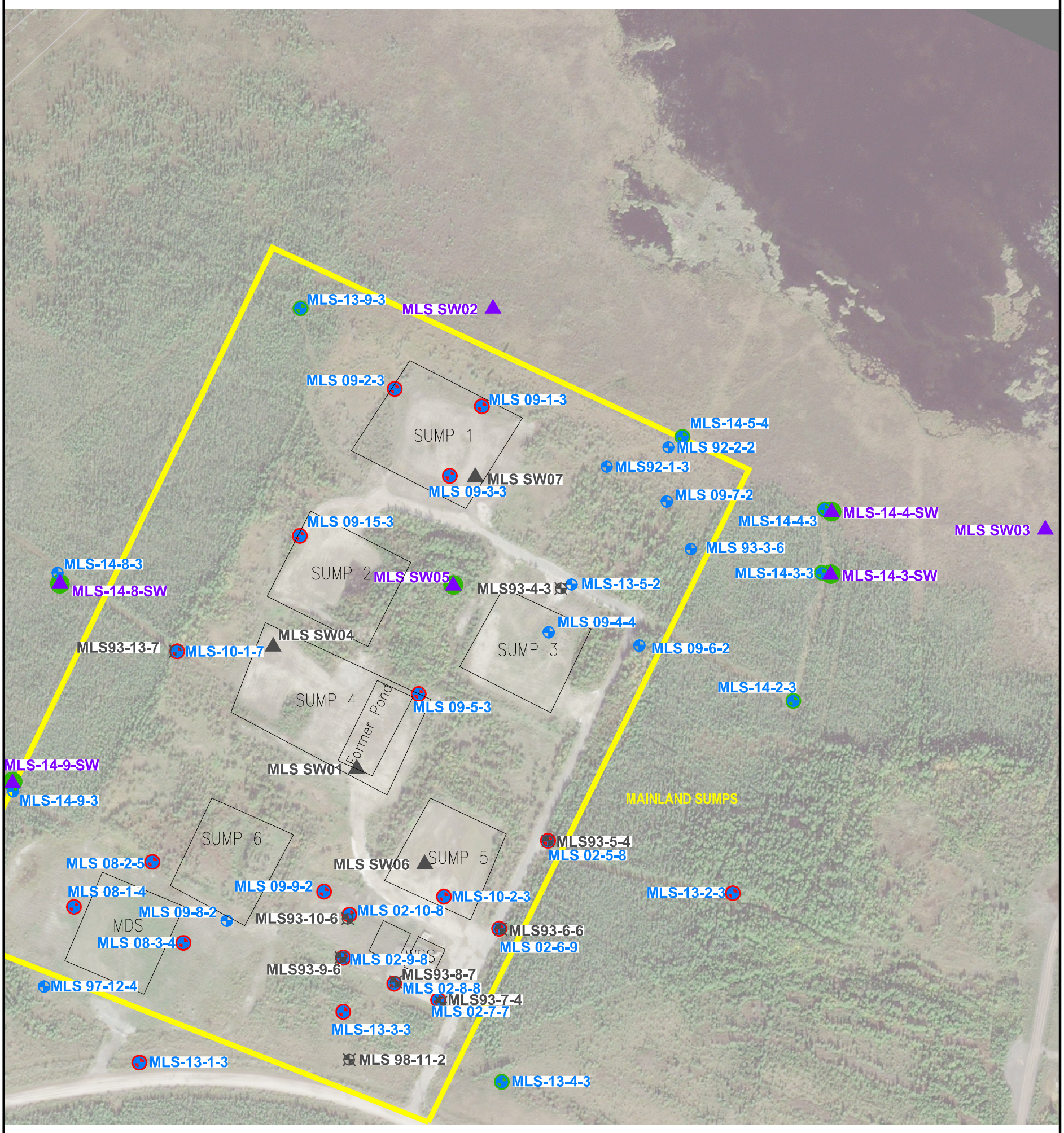
Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No: 6D
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 1:22:44 PM
SAVE DATE & TIME: 16/5/2018 11:47:27 AM
USER NAME: blairlink
ISSUING OFFICE: CALGARY
FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-MLS_HISTORICALEXCAVATIONS.DWG



LEGEND

- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- FORMER SURFACE WATER SAMPLE LOCATION (BACKFILLED)

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET THE GUIDELINE, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED THE GUIDELINE, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014.

m 0 50 100 150 m

1:3000

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING GROUNDWATER AND SURFACE WATER CHLORIDE ANALYTICAL RESULTS (2017)

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

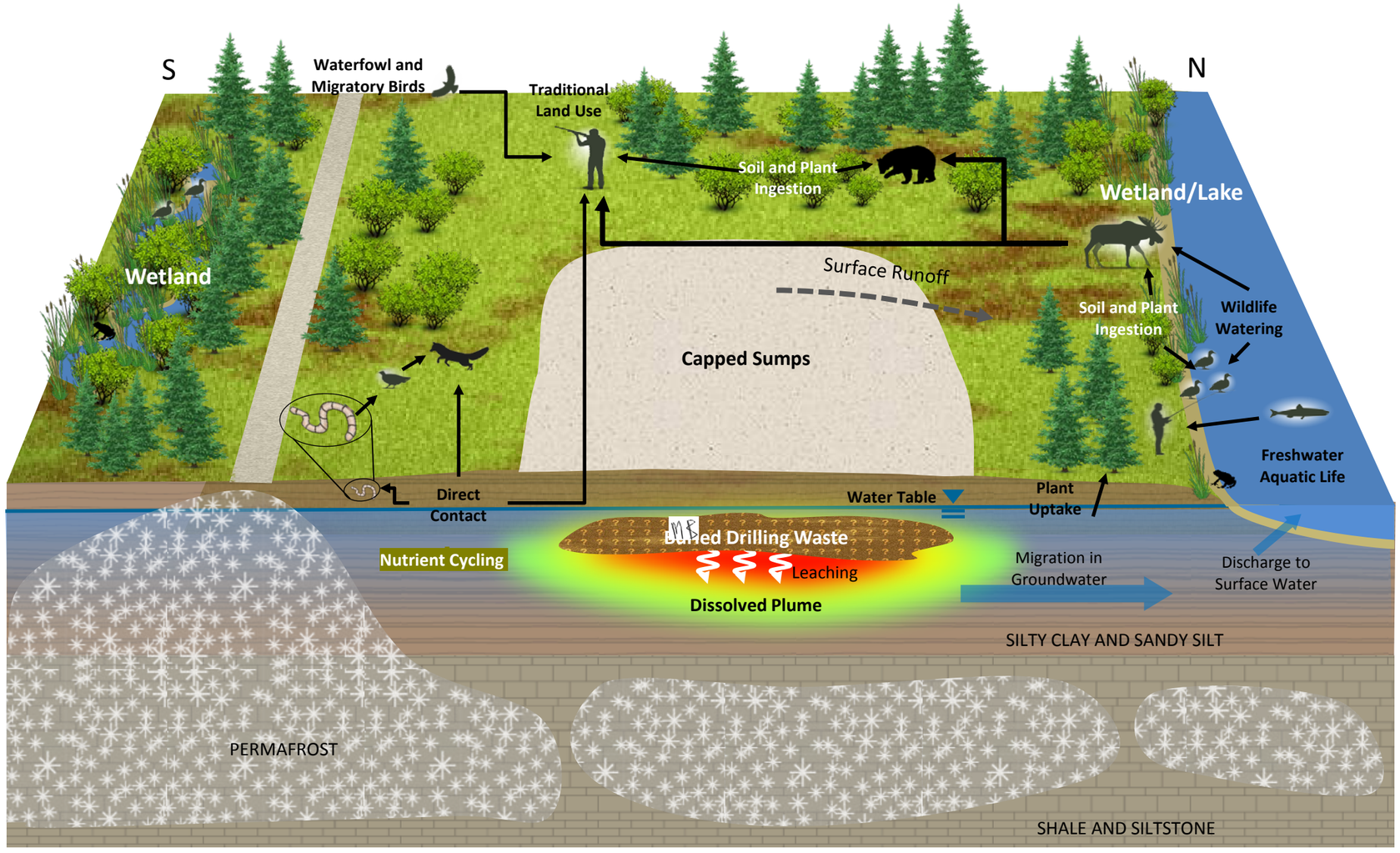
WorleyParsons Project No. 407011-00622-400

FIG No 7 | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 18/5/2018 1:32:10 PM
SAVE DATE & TIME: 18/5/2018 1:17:27 PM
USER NAME: blair.link
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018_MAINLANDEAST.DWG



Health Canada, 2015. Conceptual Site Model Builder, Version 1.0. Developed by eSolutions Group Ltd. 2015.

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	RR		MB

OneWay to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622-400

FIG No.: 8

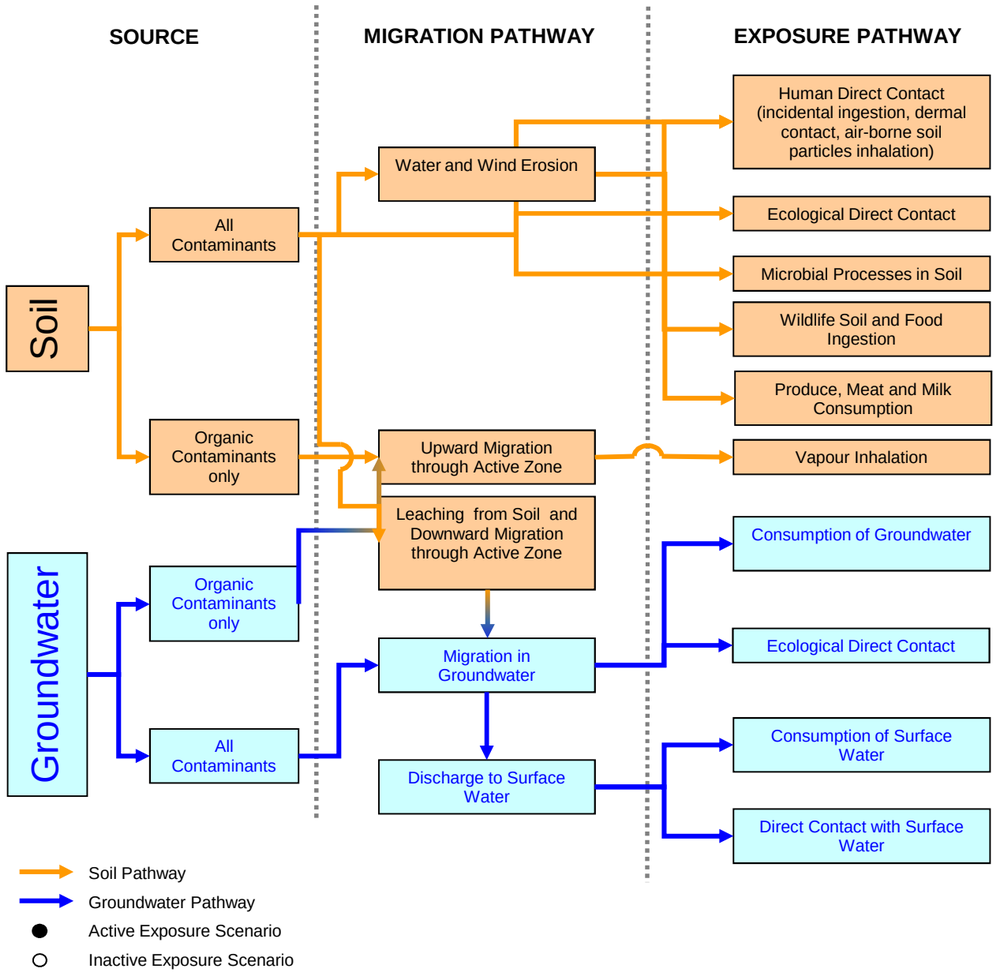
REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CA\DATA\CA\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\MLS

Mainland Sumps - Conceptual Exposure Model Flow Chart (Current Land Use and Site Conditions)



RECEPTORS

Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
●			
		●	
		●	
	●		
●[1]			
○			
		●	
○	●		
			●

Notes: 1) Although the current land use is industrial, it is recognized that due to the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site, and hunters are able to hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
MAINLAND SUMPS, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

OneWay™ to zero harm

Date: 16-May-18 | Drawn by: AH | Edited by: LG | App'd by: MB

Advision
WorleyParsons Group

WorleyParsons Project No. 407011-00622

FIG No. 9 | REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\MLS

Tables



Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Salinity: Soluble Chloride (mg/L)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**---**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
MS97-1	09-Aug-1997	2.3 - 3.3m	0.861	3.5	---	33.9	---	**22.6** [#1]	336	1.0	< 0.2	35.9	< 0.25	19.3	36.7	28	0.16	< 0.4	61.0	0.4	---	**< 2** [#1]	---	---	42.2	147
MS97-2	09-Aug-1997	2.3 - 3.0m	1.03	11.2	---	53.8	---	**15.1** [#1]	281	0.8	< 0.2	29.4	< 0.25	15.9	28.7	18	0.50	< 0.4	47.4	0.4	---	**< 2** [#1]	---	---	35.9	129
MS97-3	09-Aug-1997	2.3 - 3.0m	1.54	**14.1** [#1]	---	103	---	**19.5** [#1]	299	1.1	< 0.2	36.9	< 0.25	19.9	36.2	21	0.66	< 0.4	62.6	0.3	---	**< 2** [#1]	---	---	43.7	155
MS97-5	09-Aug-1997	2.3 - 3.5m	1.63	**19.3** [#1]	---	290	---	**18.7** [#1]	233	0.9	< 0.2	35.5	< 0.25	20.1	33.6	17	0.51	< 0.4	60.2	0.3	---	**< 2** [#1]	---	---	42.8	152
MS97-6	09-Aug-1997	2.3 - 3.0m	0.786	10.2	---	64.0	---	**21.5** [#1]	576	1.0	< 0.2	39.3	< 0.25	20.8	34.6	29	0.26	< 0.4	65.5	0.3	---	**< 2** [#1]	---	---	48.0	164
MLS-09-1	28-Jul-2009	0.1 - 0.4m	3.2	4.7	---	670	< 1	**12** [#1]	270	0.5	0.2	26	< 0.15	14	32	12	0.08	1.5	40	< 0.5	< 1	< 0.3	< 1	< 1	34	100
	28-Jul-2009	1.0 - 1.3m	3	3.1	---	790	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-3	28-Jul-2009	0.1 - 0.4m	1.1	3.8	---	200	< 1	9	250	0.4	0.4	22	< 0.15	9	20	9	0.06	1.9	28	0.6	< 1	< 0.3	< 1	1	27	75
	28-Jul-2009	1.0 - 1.3m	0.79	4.4	---	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-5	27-Jul-2009	0.1 - 0.4m	2.9	8.5	---	430	< 1	9	420	< 0.4	0.3	16	< 0.15	8	19	10	0.20	1.4	26	0.5	< 1	< 0.3	< 1	< 1	22	78
	27-Jul-2009	0.9 - 1.2m	1.3	10	---	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2009	2.4 - 2.7m	2.6	7.2	---	380	2	**15** [#1]	1100	0.5	0.9	25	< 0.15	12	38	560	0.26	6.6	45	1.5	< 1	**1.0** [#1]	< 1	2	31	310
MLS-09-7	28-Jul-2009	0.0 - 0.4m	**5.2** [#1]	2.1	---	1300	< 1	**15** [#1]	310	1.4	3.8	19	< 0.15	40	**91** [#1]	12	0.08	8.7	**230** [#1]	**7.9** [#1]	< 1	0.5	< 1	9	34	**600** [#1]
	28-Jul-2009	1.3 - 1.5m	**6.2** [#1]	5.5	---	1800	< 1	**14** [#1]	270	0.5	0.2	28	< 0.15	15	29	13	0.05	1.6	44	0.5	< 1	< 0.3	< 1	< 1	38	120
	28-Jul-2009	4.0 - 4.3m	**4.9** [#2]	**26** [#2]	---	1400	< 1	11	350	0.6	0.2	30	< 0.15	15	33	26	0.06	2.2	48	0.6	< 1	0.4	< 1	1	36	220
MLS-09-8	28-Jul-2009	0.8 - 1.1m	**4.2** [#1]	3.5	---	950	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-9	28-Jul-2009	1.1 - 1.4m	2.3	**16** [#1]	---	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-12	31-Jul-2009	0.3 - 0.7m	2.6	7.1	---	530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-13	31-Jul-2009	0.0 - 0.5m	2.6	3.8	---	420	< 1	**16** [#1]	300	1.1	4.2	20	< 0.15	44	90	11	0.10	11	**250** [#1]	**9.7** [#1]	< 1	0.6	< 1	8	35	**650** [#1]
MLS-09-15	31-Jul-2009	0.0 - 0.5m	0.39	1.6	---	14	< 1	**14** [#1]	270	0.7	1.2	33	< 0.15	22	41	13	0.08	2.1	**94** [#1]	1.8	< 1	< 0.3	< 1	2	41	220
	31-Jul-2009	1.3 - 1.5m	1.5	4.2	---	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-16	31-Jul-2009	0.0 - 0.5m	0.39	2.9	---	8	< 1	**16** [#1]	320	0.7	0.1	37	< 0.15	18	37	14	0.08	0.7	55	< 0.5	< 1	< 0.3	< 1	< 1	44	130
	31-Jul-2009	1.2 - 1.5m	2.6	4.9	---	570	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2009	3.0 - 3.3m	1.5	**29** [#2]	---	280	< 1	**13** [#2]	1800	0.6	0.2	35	< 0.15	15	33	31	0.09	1.6	48	< 0.5	< 1	< 0.3	< 1	< 1	41	160
MLS-09-17	29-Jul-2009	0.0 - 0.3m	0.33	1.4	---	7	< 1	**21** [#1]	270	0.6	< 0.1	36	< 0.15	19	35	13	< 0.05	< 0.4	54	< 0.5	< 1	< 0.3	< 1	< 1	46	130
MLS-09-19	29-Jul-2009	0.0 - 0.6m	2	6.7	---	130	< 1	**12** [#1]	330	0.6	0.4	24	< 0.15	12	24	12	< 0.05	1.4	35	1.0	< 1	< 0.3	< 1	1	36	97
	29-Jul-2009	2.7 - 3.0m	1.2	**17** [#1]	---	96	< 1	**20** [#1]	320	0.7	< 0.1	36	< 0.15	19	36	14	< 0.05	< 0.4	56	< 0.5	< 1	< 0.3	< 1	< 1	42	140
MLS-09-20	01-Aug-2009	0.0 - 0.3m	0.35	0.2	---	7	< 1	5	160	0.6	0.2	43	< 0.15	8	67	10	0.07	1.3	32	1.6	< 1	< 0.3	2	6	32	47
MLS-09-21	31-Jul-2009	0.0 - 0.5m	0.54	1.8	---	55	< 1	**12** [#1]	300	0.5	0.4	19	< 0.15	10	23	11	0.19	2.6	31	0.6	< 1	< 0.3	< 1	1	29	88
	31-Jul-2009	2.0 - 2.7m	3.1	**12** [#1]	---	530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-22	01-Aug-2009	0.0 - 0.4m	0.64	2.0	---	130	< 1	11	300	0.5	0.4	22	< 0.15	11	20	11	0.09	1.7	33	< 0.5	< 1	< 0.3	< 1	< 1	33	85

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity				Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Chloride (mg/L)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	---	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
MLS-09-25	29-Jul-2009	0.0 - 0.2m	1.2	3.4	---	130	< 1	11	310	0.6	0.4	29	< 0.15	11	20	12	< 0.05	1.8	34	0.6	< 1	< 0.3	< 1	< 1	35	87
	29-Jul-2009	0.8 - 1.1m	1.1	3.5	---	120	< 1	15 [#1]	240	0.5	0.3	28	< 0.15	10	22	11	< 0.05	2.1	34	< 0.5	< 1	< 0.3	< 1	< 1	29	88
MSB-09-1	30-Jul-2009	0.1 - 0.4m	0.29	0.2	---	6	< 1	6	330	0.6	0.9	19	< 0.15	8	21	10	0.09	1.1	27	1.1	< 1	< 0.3	< 1	2	33	79
MSB-09-2	30-Jul-2009	0.4 - 0.8m	0.31	0.5	---	10	< 1	10	310	0.5	0.5	21	< 0.15	11	22	12	0.08	1.8	31	0.6	< 1	< 0.3	< 1	< 1	34	90
MSB-09-3	30-Jul-2009	0.0 - 0.4m	0.79	2.1	---	160	< 1	10	360	0.5	0.5	20	< 0.15	10	22	11	0.08	2.0	30	0.6	< 1	< 0.3	< 1	1	31	86
	30-Jul-2009	0.7 - 1.2m	0.86	1.4	---	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-4	30-Jul-2009	0.0 - 0.5m	1.8	4.5	---	240	< 1	9	540	< 0.4	0.5	23	< 0.15	8	20	44	0.12	8.1	31	0.8	< 1	0.5	< 1	2	24	160
	30-Jul-2009	0.8 - 1.2m	2.6	5.3	---	780	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-5	30-Jul-2009	0.6 - 1.2m	0.99	3.3	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-6	30-Jul-2009	0.0 - 0.3m	1.5	2.8	---	210	< 1	12 [#1]	310	0.5	0.4	23	< 0.15	12	23	11	0.14	1.8	35	0.6	< 1	< 0.3	< 1	1	35	94
MLS-10-01	30-Jul-2010	0.6 - 1.5m	0.91	2.3	---	150	< 1	14 [#1]	240	< 0.4	0.3	32	< 0.15	11	25	11	0.06	3.3	40	< 0.5	< 1	0.4	< 1	1	34	87
	30-Jul-2010	2.0 - 2.3m	0.82	7.5	---	95	< 1	16 [#1]	310	0.5	0.2	31	< 0.15	15	30	13	< 0.05	2.3	45	0.5	< 1	0.3	< 1	< 1	40	100
MLS-10-02	30-Jul-2010	1.0 - 1.5m	3	4.3	---	780	< 1	10	280	< 0.4	0.3	24	< 0.15	9	20	10	< 0.05	1.7	29	< 0.5	< 1	< 0.3	< 1	< 1	36	75
MLS-10-03	30-Jul-2010	0.3 - 0.5m	0.53	2.0	---	42	< 1	9	310	< 0.4	0.4	22	< 0.15	10	19	11	< 0.05	1.9	30	< 0.5	< 1	< 0.3	< 1	1	33	73
	30-Jul-2010	4.0 - 4.5m	1.1	33 [#2]	---	54	< 1	22 [#2]	300	0.7	0.7	41	< 0.15	20	42	20	1.4	0.4	59	< 0.5	< 1	< 0.3	< 1	< 1	58	790 [#2]
MLS-10-04	31-Jul-2010	0.5 - 1.0m	1.7	2.1	---	120	< 1	13 [#1]	320	0.5	0.4	29	< 0.15	13	26	13	0.08	1.9	38	0.6	< 1	< 0.3	< 1	1	48	100
	31-Jul-2010	3.9 - 4.2m	1	28 [#1]	---	59	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-05	31-Jul-2010	1.0 - 1.5m	4.6 [#1]	3.8	---	1400	< 1	11	380	0.5	0.4	25	< 0.15	12	25	13	0.06	2.7	36	< 0.5	< 1	< 0.3	< 1	< 1	43	90
MLS-10-06	31-Jul-2010	0.5 - 1.0m	0.44	2.7	---	48	< 1	20 [#1]	320	0.6	0.1	41	< 0.15	20	37	15	0.05	1.3	59	< 0.5	< 1	< 0.3	< 1	< 1	56	130
	31-Jul-2010	1.7 - 2.0m	0.46	16 [#1]	---	41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-07	31-Jul-2010	0.9 - 1.5m	0.87	3.7	---	46	< 1	11	280	0.4	0.4	27	< 0.15	12	24	12	0.22	2.8	37	< 0.5	< 1	0.3	< 1	< 1	39	90
	31-Jul-2010	3.8 - 4.3m	1	26 [#1]	---	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-08	31-Jul-2010	0.0 - 0.5m	2	12 [#1]	---	160	< 1	15 [#1]	370	0.5	0.2	32	< 0.15	16	34	14	0.07	2.6	50	0.6	< 1	0.4	< 1	< 1	46	110
	31-Jul-2010	1.5 - 2.0m	2	29 [#1]	---	87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-12-1	16-Jul-2012	0.5 - 1.0m	1.8	8.2	7.36	350	< 1.0	14 [#1]	310	0.66	0.24	34	< 0.15	13	30	11	0.081	1.9	43	0.52	< 1.0	< 0.30	< 1.0	< 1.0	44	120
	16-Jul-2012	2.5 - 3.0m	1.5	10	7.48	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-12-2	16-Jul-2012	0.3 - 0.8m	3.9	6.6	7.15	730	< 1.0	11	450	0.68	0.36	30	< 0.15	12	26	12	< 0.050	2.5	38	0.92	< 1.0	< 0.30	< 1.0	1.4	44	100
	16-Jul-2012	3.2 - 3.7m	1.7	34 [#2]	8.23 [#2]	390	< 1.0	15 [#2]	320	0.95	< 0.10	42	< 0.15	18	42	13	< 0.050	0.46	57	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	58	130
MLS-12-3	16-Jul-2012	1.5 - 2.0m	2.3	6.4	7.11	610	< 1.0	12 [#1]	370	0.72	0.23	31	< 0.15	14	30	11	< 0.050	1.4	42	0.56	< 1.0	< 0.30	< 1.0	< 1.0	45	110
	16-Jul-2012	5.0 - 5.5m	2.2	52 [#2]	8.53 [#2]	520	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-1	19-Aug-2013	1.35 - 1.5m	0.57	0.52	7.14	41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2013	2.0 - 2.15m	0.61	2.3	7.47	41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-Aug-2013	2.85 - 3.0m	0.74	10	7.41	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity				Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Chloride (mg/L)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	---	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
MLS-13-3	23-Aug-2013	0.8 - 1.0m	0.57	2.7	7.14	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	1.3 - 1.5m	0.57	5.3	7.15	8.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.8 - 3.0m	0.92	**25** [#1]	7.77	48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-4	23-Aug-2013	1.2 - 1.5m	0.21	1.7	7.33	5.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.0 - 2.2m	0.26	9.7	6.97	12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.8 - 3.0m	1.1	7.5	7.22	58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-5	23-Aug-2013	1.3 - 1.5m	1.3	3.1	7.42	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.0 - 2.2m	1.1	6.0	7.37	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.8 - 3.0m	0.44	**18** [#1]	7.98	24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	3.5 - 3.7m	0.64	**22** [#2]	7.87	29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	4.1 - 4.3m	0.58	**17** [#2]	**8.22** [#2]	22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-6	25-Aug-2013	0.0 - 0.2m	2.5	5.3	7.60	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	0.5 - 0.7m	0.76	1.4	7.00	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	1.4 - 1.5m	0.95	3.3	7.31	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	1.9 - 2.1m	0.82	3.6	7.34	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.8 - 3.0m	0.73	10	7.39	59	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-7	25-Aug-2013	1.3 - 1.5m	0.41	2.1	7.22	33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.0 - 2.2m	0.55	9.9	7.29	43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.8 - 3.0m	0.93	**15** [#1]	7.48	51	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-8	25-Aug-2013	0.5 - 0.7m	0.25	1.5	**5.49** [#1]	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	1.3 - 1.5m	0.67	0.57	6.94	66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.8 - 3.0m	0.47	1.1	7.19	36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-9	25-Aug-2013	0.2 - 0.4m	0.13	0.78	**5.89** [#1]	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	0.8 - 1.0m	0.19	0.97	6.95	9.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	1.3 - 1.5m	0.27	1.5	7.30	9.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.8 - 3.0m	0.84	**17** [#1]	7.37	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-1-C	15-Feb-2014	Surface	**5.3** [#1]	3.1	6.50	1400	1.2	**14** [#1]	270	1.2	2.7	14	< 0.15	35	65	11	0.093	11	**200** [#1]	**3.1** [#1]	< 1.0	0.76	< 1.0	7.2	34	**520** [#1]
MLS-14-2	27-Feb-2014	1.0m	0.15	1.0	7.36	< 5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Feb-2014	2.0m	0.43	0.51	7.05	< 5.0	< 1.0	**12** [#1]	190	0.69	< 0.10	31	< 0.15	16	32	12	0.055	< 0.40	47	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	40	120
	27-Feb-2014	2.5m	1.7	0.53	7.52	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-2-C	11-Mar-2014	Surface	1.7	2.8	7.13	420	< 1.0	**14** [#1]	270	0.76	0.41	26	< 0.15	15	32	13	< 0.050	1.9	56	0.94	< 1.0	< 0.30	< 1.0	1.1	38	150
MLS-14-3	28-Feb-2014	1.0m	0.21	0.92	7.16	< 5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	2.5m	0.53	9.2	7.25	51	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	3.0m	0.61	9.2	7.33	75	< 1.0	**16** [#1]	350	0.96	< 0.10	37	< 0.15	21	48	17	0.066	0.77	62	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	47	160
MLS-14-3-C	11-Mar-2014	Surface	1.1	8.5	6.77	280	< 1.0	**14** [#1]	300	0.70	0.24	26	< 0.15	14	29	13	< 0.050	1.4	42	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	38	110

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity				Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Chloride (mg/L)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	---	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
MLS-14-4	28-Feb-2014	1.0m	0.24	1.3	6.93	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	2.0m	0.32	4.6	7.41	9.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	3.0m	0.48	11	7.24	21	< 1.0	10	500	0.87	0.12	31	< 0.15	17	38	14	0.057	0.81	51	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	40	130
MLS-14-4-C	11-Mar-2014	Surface	2.9	8.3	7.18	120	< 1.0	15 [#1]	300	0.71	0.17	28	< 0.15	14	29	13	< 0.050	1.2	44	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	36	110
MLS-14-5	02-Mar-2014	1.0m	0.57	1.1	6.44	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	2.0m	0.32	1.8	7.35	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	3.0m	0.55	8.2	7.24	34	< 1.0	13 [#1]	360	0.49	0.17	21	< 0.15	12	28	12	0.056	2.0	36	0.58	< 1.0	< 0.30	< 1.0	< 1.0	29	99
	02-Mar-2014	3.8m	0.96	21 [#2]	8.18 [#2]	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-5-C	12-Mar-2014	0.5m	2.3	3.0	6.93	420	1.5	17 [#1]	350	1.5	4.8	18	< 0.15	46	90	11	0.069	15	260 [#1]	15 [#1]	< 1.0	0.59	< 1.0	10	38	680 [#1]
MLS-14-6-C	12-Mar-2014	0.5m	2.0	2.3	7.02	360	1.3	13 [#1]	290	1.2	3.0	30	< 0.15	38	75	9.7	0.079	12	210 [#1]	9.2 [#1]	< 1.0	0.76	< 1.0	9.5	34	500 [#1]
MLS-14-7-C	12-Mar-2014	0.5m	1.8	4.3	6.79	420	1.3	15 [#1]	300	1.4	3.7	16	< 0.15	42	98 [#1]	9.9	0.069	11	270 [#1]	9.6 [#1]	< 1.0	0.67	< 1.0	14	37	660 [#1]
MLS-14-8	03-Mar-2014	1.0m	0.27	0.97	7.42	7.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	2.0m	0.42	0.81	7.40	< 5.0	< 1.0	18 [#1]	660	0.64	0.22	25	< 0.15	15	32	15	0.069	1.8	46	0.51	< 1.0	< 0.30	< 1.0	< 1.0	34	130
	03-Mar-2014	3.0m	0.28	1.3	7.60	14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-8-C	12-Mar-2014	Surface	0.98	4.4	6.41	180	< 1.0	9.9	300	0.63	0.93	18	< 0.15	12	28	10	0.050	7.2	55	1.8	< 1.0	0.64	< 1.0	1.9	34	160
MLS-14-9	02-Mar-2014	1.0m	0.20	1.4	7.10	7.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	2.0m	0.44	7.3	7.41	24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	3.0m	1.0	19 [#1]	7.53	120	< 1.0	23 [#1]	270	0.75	< 0.10	36	< 0.15	19	35	13	< 0.050	0.45	59	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	44	140
MLS-15-TP1	18-Mar-2015	1.0m	1.5	0.75	6.79	320	< 0.50	9.0	340	1.0	0.63	24	< 0.080	12	24	13	0.067	2.3	37	1.1	< 0.20	0.21	< 1.0	1.8	34	98
	18-Mar-2015	2.0m	0.55	0.44	7.18	52	0.50	13 [#1]	190	0.46	0.32	16	< 0.080	8.7	24	11	0.080	2.3	29	< 0.50	< 0.20	0.32	< 1.0	0.98	27	98
	18-Mar-2015	2.5m	0.56	2.9	7.25	25	0.51	19 [#1]	280	0.48	0.24	27	< 0.080	11	27	11	0.078	2.3	39	0.71	< 0.20	0.32	< 1.0	0.89	30	110
MLS-15-TP2	18-Mar-2015	1.0m	0.72	2.7	5.92 [#1]	42	< 0.50	7.6	350	1.2	0.59	26	< 0.080	13	23	13	0.059	3.2	40	0.99	< 0.20	0.23	< 1.0	2.8	32	100
	18-Mar-2015	2.0m	1.5	6.2	7.22	340	0.65	12 [#1]	230	< 0.40	0.43	23	< 0.080	9.0	23	11	0.073	3.0	32	0.51	< 0.20	0.29	< 1.0	1.0	26	90
S2-15-1	22-Aug-2015	Surface	1.9	18 [#1]	8.51 [#1]	260	2.5	16 [#1]	330	0.46	1.2	27	< 0.080	12	38	170	0.81	4.0	41	0.87	0.23	0.54	< 1.0	0.96	24	420 [#1]
SUMP 5-15-1	17-Sep-2015	Surface	3.8	22 [#1]	7.72	740	< 0.50	9.6	470	1.1	0.40	58	< 0.080	13	27	58	< 0.050	2.1	44	< 0.50	0.27	0.19	1.2	1.8	36	310
MS-08-01	29-Jul-2008	0.0 - 0.3m	1.3	14 [#1]	---	110	< 1	25 [#1]	290	0.5	0.2	38	< 0.15	19	37	14	0.07	0.9	56	< 0.5	< 1	< 0.3	< 1	---	44	160
	29-Jul-2008	1.8 - 2.1m	1	7.8	---	79	< 1	26 [#1]	320	0.6	0.2	43	< 0.15	23	42	17	0.09	0.6	68	< 0.5	< 1	< 0.3	< 1	---	48	180
MS-08-02	29-Jul-2008	0.0 - 0.3m	1	6.1	---	51	< 1	18 [#1]	330	0.5	0.4	27	< 0.15	15	33	14	0.07	1.6	46	0.7	< 1	< 0.3	< 1	---	39	140
	29-Jul-2008	1.8 - 2.1m	1.5	6.9	---	270	< 1	22 [#1]	230	< 0.4	0.3	27	< 0.15	13	27	12	0.08	1.4	40	< 0.5	< 1	< 0.3	< 1	---	35	120
MS-08-03	29-Jul-2008	0.0 - 0.3m	0.78	4.0	---	36	< 1	20 [#1]	350	0.5	0.5	30	< 0.15	16	33	14	0.06	1.4	49	0.6	< 1	< 0.3	< 1	---	41	140
MS08-01	10-Jul-2008		1.4	1.4	---	43	< 1	15 [#1]	180	0.5	0.1	24	< 0.15	12	20	8	< 0.05	0.5	34	< 0.5	< 1	< 0.3	< 1	---	29	95
MS08-02	10-Jul-2008		3.2	1.8	---	23	< 1	17 [#1]	300	0.7	0.3	25	< 0.15	12	23	23	0.08	2.4	40	0.8	< 1	< 0.3	< 1	---	34	130
MS08-03	10-Jul-2008		3.3	3.3	---	35	< 1	8	380	< 0.4	0.5	20	< 0.15	8	25	31	< 0.05	3.9	29	0.6	< 1	< 0.3	< 1	---	25	99

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Salinity: Soluble Chloride (mg/L)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			**4**	**12**	**(6 - 8)**	**---**	**40**	**12**	**2000**	**8**	**22**	**87**	**1.4**	**300**	**91**	**600**	**50**	**40**	**89**	**2.9**	**40**	**1**	**300**	**300**	**130**	**320**
MS08-04	10-Jul-2008		2.3	1.0	---	7	< 1	13 [#1]	230	0.5	0.5	23	< 0.15	11	21	9	< 0.05	1.2	34	< 0.5	< 1	< 0.3	< 1	---	33	90
MS08-05	10-Jul-2008		1.2	1.0	---	11	< 1	22 [#1]	240	1.0	< 0.1	41	< 0.15	22	44	14	0.07	< 0.4	64	< 0.5	< 1	< 0.3	< 1	---	48	170
MS08-06	10-Jul-2008		1.5	11	---	160	< 1	19 [#1]	310	1.1	0.2	40	< 0.15	22	51	18	0.10	1.1	66	0.5	< 1	< 0.3	< 1	---	49	180
MS08-07	10-Jul-2008		0.56	3.0	---	35	< 1	14 [#1]	510	1.0	0.1	40	< 0.15	22	54	19	0.11	1.4	66	0.6	< 1	< 0.3	< 1	---	47	200
MS08-08	10-Jul-2008		1.3	13 [#1]	---	150	< 1	18 [#1]	320	0.8	0.1	34	< 0.15	19	46	16	0.10	1.1	57	< 0.5	< 1	< 0.3	< 1	---	41	170
MS08-09	10-Jul-2008		0.8	4.4	---	88	< 1	13 [#1]	310	0.7	0.1	29	< 0.15	16	36	13	0.11	0.8	47	< 0.5	< 1	< 0.3	< 1	---	35	140
MS08-10	10-Jul-2008		2	3.2	---	76	< 1	12 [#1]	160	< 0.4	0.3	20	< 0.15	9	15	7	< 0.05	1.2	29	< 0.5	< 1	< 0.3	< 1	---	27	72
MS08-11	10-Jul-2008		7.9 [#1]	15 [#1]	---	34	< 1	19 [#1]	230	0.5	0.2	29	< 0.15	12	24	9	0.07	1.1	38	0.7	< 1	< 0.3	< 1	---	30	94
MS08-12	10-Jul-2008		2.1	32 [#1]	---	190	< 1	17 [#1]	150	0.6	< 0.1	29	< 0.15	16	28	10	0.06	< 0.4	47	< 0.5	< 1	< 0.3	< 1	---	33	130
MS08-N-3	19-Jul-2008		1.7	4.4	---	280	< 1	14 [#1]	290	0.5	0.2	25	< 0.15	13	30	11	0.08	1.3	40	< 0.5	< 1	< 0.3	< 1	---	35	120
MS08-NE-2	18-Jul-2008		3.9	16 [#1]	---	73	< 1	22 [#1]	300	0.5	0.2	31	< 0.15	16	35	13	0.07	1.3	49	< 0.5	< 1	< 0.3	< 1	---	42	130
MS08-NE-3	19-Jul-2008		2.4	5.1	---	560	< 1	9	270	< 0.4	0.4	16	< 0.15	7	16	8	< 0.05	1.1	24	< 0.5	< 1	< 0.3	< 1	---	23	65
MS08-NW-3	19-Jul-2008		3.3	10	---	510	< 1	15 [#1]	280	0.5	0.2	27	< 0.15	14	33	12	0.09	1.0	44	< 0.5	< 1	< 0.3	< 1	---	35	130
MS08-NW-4	19-Jul-2008		7 [#1]	17 [#1]	---	430	< 1	18 [#1]	450	0.6	0.2	31	< 0.15	17	37	13	0.10	1.2	51	< 0.5	< 1	< 0.3	< 1	---	38	150
MS08-S-1	18-Jul-2008		3.5	1.5	---	17	< 1	14 [#1]	2300 [#1]	0.4	0.2	27	< 0.15	12	25	20	< 0.05	2.7	39	< 0.5	< 1	< 0.3	< 1	---	36	110
MS08-SE-1	18-Jul-2008		3.2	1.0	---	17	< 1	11	700	< 0.4	0.3	16	< 0.15	7	14	10	< 0.05	1.5	24	< 0.5	< 1	< 0.3	< 1	---	24	64
MS08-SE-2	18-Jul-2008		2.3	2.0	---	14	< 1	18 [#1]	220	0.5	0.2	30	< 0.15	14	27	15	0.05	0.8	44	< 0.5	< 1	< 0.3	< 1	---	40	120
MS08-SUMP-1	28-Jul-2008		5.6 [#1]	61 [#1]	---	1400	< 1	9	1700	0.7	0.6	24	< 0.15	13	50	14	0.05	4.2	53	1.0	< 1	< 0.3	< 1	---	25	95
MS08-SW-1	18-Jul-2008		2.9	0.7	---	8	< 1	18 [#1]	800	0.4	0.4	29	< 0.15	13	27	11	0.06	6.3	46	0.8	< 1	< 0.3	< 1	---	44	120
MS08-SW-4	19-Jul-2008		4.2 [#1]	3.6	---	88	< 1	23 [#1]	1700	0.6	0.3	36	< 0.15	17	41	20	0.09	4.5	56	0.5	< 1	< 0.3	< 1	---	46	170
WSS-05-08	30-Aug-2005	0.0 - 0.3m	7.89 [#1]	8.1	---	2190	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	2.5 - 3.0m	1.68	15.5 [#1]	---	379	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-09	30-Aug-2005	1.0 - 1.5m	2.69	3.9	---	712	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	2.5 - 3.0m	0.762	7.4	---	43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-10	30-Aug-2005	1.0 - 1.5m	3.66	3.4	---	1150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	2.0 - 2.5m	0.587	2.8	---	103	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-11	30-Aug-2005	0.0 - 0.15m	3.05	4.1	---	805	---	2	343	0.3	0.5	12	< 0.3	3.9	15	< 10	< 0.05	1.0	18	< 0.5	---	< 1	---	---	23	42
	30-Aug-2005	2.0 - 2.5m	0.876	11.0	---	24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-12	30-Aug-2005	0.0 - 0.3m	5.83 [#1]	7.4	---	1870	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	0.3 - 1.5m	1.96	4.0	---	529	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	2.5 - 3.0m	0.867	10.0	---	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity				Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Soluble Chloride (mg/L)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Industrial Fine Surface [#1]			4	12	(6 - 8)	---	40	12	2000	8	22	87	1.4	300	91	600	50	40	89	2.9	40	1	300	300	130	320
WS07-B2-3	08-Sep-2007	5.5m	**4.53** [#1]	**14.0** [#1]	---	1430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B3-4	08-Sep-2007	5.5m	3.09	8.6	---	915	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B4 -2	08-Sep-2007	5.5m	**4.9** [#1]	5.4	---	1660	< 1	**23** [#1]	331	1.0	0.1	44	< 0.2	23	44	16	< 0.05	< 0.4	64	< 0.5	< 1	< 0.3	< 1	---	56	175
WS07-B4-4	08-Sep-2007	5.5m	1.8	8.9	---	501	< 1	**20** [#1]	282	0.9	0.1	41	< 0.2	21	50	16	< 0.05	< 0.4	60	< 0.5	< 1	< 0.3	< 1	---	52	158
WS07-N2	08-Sep-2007	1.5 - 3.0m	1.55	3.3	---	426	< 1	**27** [#1]	365	0.7	0.1	40	< 0.2	20	41	17	0.05	0.5	57	< 0.5	< 1	< 0.3	< 1	---	55	169
WS07-N4	08-Sep-2007	0.0 - 1.5m	2.69	2.0	---	709	< 1	10	592	< 0.4	0.5	22	< 0.2	10	23	11	< 0.05	2.9	33	0.8	< 1	< 0.3	< 1	---	32	93
	26-Sep-2007	3.0 - 4.0m	0.97	8.7	7.7	209	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-W2	10-Sep-2007	1.5 - 3.0m	**14.2** [#1]	1.8	---	5230	< 1	**17** [#1]	621	0.8	0.1	33	< 0.2	18	39	17	0.05	< 0.4	54	< 0.5	< 1	< 0.3	< 1	---	41	155
WS07-W3	10-Sep-2007	3.0 - 4.0m	**4.58** [#1]	4.5	---	1540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E1	27-Sep-2007	3.0 - 4.0m	3.1	6.5	7.41	1,070	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E2	27-Sep-2007	0.0 - 1.5m	2.9	1.1	7.31	240	---	10	1,170	<0.4	0.7	18	<0.2	9	26	14	<0.05	7.6	35	1.2	---	0.6	---	---	32	98
WS07-E3	27-Sep-2007	1.5 - 3.0m	1.53	4.6	7.6	432	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E4	27-Sep-2007	3.0 - 4.0m	1.15	4.2	7.54	284	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S2	26-Sep-2007	0.0 - 1.5m	**5.47** [#1]	2.6	7.02	1,920	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S3	27-Sep-2007	1.5 - 3.0m	3.89	5.1	7.15	1,420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S4	26-Sep-2007	0.0 - 1.5m	1.34	4.9	7.38	252	---	8	531	0.5	0.6	18	<0.2	10	26	11	<0.05	1.9	29	<0.5	---	<0.3	---	---	26	100
WS07-S5	27-Sep-2007	3.0 - 4.0m	3.8	5.5	7.36	1,210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-B2-2	16-Sep-2008	3.0 - 4.0m	**4.2** [#1]	**20** [#1]	---	1200	< 1	**39** [#1]	600	0.9	0.2	45	< 0.15	23	50	14	0.05	1.2	66	< 0.5	< 1	< 0.3	< 1	---	53	160
WS08-EAST CLAY	11-Aug-2008		1.9	3.7	---	530	< 1	**15** [#1]	380	0.5	0.2	22	< 0.15	10	23	9	0.06	0.7	33	< 0.5	< 1	< 0.3	< 1	---	29	86
WS08-N1	14-Sep-2008	3.0 - 4.0m	2.5	2.6	---	470	< 1	**20** [#1]	240	0.8	< 0.1	39	< 0.15	18	39	12	0.05	2.1	58	< 0.5	< 1	< 0.3	< 1	---	47	150
WS08-S2	14-Sep-2008	3.0 - 4.0m	3.7	4.6	---	1100	< 1	**12** [#1]	250	0.5	0.3	34	< 0.15	11	25	10	0.06	1.9	41	< 0.5	< 1	< 0.3	< 1	---	33	100
WS08-W3	14-Sep-2008	3.0 - 4.0m	3.4	4.2	---	970	< 1	**22** [#1]	230	0.7	< 0.1	39	< 0.15	19	39	12	< 0.05	0.4	58	< 0.5	< 1	< 0.3	< 1	---	48	150

NOTES:
1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Industrial, Fine-grained Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																				
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**1**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Fine Subsoil [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-1	28-Jul-2009	2.7 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	45	210	40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Jul-2009	2.7 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	66	290	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-3	28-Jul-2009	1.9 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	100	25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-4	27-Jul-2009	2.7 - 3.0m	0.19	< 0.020	0.71	2.0	220	**850** [#3]	1600	430	---	2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2009	3.3 - 3.6m	< 0.0050	< 0.020	0.062	0.20	37	330	760	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2009	4.9 - 5.2m	< 0.0050	< 0.020	< 0.010	< 0.040	120	570	780	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-5	27-Jul-2009	1.8 - 2.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	100	310	47	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2009	2.4 - 2.7m	2.3	2.7	5.2	19	**1100** [#3]	**1900** [#3]	**9300** [#3]	3200	---	**13000** [#3]	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0088	---	0.016	0.016	< 0.0050	< 0.0050	< 0.0050	**0.34** [#1]	< 0.0050	0.071	0.037	0.28	**1.2** [#1]	**0.95** [#1]	0.063
	27-Jul-2009	3.3 - 3.6m	< 0.0050	0.10	0.14	0.38	130	510	950	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2009	4.1 - 4.4m	< 0.0050	0.054	< 0.010	0.17	56	380	820	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-7	28-Jul-2009	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	140	530	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2009	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	53	270	97	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	---	0.0069	0.0069	< 0.0050	< 0.0050	< 0.0050	0.016	< 0.0050	0.034	0.018	0.10	< 0.0050	**0.10** [#1]	0.0092
	28-Jul-2009	4.0 - 4.3m	5.3	13	3.9	20	310	**1300** [#4]	**15000** [#4]	5400	---	**23000** [#4]	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	---	0.025	0.025	< 0.0050	< 0.0050	0.20	**0.86** [#2]	< 0.0050	0.21	0.11	0.92	**1.2** [#2]	**3.7** [#2]	0.28
	28-Jul-2009	4.8 - 5.1m	0.042	< 0.020	0.11	0.54	220	790	1400	370	---	1600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-8	28-Jul-2009	0.8 - 1.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	110	590	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2009	2.7 - 3.0m	0.18	< 0.020	1.5	1.4	**650** [#3]	**3100** [#3]	**7300** [#3]	2200	---	**9600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-9	28-Jul-2009	1.1 - 1.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	39	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-12	31-Jul-2009	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-13	31-Jul-2009	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	110	300	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-15	31-Jul-2009	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	26	**350** [#3]	**2600** [#3]	940	---	3900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-16	31-Jul-2009	2.7 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	25	**370** [#3]	810	190	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2009	3.0 - 3.3m	2.8	14	5.3	26	**870** [#4]	**5500** [#4]	**12000** [#4]	3600	---	**16000** [#4]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2009	4.8 - 5.7m	0.24	0.43	0.28	1.5	63	790	1300	330	---	1600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2009	6.75 - 7.5m	< 0.0050	< 0.020	< 0.010	0.049	37	**1100** [#4]	1700	400	---	1900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-17	29-Jul-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**330** [#3]	700	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2009	1.0 - 1.3m	< 0.0050	0.082	0.055	0.28	49	**380** [#3]	940	250	---	1100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2009	3.3 - 3.6m	< 0.0050	0.026	0.016	0.060	220	**1200** [#4]	1800	430	---	2100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-19	29-Jul-2009	2.7 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	40	**390** [#3]	450	37	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2009	5.9 - 6.0m	< 0.0050	0.025	0.014	0.083	350	650	1000	240	---	1100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2009	6.0 - 6.3m	0.030	0.11	0.098	0.49	39	160	240	25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																				
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			110	330	430	230	---	---	---	---	---	---	0.28	320	32	10	72	5.3	5.3	5.3	10	10	180	0.25	10	1	1	1	0.013	0.046	100
CCME Industrial Fine Subsoil [#2]			620	660	860	460	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	320	260	2500	6600	6600	6600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	800	1000	5000	10000	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-20	01-Aug-2009	0.7 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	43	240	26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Aug-2009	0.7 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	66	290	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2009	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	140	**1200** [#3]	1800	480	---	1600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Aug-2009	4.9 - 5.2m	< 0.0050	< 0.020	< 0.010	< 0.040	260	**1200** [#4]	2000	520	---	2400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-21	31-Jul-2009	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	32	**740** [#3]	1400	350	---	1700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2009	3.3 - 3.6m	< 0.0050	< 0.020	0.019	0.091	110	**1400** [#4]	2800	1000	---	3700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-22	01-Aug-2009	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-23	29-Jul-2009	0.7 - 1.0m	< 0.0050	< 0.020	< 0.010	0.044	< 12	43	220	40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-24	28-Jul-2009	0.7 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	24	120	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Jul-2009	3.3 - 3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	91	640	910	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-09-25	29-Jul-2009	0.8 - 1.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	16	73	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2009	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	14	**360** [#3]	590	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-1	30-Jul-2009	0.1 - 0.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	68	18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2009	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-2	30-Jul-2009	0.4 - 0.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	12	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-3	30-Jul-2009	1.2 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	11	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-4	30-Jul-2009	0.0 - 0.5m	< 0.0050	< 0.020	0.046	0.098	14	**2500** [#3]	**6500** [#3]	1200	---	**6700** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2009	0.5 - 0.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	88	87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2009	1.2 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	31	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-5	30-Jul-2009	0.3 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	15	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2009	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	0.079	140	**1700** [#4]	3300	1000	---	3200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MSB-09-6	30-Jul-2009	0.7 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	11	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2009	2.4 - 3.0m	< 0.0050	0.026	0.020	0.16	270	**2100** [#3]	**3300** [#3]	1100	---	3700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-01	30-Jul-2010	0.6 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	74	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2010	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	32	200	280	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-02	30-Jul-2010	1.7 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	160	950	260	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-03	30-Jul-2010	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	16	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2010	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	69	850	1400	2500 330	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																				
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**1**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Fine Subsoil [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-04	31-Jul-2010	1.5 - 1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	21	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2010	4.2 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	17	130	200	23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-05	31-Jul-2010	1.5 - 1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	16	86	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-06	31-Jul-2010	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	25	220	46	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2010	1.7 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**320** [#3]	880	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-07	31-Jul-2010	0.9 - 1.5m	< 0.0050	0.058	< 0.010	< 0.040	< 12	11	82	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2010	3.8 - 4.3m	< 0.0050	< 0.020	< 0.010	0.052	88	710	1100	210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-08	31-Jul-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	58	250	44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Jul-2010	1.5 - 2.0m	0.046	< 0.020	0.11	< 0.040	15	**370** [#3]	540	67	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-12-1	16-Jul-2012	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	52	150	29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2012	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	47	260	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-12-2	16-Jul-2012	0.3 - 0.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	100	350	71	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2012	2.5 - 2.8m	1.7	0.21	1.6	1.5	230	**930** [#3]	**5400** [#3]	1800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2012	3.2 - 3.7m	< 0.0050	< 0.020	0.012	0.052	55	500	770	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-12-3	16-Jul-2012	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	95	220	43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2012	4.2 - 4.5m	7.0	53	25	110	**2800** [#4]	**2000** [#4]	3400	1000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Jul-2012	5.0 - 5.5m	0.082	0.11	0.048	0.21	55	290	380	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-2	23-Aug-2013	1.5 - 1.7m	< 0.0050	< 0.020	< 0.010	0.083	< 12	90	540	---	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.0 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	180	940	---	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-3	23-Aug-2013	0.8 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	23	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.8 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	38	100	73	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-4	23-Aug-2013	1.2 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	89	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.0 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	98	160	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.8 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	140	310	---	70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-5	23-Aug-2013	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	18	160	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.0 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	160	740	---	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	2.8 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	40	**940** [#3]	1400	---	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	3.5 - 3.7m	< 0.0050	< 0.020	0.013	0.066	110	850	1200	---	230	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	4.1 - 4.3m	< 0.0050	< 0.020	< 0.010	< 0.040	37	270	410	---	68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-7	25-Aug-2013	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	28	88	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.0 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	79	240	---	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.8 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	190	410	---	98	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**1**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Fine Subsoil [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-13-8	25-Aug-2013	0.5 - 0.7m	< 0.017	< 0.070	< 0.030	< 0.13	< 40	< 33	470	---	< 170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	1.3 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	19	16	160	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2013	2.8 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	17	< 10	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-1-C	15-Feb-2014	Surface	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	19	120	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	0.0066	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.031	0.016	0.090	< 0.0050	0.018	< 0.0050
MLS-14-2	27-Feb-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	74	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Feb-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	170	1800	---	830	2700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Feb-2014	2.5m	< 0.0050	< 0.020	0.015	< 0.040	140	**920** [#3]	1400	---	320	---	0.037	< 0.025	< 0.0040	< 0.025	< 0.0050	< 0.10	0.011	0.011	< 0.0050	< 0.0050	0.014	**0.26** [#1]	< 0.0050	0.072	0.038	0.28	**0.050** [#1]	**0.83** [#1]	0.086
MLS-14-2-C	11-Mar-2014	Surface	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	84	470	---	180	---	< 0.0050	0.0058	< 0.0040	0.0051	< 0.0050	< 0.10	0.0076	0.0076	< 0.0050	< 0.0050	< 0.0050	0.031	< 0.0050	0.042	0.022	0.14	**0.055** [#1]	**0.22** [#1]	0.017
MLS-14-3	28-Feb-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0065	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.030	0.016	0.084	< 0.0050	0.018	< 0.0050
	28-Feb-2014	2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	90	170	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	180	370	---	84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-3-C	11-Mar-2014	Surface	0.035	< 0.020	< 0.010	< 0.040	< 12	56	220	---	61	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	0.0071	< 0.0050	< 0.0050	< 0.0050	0.0052	< 0.0050	0.038	0.020	0.12	**0.013** [#1]	**0.073** [#1]	0.0072
(Duplicate)	11-Mar-2014	Surface	0.051	< 0.020	0.074	0.37	< 12	88	280	---	72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-4	28-Feb-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	0.0067	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.033	0.017	0.098	< 0.0050	0.018	< 0.0050
(Duplicate)	28-Feb-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	72	130	---	< 50	---	< 0.0050	< 0.0052	< 0.0040	0.010	0.0067	< 0.10	0.019	0.019	< 0.0050	0.0070	0.012	0.024	< 0.0050	0.074	0.039	0.29	0.011	**0.13** [#1]	0.024
MLS-14-4-C	11-Mar-2014	Surface	0.021	0.056	0.051	0.31	< 12	230	410	---	110	---	0.0079	< 0.012	< 0.0040	0.0066	< 0.0050	< 0.10	0.012	0.012	< 0.0050	0.0059	< 0.0050	0.050	< 0.0050	0.057	0.030	0.21	**0.075** [#1]	**0.27** [#1]	0.025
MLS-14-5	02-Mar-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	59	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	21	70	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	0.0066	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.032	0.016	0.091	< 0.0050	0.016	< 0.0050
(Duplicate)	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	94	---	61	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	68	280	---	62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	3.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	110	150	---	< 50	---	< 0.022	0.017	< 0.0040	0.032	0.016	< 0.10	0.035	0.035	< 0.0050	0.0095	0.013	0.16	0.0090	0.12	0.063	0.51	**0.029** [#2]	**0.55** [#2]	0.057
MLS-14-5-C	12-Mar-2014	0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	100	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.026	0.013	0.062	< 0.0050	0.0084	< 0.0050
MLS-14-6-C	12-Mar-2014	0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	29	120	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.030	0.016	0.082	< 0.0050	0.018	< 0.0050
MLS-14-7-C	12-Mar-2014	0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	29	120	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.025	0.013	0.061	< 0.0050	0.015	< 0.0050
MLS-14-8	03-Mar-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	33	160	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	0.063	29	**710** [#3]	1100	---	210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-8-C	12-Mar-2014	Surface	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	49	300	---	86	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	0.0066	< 0.0050	< 0.0050	< 0.0050	0.012	< 0.0050	0.031	0.016	0.088	**0.014** [#1]	**0.089** [#1]	0.0057

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																				
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**1**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Fine Subsoil [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-14-9	02-Mar-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	66	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**410** [#3]	730	---	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Mar-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**370** [#3]	770	---	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-15-TP1	18-Mar-2015	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	110	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	0.0066	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.032	0.017	0.093	< 0.0050	0.018	0.0070
	18-Mar-2015	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	73	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	0.0066	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.032	0.017	0.093	< 0.0050	0.026	0.0055
	18-Mar-2015	2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	36	150	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0076	0.0076	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.044	0.023	0.15	0.0087	**0.057** [#1]	0.0083
MLS-15-TP2	18-Mar-2015	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	100	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0068	0.0068	< 0.0050	< 0.0050	0.0050	< 0.0050	< 0.0050	0.034	0.018	0.10	< 0.0050	0.018	0.0072
	18-Mar-2015	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	77	---	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	0.0067	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.033	0.017	0.095	< 0.0050	0.019	< 0.0050
(Duplicate)	18-Mar-2015	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	55	---	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S2-15-1	22-Aug-2015	Surface	1.1	4.7	3.5	23	**330** [#3]	**5100** [#3]	**11000** [#3]	---	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
SUMP 5-15-1	17-Sep-2015	Surface	0.64	1.5	4.2	33	**980** [#3]	**11000** [#3]	**6500** [#3]	---	960	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS-08-01	29-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	43	62	10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2008	1.8 - 2.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	18	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS-08-02	29-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	59	200	47	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2008	1.8 - 2.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS-08-03	29-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	66	210	67	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-01	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	33	140	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-02	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	20	**270** [#3]	710	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-03	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	190	800	230	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-04	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	67	350	66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-05	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	69	100	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-06	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	55	79	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-07	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	47	41	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-08	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	34	42	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-09	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	35	55	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-10	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	68	280	68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-11	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	42	60	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-12	10-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	130	220	22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-NE-3	19-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	22	50	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																				
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**1**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Fine Subsoil [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-SE-2	18-Jul-2008		< 0.0050	< 0.020	< 0.010	< 0.040	< 12	79	190	60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MS08-SUMP-1	28-Jul-2008		< 0.0050	< 0.020	0.48	1.8	44	**420** [#3]	1300	610	---	< 500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-08	30-Aug-2005	2.5 - 3.0m	< 0.04	< 0.1	< 0.1	< 0.3	40	**708** [#3]	1320	287	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-09	30-Aug-2005	2.5 - 3.0m	< 0.04	< 0.1	< 0.1	< 0.3	28	48	68	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-10	30-Aug-2005	2.0 - 2.5m	< 0.04	< 0.1	< 0.1	< 0.3	17	19	47	12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-11	30-Aug-2005	0.0 - 0.15m	< 0.04	< 0.1	< 0.1	< 0.3	49	18	297	49	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	2.0 - 2.5m	< 0.04	< 0.1	< 0.1	< 0.3	24	100	217	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WSS-05-12	30-Aug-2005	2.5 - 3.0m	< 0.04	< 0.1	< 0.1	< 0.3	33	46	54	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B2-3	08-Sep-2007	5.5m	< 0.0050	0.064	0.075	< 0.040	20	254	628	185	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B2-5	08-Sep-2007	5.5m	< 0.0050	0.14	0.093	0.22	< 10	202	525	146	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B3-2	08-Sep-2007	5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	157	429	112	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B3-4	08-Sep-2007	5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	96	285	85	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B4 -2	08-Sep-2007	5.5m	0.28	0.17	0.15	0.19	< 10	174	510	141	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-B4-4	08-Sep-2007	5.5m	0.34	0.41	0.29	0.13	98	977	1690	494	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-N2	08-Sep-2007	1.5 - 3.0m	0.16	0.10	0.22	0.081	29	249	836	244	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-N3	26-Sep-2007	0.0 - 1.5m	<0.0050	<0.020	<0.010	<0.040	<12	23	403	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Sep-2007	3.0 - 4.0m	0.51	0.68	0.36	0.22	150	**1260** [#4]	1820	365	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-N4	08-Sep-2007	0.0 - 1.5m	< 0.0050	< 0.020	0.042	0.050	< 10	145	722	263	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Sep-2007	3.0 - 4.0m	0.068	<0.020	0.013	0.19	100	775	1,220	261	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-W2	10-Sep-2007	1.5 - 3.0m	1.5	0.044	0.26	0.089	< 10	120	283	49	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-W3	10-Sep-2007	3.0 - 4.0m	1.6	0.80	0.081	0.69	143	**1030** [#4]	1620	369	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E1	27-Sep-2007	3.0 - 4.0m	0.13	<0.020	<0.010	<0.040	<12	232	384	108	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E2	27-Sep-2007	0.0 - 1.5m	<0.0050	0.023	0.027	0.15	18	179	848	321	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E3	27-Sep-2007	1.5 - 3.0m	<0.0050	<0.020	<0.010	<0.040	<12	57	239	113	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-E4	27-Sep-2007	3.0 - 4.0m	<0.0050	<0.020	<0.010	<0.040	<12	197	703	291	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S2	24-Aug-2004	0.0 - 1.5m	0.018	0.032	0.022	0.08	<12	460	1,960	652	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S3	26-Sep-2007	1.5 - 3.0m	<0.0050	<0.020	<0.010	<0.040	<12	53	201	114	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S4	27-Sep-2007	0.0 - 1.5m	0.017	0.066	0.02	0.1	<12	523	**2710** [#3]	1,280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC										PAH																				
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C^6-C^{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (ESRD) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate ESRD IACR (Fine Grained Soils) (none)	Calculate ESRD IACR (Coarse Grained Soils) (none)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Industrial Fine Surface [#1]			**110**	**330**	**430**	**230**	---	---	---	---	---	---	**0.28**	**320**	**32**	**10**	**72**	**5.3**	**5.3**	**5.3**	**10**	**10**	**180**	**0.25**	**10**	**1**	**1**	**1**	**0.013**	**0.046**	**100**
CCME Industrial Fine Subsoil [#2]			**620**	**660**	**860**	**460**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Surface [#3]			---	---	---	---	**320**	**260**	**2500**	**6600**	**6600**	**6600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME PHC in Soil Industrial Fine Subsoil [#4]			---	---	---	---	**800**	**1000**	**5000**	**10000**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS07-S5	26-Sep-2007	3.0 - 4.0m	0.083	<0.020	<0.010	0.061	78	924	1,550	367	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-B2-2	16-Sep-2008	3.0 - 4.0m	0.034	0.11	0.048	0.28	52	340	660	220	---	840	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-EAST CLAY	11-Aug-2008		0.17	< 0.020	< 0.010	< 0.040	< 12	82	250	62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-N1	14-Sep-2008	3.0 - 4.0m	0.88	< 0.020	0.11	0.23	46	600	1000	240	---	720	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-N5	16-Sep-2008	6.0 - 7.0m	1.7	0.50	0.096	0.34	68	830	1500	500	---	2100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-S2	14-Sep-2008	3.0 - 4.0m	0.15	< 0.020	< 0.010	< 0.040	< 12	12	33	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-S4	16-Sep-2008	2.0 - 3.0m	0.032	< 0.020	< 0.010	< 0.040	< 12	150	260	52	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-S6	16-Sep-2008	1.0 - 2.0m	< 0.0050	0.028	< 0.010	< 0.040	< 12	20	51	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-W1	16-Sep-2008	4.0 - 5.0m	0.99	0.077	0.067	0.12	69	620	1000	320	---	1200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WS08-W3	14-Sep-2008	3.0 - 4.0m	0.46	< 0.020	< 0.010	< 0.040	13	380	760	290	---	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Subsoils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Subsoils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date	Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
MLS 02-10-8	23-Aug-2013	630 [#1]	---	0.015	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2013	630 [#1]	---	0.061	< 0.015	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	840 [#1]	---	< 0.010	< 0.010	---	0.0047	0.0024	1.6 [#1]	< 0.000025	< 0.0010	0.0020	0.47 [#1]	< 0.00020	---	0.00072	0.0014	< 0.00020	0.00039 [#1]	< 0.00020	0.00013	0.0077
(Duplicate)	29-Jul-2014	790 [#1]	---	< 0.010	< 0.010	---	0.0043	0.0024	1.6 [#1]	< 0.000025	< 0.0010	0.0039	0.47 [#1]	< 0.00020	---	0.00068	0.0011	< 0.00020	< 0.00010	< 0.00020	0.00012	0.0064
	07-Aug-2015	590 [#1]	---	0.015	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	07-Aug-2015	590 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	540 [#1]	---	< 0.010	< 0.010	---	0.0040	0.0035	1.9 [#1]	< 0.000020	< 0.0010	0.0012	0.79 [#1]	< 0.00020	---	0.00050	0.0040	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0080
	16-Aug-2017	670 [#1]	---	< 0.10	< 0.10 [#1]	---	< 0.0030	0.0037	1.8 [#1]	< 0.000020	< 0.0010	0.00088	2.3 [#1]	< 0.00020	---	0.00058	0.00096	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0078
MLS 02-5-8	23-Aug-2013	870 [#1]	---	0.017	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	920 [#1]	---	2.1	< 0.010	---	< 0.030	0.0022	1.2	< 0.00020 [#1]	< 0.010 [#1]	0.0022	0.44 [#1]	< 0.0020	---	0.0029	< 0.0050	0.0038 [#1]	< 0.0010 [#1]	< 0.0020 [#1]	0.0026	< 0.030
	08-Aug-2015	830 [#1]	---	0.013	< 0.010	---	< 0.0030	0.0016	1.4	< 0.000020	< 0.0010	0.0011	0.95 [#1]	0.00029	---	0.00057	0.0022	0.00073	< 0.00010	< 0.00020	0.0025	0.0083
	03-Aug-2016	1100 [#1]	---	0.062	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	990 [#1]	---	< 0.10	< 0.10 [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 02-6-9	25-Aug-2003	1080 [#1]	7.3	< 0.2	< 0.06	---	---	< 0.005	1.375	< 0.002 [#1]	< 0.007	< 0.009 [#1]	0.030	< 0.10 [#1]	< 0.00005 [#1]	---	---	< 0.001	---	---	< 1.0 [#1]	< 0.005
	24-Aug-2004	1220 [#1]	7.9	< 0.2	< 0.06	---	< 0.050	< 0.050 [#1]	1.493	< 0.000170 [#1]	< 0.005	0.054 [#1]	0.438 [#1]	< 0.010 [#1]	< 0.00005 [#1]	< 0.005	< 0.008	< 0.010 [#1]	< 0.0010 [#1]	< 0.0080 [#1]	< 0.010	< 0.005
	27-Aug-2005	1130 [#1]	8.0	< 0.2	< 0.06	20 [#1]	< 0.005	< 0.005	1.23	0.00002	< 0.007	< 0.002	0.468 [#1]	< 0.001	< 0.00005 [#1]	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	22-Aug-2006	1120 [#1]	8.1	< 0.2	< 0.06	17 [#1]	< 0.005	< 0.005	1.33	< 0.00001	< 0.007	0.004 [#1]	0.482 [#1]	< 0.001	< 0.00005 [#1]	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	22-Aug-2007	1330 [#1]	7.8	< 0.2	< 0.06	33 [#1]	< 0.001	0.006 [#1]	1.20	< 0.00001	0.006	0.0037	< 0.06	0.0008	---	0.0032	0.0022	0.006 [#1]	0.0006 [#1]	< 0.0002	0.0005	0.024
MLS 02-7-7	22-Aug-2006	2600 [#1]	7.6	< 0.2	< 0.06	36 [#1]	< 0.005	< 0.005	1.11	< 0.00001	< 0.007	0.006 [#1]	5.27 [#1]	< 0.001	< 0.00005 [#1]	< 0.006	< 0.008	< 0.001	< 0.0001	< 0.0008	< 0.001	< 0.005
	22-Aug-2007	5400 [#1]	7.1	2.0	< 0.06	39 [#1]	0.004	0.002	1.01	< 0.00001	0.003	0.0121 [#1]	27.1 [#1]	0.0036	---	0.0008	< 0.0005	< 0.001	0.0002	< 0.0002	< 0.0001	0.041 [#1]
	19-Aug-2008	2500 [#1]	7.2	0.02	< 0.02	69 [#1]	< 0.001	0.004	---	0.00003	< 0.001	0.0075 [#1]	2.7 [#1]	< 0.0002	---	< 0.0002	0.0037	< 0.001	< 0.0001	< 0.0002	< 0.0001	0.048 [#1]
	19-Aug-2010	950 [#1]	8.09	0.014	< 0.003	5 [#1]	0.001	0.0009	1.2	< 0.000005	< 0.001	0.0016	0.06	0.0002	---	0.0005	0.0017	< 0.0002	< 0.0001	< 0.0002	0.0040	0.018
	19-Aug-2011	1300 [#1]	---	0.006	< 0.003	10 [#1]	< 0.01	< 0.002	1.1	< 0.00005	< 0.01 [#1]	< 0.002	< 0.06	< 0.002	---	< 0.002	< 0.005	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.004	< 0.03
	29-Jul-2014	190 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Aug-2015	210 [#1]	---	0.015	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	410 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	200 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 02-8-8	17-Aug-2012	1900 [#1]	---	< 0.030	0.041	9.6 [#1]	0.0039	0.0022	1.4	0.000037	< 0.0010	0.0021	1.5 [#1]	0.00027	---	0.00045	0.0029	0.00060	< 0.00010	< 0.00020	0.00010	0.019
(Duplicate)	17-Aug-2012	---	---	---	---	8.4 [#1]	0.0027	0.0022	1.4	0.000027	< 0.0010	0.0018	1.6 [#1]	< 0.00020	---	0.00039	0.0025	0.00058	< 0.00010	< 0.00020	< 0.00010	0.017
	23-Aug-2013	2500 [#1]	---	0.092	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2013	2500 [#1]	---	0.018	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	2000 [#1]	---	< 0.010	< 0.010	---	0.0047	0.0018	1.4	< 0.000025	< 0.0010	0.0021	3.8 [#1]	< 0.00020	---	< 0.00020	0.0012	0.0025 [#1]	< 0.00010	< 0.00020	< 0.00010	0.0075
(Duplicate)	29-Jul-2014	1800 [#1]	---	< 0.010	< 0.010	---	0.0046	0.0019	1.4	< 0.000025	< 0.0010	0.0020	3.7 [#1]	< 0.00020	---	< 0.00020	0.0013	0.0020 [#1]	< 0.00010	< 0.00020	< 0.00010	0.0066
	07-Aug-2015	2300 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	2200 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Aug-2016	2300 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	2400 [#1]	---	< 0.10	< 0.10 [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2017	2200 [#1]	---	0.12	< 0.10 [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
MLS 02-9-8	19-Aug-2010	**2000 [#1]**	8.27	0.015	0.003	**4 [#1]**	< 0.001	0.0019	1.4	0.000011	< 0.001	0.0026	< 0.06	0.0002	---	0.0007	0.0018	< 0.0002	< 0.0001	< 0.0002	0.0003	0.023
(Duplicate)	19-Aug-2010	---	---	---	---	**5 [#1]**	< 0.001	0.0021	1.4	0.000013	< 0.001	0.0035	< 0.06	< 0.0002	---	0.0005	0.0019	0.0003	< 0.0001	< 0.0002	0.0003	0.020
	19-Aug-2011	**2000 [#1]**	---	0.010	< 0.003	**7 [#1]**	< 0.01	0.003	1.4	< 0.00005	**< 0.01 [#1]**	0.003	**0.79 [#1]**	< 0.002	---	< 0.002	< 0.005	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	< 0.001	< 0.03
	17-Aug-2012	**2000 [#1]**	---	< 0.030	0.038	**5.1 [#1]**	0.0082	0.0029	1.3	0.000027	< 0.0010	0.0025	**1.1 [#1]**	0.00028	---	0.00091	0.0028	0.00037	< 0.00010	< 0.00020	0.00040	0.011
	23-Aug-2013	**1600 [#1]**	---	0.024	< 0.015	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**1700 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Aug-2015	**1500 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**1600 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	**1500 [#1]**	---	< 0.10	**< 0.10 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 08-1-4	23-Aug-2013	**480 [#1]**	---	0.0076	0.0042	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**450 [#1]**	---	0.060	0.017	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-2015	**310 [#1]**	---	0.082	0.014	---	< 0.030	< 0.0020	**1.9 [#1]**	**< 0.00020 [#1]**	**< 0.010 [#1]**	< 0.0020	0.092	< 0.0020	---	< 0.0020	0.021	**< 0.0020 [#1]**	**< 0.0010 [#1]**	**< 0.0020 [#1]**	0.0021	< 0.030
	04-Aug-2016	**280 [#1]**	---	< 0.010	< 0.010	---	0.025	0.0010	**1.8 [#1]**	0.000034	< 0.0010	0.00020	**0.40 [#1]**	< 0.00020	---	0.00065	0.0093	< 0.00020	< 0.00010	< 0.00020	0.0011	0.014
	16-Aug-2017	**500 [#1]**	---	0.032	0.010	---	< 0.0030	0.0020	**1.9 [#1]**	< 0.000020	< 0.0010	< 0.00020	**0.77 [#1]**	< 0.00020	---	0.00042	0.0027	0.00037	< 0.00010	< 0.00020	0.00044	0.0074
MLS 08-2-5	19-Aug-2008	**2300 [#1]**	7.7	0.009	0.018	**29 [#1]**	0.011	< 0.001	---	0.00001	< 0.001	**0.0058 [#1]**	**0.80 [#1]**	< 0.0002	---	< 0.0002	0.0046	< 0.001	< 0.0001	< 0.0002	0.0004	**0.13 [#1]**
	19-Aug-2009	**3200 [#1]**	7.65	0.009	< 0.003	3	< 0.001	0.0018	0.85	< 0.000005	< 0.001	0.0005	**1.7 [#1]**	0.0002	---	0.0004	0.0036	**0.0031 [#1]**	< 0.0001	< 0.0002	< 0.0001	0.004
	19-Aug-2010	**2600 [#1]**	7.93	0.008	0.004	3	< 0.001	0.0013	0.93	< 0.000005	< 0.001	0.0012	**2.1 [#1]**	< 0.0002	---	0.0005	0.0016	**0.0013 [#1]**	< 0.0001	< 0.0002	< 0.0001	0.006
	19-Aug-2011	**2200 [#1]**	---	< 0.003	< 0.003	< 2	< 0.01	< 0.002	0.91	< 0.00005	**< 0.01 [#1]**	**0.011 [#1]**	**1.7 [#1]**	< 0.002	---	< 0.002	< 0.005	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	< 0.001	< 0.03
	18-Aug-2012	**2100 [#1]**	---	< 0.030	0.039	< 2.0	0.0046	0.00090	0.98	0.000016	< 0.0010	0.00084	**1.7 [#1]**	< 0.00020	---	< 0.00020	0.0012	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0067
	23-Aug-2013	**2200 [#1]**	---	0.0072	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**680 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-2015	**280 [#1]**	---	0.016	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**240 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	**710 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2017	**310 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 08-3-4	18-Aug-2012	**380 [#1]**	---	< 0.0030	< 0.0030	2.5	0.0048	0.0025	1.2	**0.000095 [#1]**	< 0.0010	0.0017	< 0.060	< 0.00020	---	0.0033	0.0031	0.00037	< 0.00010	< 0.00020	0.0047	0.0068
	23-Aug-2013	**400 [#1]**	---	0.016	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**370 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Aug-2015	**510 [#1]**	---	0.014	< 0.010	---	< 0.030	< 0.0020	**1.6 [#1]**	**< 0.00020 [#1]**	**< 0.010 [#1]**	0.0023	0.069	< 0.0020	---	0.0025	0.012	**< 0.0020 [#1]**	**< 0.0010 [#1]**	**< 0.0020 [#1]**	0.0080	**0.033 [#1]**
	04-Aug-2016	**450 [#1]**	---	0.011	< 0.010	---	0.0045	0.00092	1.3	**0.00015 [#1]**	< 0.0010	0.00084	< 0.060	< 0.00020	---	0.0018	0.0075	< 0.00020	< 0.00010	< 0.00020	0.0074	0.0049
(Duplicate)	04-Aug-2016	**460 [#1]**	---	< 0.010	< 0.010	---	0.0048	0.00082	1.3	**0.00017 [#1]**	< 0.0010	0.00083	< 0.060	< 0.00020	---	0.0019	0.0078	< 0.00020	< 0.00010	< 0.00020	0.0075	0.0035
	16-Aug-2017	**870 [#1]**	---	0.022	0.019	---	0.0047	0.0020	**2.2 [#1]**	0.000089	< 0.0010	0.00049	**< 0.60 [#1]**	< 0.00020	---	0.0025	0.0037	0.00024	< 0.00010	< 0.00020	0.0022	0.0046
MLS 09-1-3	21-Aug-2013	**1400 [#1]**	---	0.090	0.011	**30 [#1]**	< 0.0030	0.00093	0.68	**0.00017 [#1]**	< 0.0010	0.00093	< 0.060	< 0.00020	---	0.00062	0.0060	< 0.00020	< 0.00010	< 0.00020	0.0085	0.0032
	29-Jul-2014	**1700 [#1]**	---	0.31	< 0.010	**< 10 [#1]**	0.0061	0.00032	0.66	**0.00011 [#1]**	< 0.0010	0.0020	< 0.060	< 0.00020	---	0.00036	0.0066	0.00026	< 0.00010	< 0.00020	0.0089	0.0095
	08-Aug-2015	**1600 [#1]**	---	0.043	< 0.010	---	< 0.0030	0.00027	0.93	**0.000091 [#1]**	< 0.0010	0.00090	< 0.060	< 0.00020	---	0.00023	0.0042	< 0.00020	< 0.00010	< 0.00020	0.0076	0.016
	03-Aug-2016	**1700 [#1]**	---	0.041	< 0.010	---	0.0040	0.00020	0.70	**0.00025 [#1]**	< 0.0010	0.00067	< 0.060	< 0.00020	---	0.00039	0.0086	< 0.00020	< 0.00010	< 0.00020	0.0088	0.013
	16-Aug-2017	**1100 [#1]**	---	0.073	< 0.010	---	**0.58 [#1]**	0.0015	0.42	**0.00027 [#1]**	0.0012	0.0032	**1.6 [#1]**	0.0021	---	0.00027	0.0082	0.00022	< 0.00010	< 0.00020	0.0089	0.016
(Duplicate)	16-Aug-2017	**1000 [#1]**	---	0.078	< 0.010	---	**0.51 [#1]**	0.0015	0.42	**0.00026 [#1]**	0.0011	0.0023	**1.4 [#1]**	0.0017	---	0.00034	0.0076	0.00021	< 0.00010	< 0.00020	0.0089	0.015

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
MLS 09-2-3	21-Aug-2013	**600 [#1]**	---	0.0083	< 0.0030	**28 [#1]**	0.0038	0.00054	0.80	**0.00012 [#1]**	< 0.0010	0.0019	< 0.060	< 0.00020	---	0.0018	0.010	< 0.00020	< 0.00010	< 0.00020	0.011	0.0077
	29-Jul-2014	**640 [#1]**	---	0.048	< 0.010	**7.7 [#1]**	0.0065	0.00041	0.65	**0.00010 [#1]**	< 0.0010	0.0023	< 0.060	< 0.00020	---	0.0021	0.0047	< 0.00020	< 0.00010	< 0.00020	0.014	0.017
	09-Aug-2015	**630 [#1]**	---	0.012	< 0.010	---	0.0037	0.00054	0.36	**0.00015 [#1]**	< 0.0010	**0.0041 [#1]**	< 0.060	< 0.00020	---	0.0030	0.0086	< 0.00020	< 0.00010	< 0.00020	**0.018 [#1]**	0.018
	03-Aug-2016	**950 [#1]**	---	0.013	< 0.010	---	0.0044	0.00053	0.69	**0.000094 [#1]**	< 0.0010	0.0010	< 0.060	< 0.00020	---	0.0018	0.0075	< 0.00020	< 0.00010	< 0.00020	0.014	**0.035 [#1]**
	16-Aug-2017	**810 [#1]**	---	< 0.010	< 0.010	---	0.012	0.00051	0.51	0.000072	< 0.0010	0.0028	< 0.060	0.00023	---	0.0023	0.0038	0.00020	< 0.00010	< 0.00020	**0.019 [#1]**	0.024
MLS 09-3-3	19-Aug-2009	**1800 [#1]**	7.95	0.003	< 0.003	**11 [#1]**	0.002	0.0021	0.20	0.000040	< 0.001	0.0030	< 0.06	< 0.0002	---	0.016	0.0057	< 0.0002	< 0.0001	< 0.0002	0.0031	0.007
	19-Aug-2010	**630 [#1]**	7.97	0.035	0.004	**5 [#1]**	0.024	**0.0056 [#1]**	0.66	0.000014	< 0.001	0.0012	0.12	< 0.0002	---	0.0058	0.0041	0.0004	< 0.0001	< 0.0002	0.0033	0.010
(Duplicate)	19-Aug-2010	---	---	---	---	**5 [#1]**	0.003	0.0047	0.73	0.000010	0.001	0.0010	< 0.06	< 0.0002	---	0.0053	0.0044	0.0002	< 0.0001	< 0.0002	0.0039	0.007
	19-Aug-2011	**1700 [#1]**	7.93	< 0.003	< 0.003	**4 [#1]**	**0.10 [#1]**	0.004	0.23	< 0.00005	**< 0.01 [#1]**	< 0.002	0.20	< 0.002	---	0.019	< 0.005	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	0.001	< 0.03
	17-Aug-2012	**810 [#1]**	7.61	0.013	0.0037	< 2.0	0.0099	0.0032	0.94	< 0.000025	< 0.0010	0.00082	0.22	< 0.00020	---	0.0026	0.0052	< 0.00020	< 0.00010	< 0.00020	0.0051	0.011
	21-Aug-2013	**1100 [#1]**	---	0.016	0.0050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 09-4-4	19-Aug-2009	**1500 [#1]**	8.05	< 0.003	< 0.003	**47 [#1]**	0.002	**0.011 [#1]**	0.19	0.000008	**0.017 [#1]**	< 0.0002	0.21	< 0.0002	---	0.0013	0.0071	**0.0024 [#1]**	< 0.0001	< 0.0002	0.0017	0.006
	17-Aug-2012	**330 [#1]**	8.14	< 0.0030	< 0.0030	**7.8 [#1]**	0.0061	**0.022 [#1]**	0.094	< 0.000025	0.0030	0.00047	**0.89 [#1]**	< 0.00020	---	0.0066	0.0024	< 0.00020	< 0.00010	< 0.00020	0.0012	< 0.0030
	22-Aug-2013	**520 [#1]**	7.58	0.0050	< 0.0030	**27 [#1]**	0.0038	**0.0076 [#1]**	0.34	< 0.000025	< 0.0010	0.00038	**1.2 [#1]**	< 0.00020	---	0.0016	0.0067	< 0.00020	< 0.00010	< 0.00020	0.0087	< 0.0030
	29-Jul-2014	**800 [#1]**	7.67	0.015	< 0.010	**16 [#1]**	0.0045	**0.0094 [#1]**	0.068	< 0.000020	< 0.0010	0.0011	**5.2 [#1]**	< 0.00020	---	0.0016	0.0097	0.00022	< 0.00010	< 0.00020	0.0086	0.0056
MLS 09-5-3	19-Aug-2009	**450 [#1]**	7.65	0.027	< 0.003	**4 [#1]**	< 0.001	0.0011	0.41	**0.00016 [#1]**	< 0.001	**0.0047 [#1]**	< 0.06	< 0.0002	---	0.0027	0.023	0.0004	< 0.0001	< 0.0002	0.0078	0.021
	19-Aug-2010	**450 [#1]**	7.83	0.031	0.004	< 2	0.002	0.0012	0.51	**0.00014 [#1]**	< 0.001	0.0019	0.16	< 0.0002	---	0.0027	0.025	0.0003	< 0.0001	< 0.0002	0.0091	**0.065 [#1]**
	19-Aug-2011	**560 [#1]**	7.60	0.17	< 0.03	< 2	< 0.01	0.002	0.55	< 0.00005	**< 0.01 [#1]**	< 0.002	**1.0 [#1]**	< 0.002	---	< 0.002	0.023	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	0.008	< 0.03
	17-Aug-2012	**810 [#1]**	7.40	0.0079	< 0.0030	< 2.0	0.0027	0.00096	0.51	0.000047	< 0.0010	0.0012	0.20	< 0.00020	---	0.0019	0.016	0.00023	< 0.00010	< 0.00020	0.0046	0.015
	22-Aug-2013	**430 [#1]**	---	0.063	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**560 [#1]**	---	0.023	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**220 [#1]**	---	0.059	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2016	**310 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	**320 [#1]**	---	0.044	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 09-6-2	19-Aug-2009	5	8.08	0.046	0.003	3	< 0.001	0.0007	0.11	0.000069	< 0.001	0.0030	< 0.06	< 0.0002	---	0.0004	0.0040	0.0002	< 0.0001	< 0.0002	0.0020	0.008
	19-Aug-2011	9	7.92	0.091	< 0.003	---	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---	---
MLS 09-7-2	19-Aug-2010	**450 [#1]**	7.97	0.31	0.006	< 2	0.002	< 0.0002	0.21	0.000041	< 0.001	0.0020	< 0.06	< 0.0002	---	0.0009	0.0025	**0.0020 [#1]**	< 0.0001	< 0.0002	**0.015 [#1]**	0.011
	19-Aug-2011	**420 [#1]**	7.93	0.12	0.012	< 2	**0.13 [#1]**	0.0004	0.27	0.00005	< 0.001	0.0013	0.17	< 0.0002	---	0.0007	0.0022	0.0005	< 0.0001	< 0.0002	**0.015 [#1]**	0.008
	17-Aug-2012	**350 [#1]**	7.97	< 0.0030	< 0.0030	< 2.0	0.0014	0.00052	0.18	0.000046	< 0.0010	0.0015	< 0.060	< 0.00020	---	0.0013	0.0013	0.00034	< 0.00010	< 0.00020	0.013	0.0034
	21-Aug-2013	**290 [#1]**	---	0.19	0.0096	---	0.0046	0.00031	0.10	0.000071	< 0.0010	0.0015	< 0.060	< 0.00020	---	0.0010	0.0027	< 0.00020	< 0.00010	< 0.00020	0.0094	0.0038
	30-Jul-2014	**200 [#1]**	---	0.086	< 0.010	**5.3 [#1]**	0.052	0.00038	0.043	0.000043	< 0.0010	0.0033	0.16	< 0.00020	---	0.0028	0.0042	0.00040	< 0.00010	< 0.00020	0.0060	0.0091
MLS 09-8-2	19-Aug-2010	**440 [#1]**	7.91	0.048	0.005	< 2	0.006	0.0006	0.21	**0.00016 [#1]**	< 0.001	0.0023	< 0.06	< 0.0002	---	0.0006	0.0066	< 0.0002	< 0.0001	< 0.0002	0.0043	0.010
	19-Aug-2011	**590 [#1]**	7.65	0.022	0.004	2	< 0.01	< 0.002	0.22	**0.00024 [#1]**	**< 0.01 [#1]**	< 0.002	< 0.06	< 0.002	---	< 0.002	0.006	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	0.005	< 0.03
MLS 09-9-2	17-Aug-2012	**650 [#1]**	7.69	< 0.0030	< 0.0030	2.2	0.0019	0.0024	0.34	**0.00011 [#1]**	< 0.0010	0.0013	**0.44 [#1]**	< 0.00020	---	0.00044	0.0056	< 0.00020	< 0.00010	< 0.00020	0.0011	0.0043
	23-Aug-2013	**1100 [#1]**	---	0.033	< 0.015	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**1300 [#1]**	---	0.73	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Aug-2015	**1500 [#1]**	---	0.018	< 0.010	---	0.0066	0.0011	0.28	**0.00023 [#1]**	< 0.0010	0.0017	**5.4 [#1]**	< 0.00020	---	< 0.00020	0.0065	0.00024	< 0.00010	< 0.00020	0.0030	0.024
	04-Aug-2016	**1800 [#1]**	---	< 0.010	< 0.010	---	0.0038	0.0012	0.33	**0.00018 [#1]**	< 0.0010	0.00066	**3.5 [#1]**	< 0.00020	---	< 0.00020	0.0077	< 0.00020	< 0.00010	< 0.00020	0.0035	0.0049
	16-Aug-2017	**1700 [#1]**	---	0.65	0.020	---	0.0031	0.00072	0.14	**0.00029 [#1]**	< 0.0010	0.0023	**0.32 [#1]**	< 0.00020	---	0.00033	0.0046	0.00025	< 0.00010	< 0.00020	0.0066	0.0091

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date	Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
MLS 09-15-3	17-Aug-2012	880 [#1]	7.71	< 0.0030	< 0.0030	< 2.0	0.0021	0.00050	0.31	0.00044 [#1]	< 0.0010	0.0022	< 0.060	< 0.00020	---	0.00053	0.0098	0.00029	< 0.00010	< 0.00020	0.0089	0.030 [#1]
	22-Aug-2013	800 [#1]	---	0.16	0.0080	23 [#1]	0.0031	0.0014	0.36	0.00029 [#1]	< 0.0010	0.0015	< 0.060	< 0.00020	---	0.00053	0.0060	0.00026	< 0.00010	< 0.00020	0.0085	0.015
	29-Jul-2014	940 [#1]	---	0.23	< 0.010	14 [#1]	0.0074	0.00038	0.32	0.00031 [#1]	< 0.0010	0.0033	< 0.060	< 0.00020	---	0.00040	0.0069	0.00035	< 0.00010	< 0.00020	0.0074	0.042 [#1]
	09-Aug-2015	730 [#1]	---	0.031	< 0.010	---	0.0037	0.00034	0.43	0.00018 [#1]	< 0.0010	0.0032	< 0.060	< 0.00020	---	0.00040	0.0033	0.00020	< 0.00010	< 0.00020	0.0087	0.019
	03-Aug-2016	750 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	1600 [#1]	---	0.090	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS 92-1-3	17-Sep-1999	180 [#1]	7.9	0.65	0.023	---	0.06	0.002	0.442	< 0.0001 [#1]	0.005	0.003	0.033	< 0.001	< 0.00005 [#1]	< 0.004	< 0.008	< 0.001	< 0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	180 [#1]	7.8	0.14	0.008	3	< 0.02	< 0.001	0.259	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.030	< 0.001	0.00025 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	0.007
	28-Aug-2001	249 [#1]	8.2	< 0.02	< 0.005	4 [#1]	0.03	< 0.05 [#1]	0.614	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.124	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
	22-Aug-2002	203 [#1]	8.1	< 0.02	0.005	2	< 0.001	0.001	0.516	< 0.00001	< 0.001	0.0038	0.006	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	0.00142	0.010
	25-Aug-2003	257 [#1]	7.1	< 0.2	< 0.06	---	---	< 0.005	0.297	< 0.002 [#1]	< 0.007	< 0.009 [#1]	0.027	< 0.10 [#1]	< 0.00005 [#1]	---	---	< 0.001	---	---	< 1.0 [#1]	0.014
MLS 93-10-6	06-Sep-1997	485 [#1]	8.1	< 0.02	< 0.005	23 [#1]	0.16 [#1]	0.0171 [#1]	1.64 [#1]	0.002 [#1]	0.066 [#1]	0.071 [#1]	0.157	0.003	< 0.00005 [#1]	< 0.004	0.110	< 0.0005	< 0.01 [#1]	< 0.02 [#1]	---	0.338 [#1]
	07-Sep-1998	446 [#1]	8.3	< 0.02	< 0.005	9 [#1]	< 0.02	0.06 [#1]	1.37	< 0.002 [#1]	< 0.002	< 0.001	< 0.003	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	< 0.002
	18-Sep-1999	410 [#1]	7.6	< 0.02	< 0.005	---	0.02	0.004	1.28	< 0.0001 [#1]	0.002	< 0.001	0.398 [#1]	< 0.001	< 0.00005 [#1]	< 0.004	0.012	< 0.001	< 0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	620 [#1]	7.9	< 0.02	< 0.005	16 [#1]	< 0.02	0.003	1.09	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.006	< 0.001	0.00007 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	0.007
	28-Aug-2001	537 [#1]	7.9	< 0.02	< 0.005	7 [#1]	0.63 [#1]	< 0.05 [#1]	1.12	< 0.002 [#1]	< 0.005	< 0.005 [#1]	1.28 [#1]	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
MLS 93-13-7	07-Sep-1998	390 [#1]	8.4	< 0.02	0.018	---	< 0.02	0.06 [#1]	1.14	< 0.002 [#1]	< 0.002	< 0.001	0.017	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	< 0.002
	17-Sep-1999	400 [#1]	7.9	< 0.02	< 0.005	---	0.08	0.002	0.984	< 0.0001 [#1]	0.004	0.003	0.372 [#1]	< 0.001	< 0.00005 [#1]	0.005	0.012	< 0.001	< 0.0001	< 0.02 [#1]	---	0.003
	19-Sep-2000	9.7	8.1	0.05	0.005	3	< 0.02	< 0.001	0.482	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.007	< 0.001	0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	< 0.005
	22-Aug-2002	371 [#1]	8.2	< 0.02	< 0.005	6 [#1]	< 0.001	0.002	1.02	< 0.00010 [#1]	0.003	0.0072 [#1]	0.165	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	0.001 [#1]	< 0.0001	< 0.0001	0.00214	< 0.005
(Duplicate)	22-Aug-2002	327 [#1]	6.3 [#1]	< 0.02	< 0.005	5 [#1]	< 0.001	0.002	0.984	< 0.00010 [#1]	0.003	0.0091 [#1]	1.34 [#1]	< 0.0005	< 0.00005 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	0.00208	0.124 [#1]
	25-Aug-2003	525 [#1]	7.1	< 0.2	< 0.06	---	---	< 0.005	1.183	< 0.002 [#1]	< 0.007	< 0.009 [#1]	0.024	< 0.10 [#1]	< 0.00005 [#1]	---	---	< 0.001	---	---	< 1.0 [#1]	< 0.005
MLS 93-3-6	17-Sep-1999	200 [#1]	8.3	0.11	< 0.110 [#1]	---	0.11 [#1]	0.002	0.830	< 0.0001 [#1]	0.003	0.002	0.210	< 0.001	< 0.00005 [#1]	< 0.004	< 0.008	< 0.001	< 0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	160 [#1]	8.1	< 0.02	< 0.005	---	0.03	0.001	0.794	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.061	< 0.001	0.00018 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	< 0.005
	28-Aug-2001	168 [#1]	8.6	< 0.02	< 0.005	3	< 0.02	< 0.05 [#1]	0.789	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.007	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
MLS 93-4-3	28-Aug-2001	18.1	8.4	< 0.02	0.015	---	0.12 [#1]	< 0.05 [#1]	0.106	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.201	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
MLS 93-5-4	07-Sep-1998	760 [#1]	8.3	< 0.02	< 0.005	---	< 0.02	0.09 [#1]	1.24	< 0.002 [#1]	< 0.002	< 0.001	0.007	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	0.002
	17-Sep-1999	660 [#1]	7.9	0.03	0.014	---	0.18 [#1]	0.004	1.42	< 0.0001 [#1]	0.004	0.002	0.146	< 0.001	< 0.00005 [#1]	< 0.004	0.009	< 0.001	< 0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	690 [#1]	7.8	< 0.02	< 0.005	6 [#1]	0.02	< 0.001	1.45	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.064	< 0.001	0.00009 [#1]	< 0.005	< 0.008	< 0.001	0.0001	< 0.03 [#1]	---	< 0.005
	28-Aug-2001	674 [#1]	8.5	< 0.02	< 0.005	7 [#1]	< 0.02	< 0.05 [#1]	1.56 [#1]	< 0.002 [#1]	< 0.005	< 0.005 [#1]	< 0.005	< 0.03 [#1]	---	< 0.005	< 0.008	0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
(Duplicate)	28-Aug-2001	689 [#1]	8.3	< 0.02	< 0.005	5 [#1]	< 0.02	< 0.05 [#1]	1.60 [#1]	< 0.002 [#1]	< 0.005	< 0.005 [#1]	< 0.005	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
MLS 93-6-6	06-Sep-1997	323 [#1]	8.1	< 0.02	< 0.005	8 [#1]	1.92 [#1]	0.0027	0.703	< 0.002 [#1]	0.006	0.015 [#1]	5.25 [#1]	0.017 [#1]	0.00016 [#1]	< 0.004	< 0.008	< 0.0005	< 0.01 [#1]	< 0.02 [#1]	---	0.057 [#1]
	07-Sep-1998	828 [#1]	8.3	< 0.02	0.005	---	< 0.02	0.12 [#1]	0.841	< 0.002 [#1]	< 0.002	< 0.001	< 0.003	< 0.02 [#1]	---	< 0.004	< 0.008	0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	< 0.002
	18-Sep-1999	610 [#1]	7.2	< 0.02	0.019	---	0.07	0.003	0.556	< 0.0001 [#1]	0.004	0.004 [#1]	0.085	< 0.001	< 0.00005 [#1]	< 0.004	0.012	< 0.001	< 0.0001	< 0.02 [#1]	---	0.068 [#1]
	19-Sep-2000	260 [#1]	7.5	< 0.02	< 0.005	8 [#1]	< 0.02	0.002	0.367	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.094	< 0.001	0.00009 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	< 0.005
	28-Aug-2001	249 [#1]	8.2	< 0.02	< 0.005	2	0.05	< 0.05 [#1]	0.398	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.077	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005
MLS 93-7-4	06-Sep-1997	378 [#1]	7.6	< 0.02	< 0.005	9 [#1]	3.55 [#1]	0.0049	0.608	< 0.002 [#1]	0.007	0.019 [#1]	9.50 [#1]	0.010 [#1]	< 0.00005 [#1]	< 0.004	0.012	< 0.0005	< 0.01 [#1]	< 0.02 [#1]	---	0.051 [#1]
	07-Sep-1998	863 [#1]	8.1	< 0.02	< 0.005	14 [#1]	< 0.02	0.05 [#1]	0.681	< 0.002 [#1]	< 0.002	< 0.001	< 0.003	< 0.02 [#1]	---	< 0.004	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.02 [#1]	---	< 0.002
	18-Sep-1999	400 [#1]	7.4	0.02	0.006	---	0.04	0.002	0.285	< 0.0001 [#1]	0.007	0.003	0.020	< 0.001	< 0.00005 [#1]	< 0.004	0.015	< 0.001	< 0.0001	< 0.02 [#1]	---	< 0.002
	19-Sep-2000	320 [#1]	7.7	< 0.02	< 0.005	7 [#1]	< 0.02	0.006 [#1]	0.719	< 0.0001 [#1]	< 0.005	< 0.005 [#1]	0.009	< 0.001	0.00023 [#1]	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.03 [#1]	---	0.006
	28-Aug-2001	469 [#1]	7.9	< 0.02	< 0.005	2	0.02	< 0.05 [#1]	0.450	< 0.002 [#1]	< 0.005	< 0.005 [#1]	0.050	< 0.03 [#1]	---	< 0.005	< 0.008	< 0.03 [#1]	< 0.01 [#1]	< 0.03 [#1]	---	< 0.005

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date	Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
MLS 93-8-7	07-Sep-1998	**2290 [#1]**	7.9	< 0.02	< 0.005	---	< 0.02	**< 0.04 [#1]**	1.23	**< 0.0010 [#1]**	0.004	< 0.001	0.088	**0.02 [#1]**	**< 0.00005 [#1]**	< 0.004	< 0.008	< 0.001	< 0.0001	**< 0.002 [#1]**	---	< 0.002
	20-Oct-1998	---	---	---	---	**31 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-1999	**2100 [#1]**	7.3	0.02	< 0.005	---	0.04	0.004	0.812	**< 0.0001 [#1]**	0.005	< 0.001	**0.612 [#1]**	< 0.001	**< 0.00005 [#1]**	< 0.004	0.016	< 0.001	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	19-Sep-2000	**2400 [#1]**	7.4	< 0.02	< 0.005	**25 [#1]**	< 0.02	< 0.001	0.842	**< 0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	**0.457 [#1]**	< 0.001	**0.00009 [#1]**	< 0.005	< 0.008	< 0.001	< 0.0001	**< 0.03 [#1]**	---	< 0.005
	28-Aug-2001	**2550 [#1]**	7.5	0.03	< 0.005	**32 [#1]**	< 0.02	**< 0.05 [#1]**	0.786	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.007	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
MLS 93-9-6	07-Sep-1998	**1880 [#1]**	8.3	0.02	< 0.005	---	< 0.02	**< 0.04 [#1]**	**1.54 [#1]**	**< 0.0010 [#1]**	< 0.002	< 0.001	0.054	**< 0.02 [#1]**	**< 0.00005 [#1]**	< 0.004	< 0.008	< 0.001	< 0.0001	**< 0.002 [#1]**	---	< 0.002
	20-Oct-1998	---	---	---	---	**25 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-1999	**2000 [#1]**	7.4	< 0.02	< 0.005	---	**0.11 [#1]**	**0.013 [#1]**	1.30	**0.0004 [#1]**	0.005	0.002	**1.65 [#1]**	0.001	**< 0.00005 [#1]**	< 0.004	0.010	< 0.001	**0.0004 [#1]**	**< 0.02 [#1]**	---	0.002
(Duplicate)	18-Sep-1999	**1900 [#1]**	7.5	< 0.02	< 0.005	---	**0.10 [#1]**	**0.013 [#1]**	1.32	**< 0.0001 [#1]**	0.004	0.002	**1.64 [#1]**	< 0.001	**< 0.00005 [#1]**	< 0.004	< 0.008	< 0.001	< 0.0001	**< 0.02 [#1]**	---	< 0.002
	19-Sep-2000	**2100 [#1]**	7.8	< 0.02	< 0.005	**28 [#1]**	< 0.02	0.001	1.27	**< 0.0001 [#1]**	< 0.005	**< 0.005 [#1]**	**0.640 [#1]**	< 0.001	**0.00016 [#1]**	< 0.005	< 0.008	< 0.001	< 0.0001	**< 0.03 [#1]**	---	0.009
	28-Aug-2001	**2110 [#1]**	8.0	< 0.02	< 0.005	**44 [#1]**	0.07	**< 0.05 [#1]**	1.35	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.178	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
MLS 97-12-4	19-Aug-2008	69	7.8	0.12	< 0.003	3	0.004	< 0.001	---	0.00005	< 0.001	**0.0059 [#1]**	< 0.06	< 0.0002	---	0.0002	0.0030	< 0.001	< 0.0001	< 0.0002	0.010	**0.086 [#1]**
	19-Aug-2009	97	7.88	0.15	< 0.003	**7 [#1]**	< 0.001	< 0.0002	0.11	**0.00019 [#1]**	< 0.001	**0.0050 [#1]**	< 0.06	< 0.0002	---	0.0011	0.0024	0.0002	< 0.0001	< 0.0002	0.011	0.011
	19-Aug-2011	87	---	0.05	< 0.03	2	< 0.01	< 0.002	0.15	**0.00016 [#1]**	**< 0.01 [#1]**	< 0.002	< 0.06	< 0.002	---	< 0.002	< 0.005	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	**0.016 [#1]**	< 0.03
	31-Jul-2014	---	---	---	---	---	0.015	0.00059	0.12	0.000067	< 0.0010	0.0023	< 0.060	< 0.00020	---	0.0017	0.0031	0.00076	< 0.00010	< 0.00020	**0.016 [#1]**	0.0087
	06-Aug-2015	---	---	---	---	---	< 0.0030	0.00043	0.13	**0.00019 [#1]**	< 0.0010	0.0021	< 0.060	< 0.00020	---	0.0013	0.0036	0.00025	< 0.00010	< 0.00020	0.014	0.0050
MLS 98-11-2	28-Aug-2001	**328 [#1]**	7.7	0.02	< 0.005	**7 [#1]**	0.03	**< 0.05 [#1]**	0.070	**< 0.002 [#1]**	< 0.005	**< 0.005 [#1]**	0.007	**< 0.03 [#1]**	---	< 0.005	< 0.008	**< 0.03 [#1]**	**< 0.01 [#1]**	**< 0.03 [#1]**	---	< 0.005
	23-Aug-2002	**343 [#1]**	8.2	0.06	< 0.005	**7 [#1]**	0.083	< 0.001	0.046	0.00005	< 0.001	**0.0085 [#1]**	0.216	0.0007	**< 0.00005 [#1]**	< 0.005	< 0.008	< 0.001	< 0.0001	< 0.0001	0.00267	0.017
	25-Aug-2003	**442 [#1]**	**6.4 [#1]**	< 0.2	< 0.06	---	---	< 0.005	< 0.050	**< 0.002 [#1]**	< 0.007	**< 0.009 [#1]**	0.298	**< 0.10 [#1]**	**< 0.00005 [#1]**	---	---	< 0.001	---	---	**< 1.0 [#1]**	0.009
	24-Aug-2004	**361 [#1]**	---	< 0.2	< 0.06	---	0.012	**< 0.010 [#1]**	0.010	**0.000110 [#1]**	< 0.005	**0.015 [#1]**	0.014	< 0.002	**< 0.00005 [#1]**	< 0.005	< 0.008	**< 0.002 [#1]**	< 0.0002	**< 0.0016 [#1]**	< 0.002	< 0.005
	27-Aug-2005	**328 [#1]**	7.8	< 0.2	< 0.06	**11 [#1]**	< 0.005	< 0.005	< 0.05	0.00007	< 0.007	**0.009 [#1]**	0.046	< 0.001	**< 0.00005 [#1]**	< 0.006	< 0.008	**0.001 [#1]**	< 0.0001	< 0.0008	< 0.001	**0.093 [#1]**
MLS SW01	23-Aug-2013	**380 [#1]**	---	0.011	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**350 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**180 [#1]**	---	0.031	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Jun-2016	**530 [#1]**	7.86	---	---	**7.0 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	110	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS SW02	19-Aug-2011	**120 [#1]**	7.51	0.06	< 0.03	**10 [#1]**	---	---	---	---	---	---	**0.61 [#1]**	---	---	---	---	---	---	---	---	---
	17-Aug-2012	37	7.45	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	**2.3 [#1]**	---	---	---	---	---	---	---	---	---
	21-Aug-2013	30	---	0.0075	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Jul-2014	7.5	---	0.029	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Jun-2016	36	7.90	---	---	**11 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS SW03	20-Aug-2009	19	8.18	0.26	**0.073 [#1]**	< 2	---	---	---	---	---	---	0.24	---	---	---	---	---	---	---	---	---
	19-Aug-2010	48	7.98	< 0.003	< 0.003	< 2	---	---	---	---	---	---	0.21	---	---	---	---	---	---	---	---	---
	19-Aug-2011	3	6.82	0.04	< 0.03	< 2	---	---	---	---	---	---	0.21	---	---	---	---	---	---	---	---	---
	17-Aug-2012	2.6	7.61	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	0.10	---	---	---	---	---	---	---	---	---
	09-Jun-2016	**1200 [#1]**	7.90	---	---	**19 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS SW04	19-Aug-2011	**460 [#1]**	7.88	0.07	< 0.03	< 2	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---	---
	17-Aug-2012	**500 [#1]**	8.05	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	0.078	---	---	---	---	---	---	---	---	---
	22-Aug-2013	**390 [#1]**	---	0.0077	< 0.0030	**19 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	**320 [#1]**	---	0.028	< 0.010	**17 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**380 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

		Inorganic Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date	Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
MLS SW05	29-Jul-2014	**840 [#1]**	---	< 0.010	< 0.010	**22 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	88	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Jun-2016	75	8.21	---	---	**5.9 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**140 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Aug-2017	73	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS SW06	17-Aug-2012	**280 [#1]**	8.04	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	23-Aug-2013	**210 [#1]**	---	0.0032	< 0.0030	**14 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Jul-2014	91	---	< 0.010	< 0.010	**13 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Aug-2015	**120 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2016	**190 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS SW07	19-Aug-2011	**1800 [#1]**	8.40	0.04	< 0.03	< 2	---	---	---	---	---	---	0.10	---	---	---	---	---	---	---	---	---
	17-Aug-2012	**1600 [#1]**	8.10	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	0.072	---	---	---	---	---	---	---	---	---
	22-Aug-2013	**1300 [#1]**	8.00	0.043	< 0.0030	**31 [#1]**	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
MLS-10-1-7	22-Aug-2013	**500 [#1]**	---	0.061	< 0.015	**23 [#1]**	< 0.0030	0.0020	1.2	0.000030	< 0.0010	0.0010	**0.51 [#1]**	< 0.00020	---	< 0.00020	0.00092	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0031
(Duplicate)	22-Aug-2013	**500 [#1]**	---	0.035	< 0.015	**24 [#1]**	< 0.0030	0.0022	1.2	0.000035	< 0.0010	0.00094	**0.44 [#1]**	< 0.00020	---	< 0.00020	0.00090	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0030
	29-Jul-2014	**570 [#1]**	---	< 0.010	< 0.010	**9.8 [#1]**	0.0080	0.00061	1.3	< 0.000025	< 0.0010	0.0013	**0.44 [#1]**	< 0.00020	---	< 0.00020	0.0010	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0038
(Duplicate)	29-Jul-2014	**550 [#1]**	---	0.013	< 0.010	**13 [#1]**	0.0061	0.00053	1.3	< 0.000020	< 0.0010	0.00084	**0.41 [#1]**	< 0.00020	---	< 0.00020	0.00075	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0037
	09-Aug-2015	**630 [#1]**	---	< 0.010	< 0.010	---	< 0.0030	0.0011	1.3	< 0.000020	< 0.0010	0.0022	**0.82 [#1]**	< 0.00020	---	0.00021	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0049
(Duplicate)	09-Aug-2015	---	---	---	---	---	< 0.0030	0.0011	1.3	< 0.000020	< 0.0010	0.0022	**0.73 [#1]**	< 0.00020	---	0.00024	0.00068	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0090
	04-Aug-2016	**630 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Aug-2016	**620 [#1]**	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	16-Aug-2017	**620 [#1]**	---	< 0.10	**< 0.10 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2017	**640 [#1]**	---	0.22	**< 0.10 [#1]**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MLS-10-2-3	23-Aug-2013	**200 [#1]**	---	0.13	0.0090	**17 [#1]**	0.0054	**0.0072 [#1]**	**2.0 [#1]**	0.000034	< 0.0010	0.00025	**0.49 [#1]**	< 0.00020	---	0.00065	0.0096	0.00028	< 0.00010	< 0.00020	0.0068	0.0035
(Duplicate)	23-Aug-2013	**200 [#1]**	---	0.14	0.012	**< 10 [#1]**	0.0046	**0.0069 [#1]**	**2.0 [#1]**	0.000026	< 0.0010	< 0.00020	**0.49 [#1]**	< 0.00020	---	0.00041	0.0075	0.00030	< 0.00010	< 0.00020	0.0067	< 0.0030
	29-Jul-2014	**180 [#1]**	---	0.043	< 0.010	**8.2 [#1]**	0.0045	0.0036	**1.9 [#1]**	< 0.000025	< 0.0010	0.00058	**0.54 [#1]**	< 0.00020	---	0.00032	0.0054	0.00040	< 0.00010	< 0.00020	0.0043	0.0037
(Duplicate)	29-Jul-2014	**180 [#1]**	---	0.043	< 0.010	**8.9 [#1]**	0.0050	0.0034	**1.9 [#1]**	< 0.000025	< 0.0010	0.0017	**0.54 [#1]**	< 0.00020	---	0.00031	0.0065	0.00026	< 0.00010	< 0.00020	0.0042	0.0056
	07-Aug-2015	**180 [#1]**	---	0.16	0.011	---	< 0.0030	0.0019	**1.5 [#1]**	< 0.000020	< 0.0010	< 0.00020	0.070	< 0.00020	---	0.00022	0.0031	0.00071	< 0.00010	< 0.00020	0.0042	0.0073
(Duplicate)	07-Aug-2015	---	---	---	---	---	< 0.0030	0.0016	**1.5 [#1]**	< 0.000020	< 0.0010	< 0.00020	< 0.060	< 0.00020	---	0.00025	0.0032	0.00053	< 0.00010	< 0.00020	0.0041	0.014
	04-Aug-2016	**190 [#1]**	---	< 0.010	< 0.010	---	0.0042	0.0019	**1.7 [#1]**	< 0.000020	< 0.0010	0.00043	0.25	< 0.00020	---	0.00052	0.0062	0.00027	< 0.00010	< 0.00020	0.0066	0.0067
	16-Aug-2017	**240 [#1]**	---	< 0.10	**< 0.10 [#1]**	---	0.0033	0.0019	**2.0 [#1]**	< 0.000020	< 0.0010	< 0.00020	**0.74 [#1]**	< 0.00020	---	0.00029	0.0085	**0.0013 [#1]**	< 0.00010	< 0.00020	0.0075	0.0058
MLS-12-1	06-Aug-2012	**1600 [#1]**	8.10	0.023	< 0.0030	< 2.0	< 0.010	0.0027	0.15	0.000069	**< 0.010 [#1]**	< 0.0020	0.076	< 0.0020	---	< 0.0020	< 0.0050	**< 0.0020 [#1]**	**< 0.0010 [#1]**	**< 0.0020 [#1]**	0.0012	< 0.030
MLS-13-1-3	18-Sep-2013	**140 [#1]**	7.41	0.050	0.011	**10 [#1]**	< 0.0030	0.00068	0.27	**0.00040 [#1]**	< 0.0010	0.0022	< 0.060	< 0.00020	---	0.0096	0.024	0.00042	< 0.00010	< 0.00020	**0.024 [#1]**	0.011
	29-Jul-2014	**160 [#1]**	7.52	< 0.010	0.016	3.9	0.0090	0.00068	0.23	**0.00044 [#1]**	< 0.0010	0.0024	0.082	< 0.00020	---	0.0058	0.022	0.00032	< 0.00010	< 0.00020	**0.024 [#1]**	0.011
	06-Aug-2015	**150 [#1]**	7.36	0.049	0.018	**5.3 [#1]**	0.0092	0.00045	0.37	**0.00032 [#1]**	< 0.0010	**0.0052 [#1]**	< 0.060	< 0.00020	---	0.0065	0.012	0.00095	< 0.00010	< 0.00020	**0.025 [#1]**	0.015
	04-Aug-2016	**190 [#1]**	7.94	0.024	0.018	**6.0 [#1]**	0.0056	0.00049	0.22	**0.00023 [#1]**	< 0.0010	0.0022	0.19	< 0.00020	---	0.010	0.015	0.00036	< 0.00010	< 0.00020	0.014	0.0083
	16-Aug-2017	**170 [#1]**	---	0.15	< 0.010	**5.2 [#1]**	0.0068	0.00050	0.23	**0.00024 [#1]**	0.0010	**0.0064 [#1]**	< 0.060	< 0.00020	---	0.0063	0.012	0.00035	< 0.00010	< 0.00020	**0.027 [#1]**	0.011
MLS-13-2-3	08-Aug-2015	**130 [#1]**	7.63	< 0.010	< 0.010	< 2.0	0.0073	0.0019	0.52	**0.00012 [#1]**	< 0.0010	0.0029	0.28	< 0.00020	---	0.0070	0.013	0.00048	< 0.00010	< 0.00020	**0.016 [#1]**	0.0074
	03-Aug-2016	**160 [#1]**	7.96	0.19	0.032	**7.3 [#1]**	0.0083	0.0011	0.38	0.000077	< 0.0010	**0.0041 [#1]**	< 0.060	< 0.00020	---	0.0052	0.0075	0.00044	< 0.00010	< 0.00020	**0.015 [#1]**	0.011
	16-Aug-2017	**170 [#1]**	---	0.17	< 0.010	3.2	0.0086	0.00074	0.41	**0.00011 [#1]**	< 0.0010	**0.0089 [#1]**	< 0.060	< 0.00020	---	0.0043	0.0060	0.00028	< 0.00010	< 0.00020	0.011	0.0095

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date	Inorganic Parameters and Phenols					Dissolved Metals															
		Chloride	pH	Nitrate (as N)	Nitrite (as N)	Phenols	Aluminum	Arsenic	Boron	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Zinc
	(dd-mmm-yyyy)	(mg/L)	(pH Units)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
MLS-13-3-3	18-Sep-2013	46	7.60	0.40	0.011	< 2.0	< 0.0030	0.00032	0.46	0.000042	< 0.0010	0.0020	< 0.060	< 0.00020	---	0.00049	0.0038	**0.0014 [#1]**	< 0.00010	< 0.00020	0.0024	0.0091
	29-Jul-2014	**220 [#1]**	7.54	0.018	< 0.010	**4.9 [#1]**	0.0039	0.00035	0.23	0.000047	< 0.0010	0.0017	< 0.060	< 0.00020	---	0.00048	0.0020	0.00033	< 0.00010	< 0.00020	0.0043	0.0072
	07-Aug-2015	**290 [#1]**	7.37	0.012	< 0.010	< 2.0	0.0040	0.00036	0.28	0.000081	< 0.0010	0.0017	< 0.060	< 0.00020	---	0.0016	0.017	0.00024	< 0.00010	< 0.00020	0.0047	0.014
	05-Aug-2016	**280 [#1]**	7.48	< 0.010	< 0.010	< 2.0	0.0034	< 0.00020	0.17	0.000073	< 0.0010	0.00056	< 0.060	< 0.00020	---	0.00050	0.033	< 0.00020	< 0.00010	< 0.00020	0.0039	0.0072
	16-Aug-2017	**370 [#1]**	---	0.018	< 0.010	**4.1 [#1]**	< 0.0030	0.00034	0.19	0.000054	< 0.0010	0.00085	< 0.060	< 0.00020	---	0.00054	0.0056	< 0.00020	< 0.00010	< 0.00020	0.0041	0.0072
MLS-13-4-3	18-Sep-2013	12	7.17	< 0.0030	< 0.0030	**13 [#1]**	0.027	0.0020	0.37	< 0.000025	< 0.0010	0.00047	**4.3 [#1]**	< 0.00020	---	0.0020	0.029	< 0.00020	< 0.00010	< 0.00020	0.0049	0.0089
	29-Jul-2014	5.7	7.31	< 0.010	< 0.010	**8.5 [#1]**	0.0088	0.0023	0.26	< 0.000025	< 0.0010	0.0021	**1.7 [#1]**	< 0.00020	---	0.00065	0.012	0.00034	< 0.00010	< 0.00020	0.0025	0.0056
	07-Aug-2015	4.8	7.23	< 0.010	< 0.010	< 2.0	0.040	0.0049	0.23	0.000025	< 0.0010	0.00051	**7.8 [#1]**	< 0.00020	---	0.00038	0.0089	**0.0012 [#1]**	< 0.00010	< 0.00020	0.0031	0.0099
	05-Aug-2016	3.9	7.36	< 0.010	< 0.010	2.5	0.0072	0.0034	0.15	< 0.000020	< 0.0010	0.00040	**3.0 [#1]**	< 0.00020	---	0.00052	0.0083	< 0.00020	< 0.00010	< 0.00020	0.0021	0.0067
	16-Aug-2017	3.4	---	< 0.010	< 0.010	**4.4 [#1]**	0.0082	**0.0065 [#1]**	0.23	< 0.000020	< 0.0010	0.00068	**8.1 [#1]**	< 0.00020	---	0.00034	0.0096	< 0.00020	< 0.00010	< 0.00020	0.0034	0.0071
MLS-13-9-3	09-Aug-2015	2.4	7.58	0.081	0.015	< 2.0	0.0030	0.00027	0.021	0.000051	< 0.0010	0.0036	< 0.060	< 0.00020	---	0.0025	0.0091	< 0.00020	< 0.00010	< 0.00020	0.0023	0.0098
	03-Aug-2016	< 1.0	8.00	0.072	< 0.010	< 2.0	0.0053	0.00024	0.024	< 0.000020	< 0.0010	0.0014	< 0.060	< 0.00020	---	0.0028	0.0060	< 0.00020	< 0.00010	< 0.00020	0.0027	0.0059
	16-Aug-2017	1.4	---	0.43	< 0.010	**5.5 [#1]**	0.0086	0.00040	< 0.020	0.000020	< 0.0010	**0.0046 [#1]**	< 0.060	< 0.00020	---	0.0017	0.0026	< 0.00020	< 0.00010	< 0.00020	0.0023	0.0037
MLS-14-2-3	30-Jul-2014	3.9	7.22	< 0.010	< 0.010	**64 [#1]**	0.0084	0.0015	0.045	**0.00013 [#1]**	< 0.0010	0.0016	**1.6 [#1]**	< 0.00020	---	0.00037	0.0054	0.00062	< 0.00010	< 0.00020	0.00095	0.0067
	08-Aug-2015	3.6	7.41	< 0.010	0.025	**28 [#1]**	< 0.0030	0.0021	0.070	< 0.000020	< 0.0010	< 0.00020	**0.86 [#1]**	< 0.00020	---	0.00047	0.0040	**0.0023 [#1]**	< 0.00010	< 0.00020	0.0013	< 0.0030
	03-Aug-2016	6.7	7.46	0.016	< 0.010	**27 [#1]**	0.016	**0.019 [#1]**	0.12	< 0.000020	< 0.0010	0.00038	**8.9 [#1]**	0.00032	---	0.0011	0.020	0.00032	< 0.00010	< 0.00020	0.00086	0.0075
	16-Aug-2017	2.0	---	< 0.010	< 0.010	**35 [#1]**	0.019	**0.0098 [#1]**	0.032	< 0.000020	< 0.0010	0.00062	**19 [#1]**	< 0.00020	---	0.00051	0.011	0.00021	< 0.00010	< 0.00020	0.00040	0.0073
MLS-14-3-3	30-Jul-2014	18	7.87	< 0.010	< 0.010	**13 [#1]**	0.021	0.00074	0.098	0.000024	< 0.0010	0.0013	0.22	< 0.00020	---	0.0013	0.0044	0.00041	< 0.00010	< 0.00020	0.0017	< 0.0030
	08-Aug-2015	15	7.66	0.039	< 0.010	< 2.0	< 0.0030	0.0016	0.12	< 0.000020	< 0.0010	< 0.00020	**0.70 [#1]**	< 0.00020	---	0.00072	0.0027	0.00037	< 0.00010	< 0.00020	0.0015	0.0066
	03-Aug-2016	17	7.89	0.16	< 0.010	3.7	0.0039	0.00044	0.17	0.000034	< 0.0010	0.0010	< 0.060	< 0.00020	---	0.00045	0.0020	< 0.00020	< 0.00010	< 0.00020	0.0016	0.0064
MLS-14-3-SW	16-Aug-2017	2.9	---	0.010	< 0.010	**19 [#1]**	0.038	0.0011	< 0.020	0.000036	< 0.0010	0.0034	0.11	< 0.00020	---	0.00047	0.0024	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0063
MLS-14-4-3	30-Jul-2014	13	8.06	0.014	< 0.010	3.8	0.012	0.00040	0.079	< 0.000020	< 0.0010	0.0037	< 0.060	< 0.00020	---	0.0019	0.0010	0.00042	< 0.00010	< 0.00020	0.0024	< 0.0030
	08-Aug-2015	19	7.79	0.012	< 0.010	< 2.0	< 0.0030	0.00045	0.17	< 0.000020	< 0.0010	< 0.00020	< 0.060	< 0.00020	---	0.0017	0.0052	0.00034	< 0.00010	< 0.00020	0.0022	< 0.0030
	03-Aug-2016	24	8.11	0.12	< 0.010	**5.8 [#1]**	0.0053	0.00058	0.21	< 0.000020	< 0.0010	0.00053	< 0.060	< 0.00020	---	0.00074	0.0017	< 0.00020	< 0.00010	< 0.00020	0.0019	0.0036
(Duplicate)	03-Aug-2016	26	8.09	0.087	< 0.010	2.8	0.0038	0.00050	0.20	< 0.000020	< 0.0010	0.00062	< 0.060	< 0.00020	---	0.00073	0.0018	< 0.00020	< 0.00010	< 0.00020	0.0019	0.0055
MLS-14-4-SW	16-Aug-2017	2.2	---	< 0.010	< 0.010	**16 [#1]**	0.023	0.0015	< 0.020	0.000033	< 0.0010	0.0015	0.15	0.00022	---	0.00027	0.0019	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0066
(Duplicate)	16-Aug-2017	2.2	---	< 0.010	< 0.010	**17 [#1]**	0.021	0.0015	< 0.020	0.000021	**0.026 [#1]**	0.00094	0.24	< 0.00020	---	0.00056	0.0098	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0053
MLS-14-5-4	30-Jul-2014	**130 [#1]**	7.85	0.59	< 0.010	3.0	0.0061	0.00038	0.22	**0.00014 [#1]**	0.0011	**0.045 [#1]**	< 0.060	< 0.00020	---	0.0016	0.0041	**0.0018 [#1]**	< 0.00010	< 0.00020	0.0038	0.011
	08-Aug-2015	110	7.73	0.025	< 0.010	< 2.0	< 0.0030	0.00052	0.24	< 0.000020	< 0.0010	0.00022	0.099	< 0.00020	---	0.00076	0.0025	< 0.00020	< 0.00010	< 0.00020	0.0031	0.0068
	03-Aug-2016	100	7.83	0.085	< 0.010	3.2	0.0042	0.00060	0.25	< 0.000020	< 0.0010	< 0.00020	0.16	< 0.00020	---	0.00070	0.0026	< 0.00020	< 0.00010	< 0.00020	0.0034	0.0083
	16-Aug-2017	110	---	0.010	< 0.010	3.5	0.0036	0.00061	0.25	< 0.000020	< 0.0010	0.0013	**0.82 [#1]**	< 0.00020	---	0.00063	0.0036	< 0.00020	< 0.00010	< 0.00020	0.0034	**0.039 [#1]**
MLS-14-8-3	29-Jul-2014	2.8	7.94	0.017	< 0.010	**5.7 [#1]**	0.0055	0.00083	0.11	0.000063	< 0.0010	0.0020	0.21	< 0.00020	---	0.0011	0.0022	< 0.00020	< 0.00010	< 0.00020	0.0016	0.0039
	04-Aug-2016	8.7	7.65	0.021	0.012	**7.8 [#1]**	0.0051	0.0044	0.20	0.000058	< 0.0010	0.00064	< 0.060	0.00023	---	0.00082	0.0055	< 0.00020	< 0.00010	< 0.00020	0.0028	0.0066
MLS-14-8-SW	21-Aug-2017	4.5	---	< 0.010	< 0.010	**13 [#1]**	---	---	---	---	---	---	**0.45 [#1]**	---	---	---	---	---	---	---	---	---
MLS-14-9-3	04-Aug-2016	23	8.27	0.32	< 0.010	3.3	0.0051	0.0032	0.28	< 0.000020	< 0.0010	0.00029	**0.88 [#1]**	< 0.00020	---	0.00098	0.0029	0.00073	< 0.00010	< 0.00020	0.0019	0.0044
MLS-14-9-SW	16-Aug-2017	1.9	---	< 0.010	< 0.010	**21 [#1]**	0.0092	0.0026	0.027	< 0.000020	< 0.0010	0.0011	**0.48 [#1]**	< 0.00020	---	0.0016	0.0025	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0048

NOTES: 1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Total Metals

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
MLS 97-12-4	15-Jul-1997	**0.38 [#1]**	**< 0.04 [#1]**	0.15	**< 0.002 [#1]**	0.008	< 0.002	**0.61 [#1]**	**< 0.03 [#1]**	< 0.004	< 0.01	**< 0.03 [#1]**	**< 0.03 [#1]**	**< 0.03 [#1]**	---	< 0.01
MLS SW02	19-Aug-2011	**0.79 [#1]**	**0.005 [#1]**	0.11	**0.00016 [#1]**	**< 0.01 [#1]**	**0.005 [#1]**	**11 [#1]**	< 0.002	< 0.002	0.008	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	0.001	**0.04 [#1]**
	17-Aug-2012	**0.15 [#1]**	0.0048	< 0.020	< 0.000025	< 0.0010	0.0017	**33 [#1]**	0.00028	0.00031	0.0043	< 0.00020	< 0.00010	< 0.00020	0.00011	0.015
	21-Aug-2013	**0.15 [#1]**	**0.0066 [#1]**	< 0.020	< 0.000025	< 0.0010	0.0019	**13 [#1]**	0.00040	0.00098	0.0059	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0093
	30-Jul-2014	0.069	0.0013	< 0.020	< 0.000020	< 0.0010	0.00075	**1.5 [#1]**	< 0.00020	0.00031	0.0025	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.015
	09-Aug-2015	0.071	0.0017	< 0.020	< 0.000020	< 0.0010	0.00040	**5.4 [#1]**	< 0.00020	< 0.00020	0.0018	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0035
MLS SW03	20-Aug-2009	**0.10 [#1]**	0.001	0.06	< 0.00003	< 0.005	< 0.001	**0.38 [#1]**	< 0.001	< 0.001	< 0.003	< 0.001	**< 0.0005 [#1]**	**< 0.001 [#1]**	< 0.0005	< 0.02
	19-Aug-2010	0.020	0.0028	< 0.02	< 0.000005	< 0.001	0.0007	**0.67 [#1]**	< 0.0002	< 0.0002	0.0021	< 0.0002	< 0.0001	< 0.0002	0.0003	< 0.003
	19-Aug-2011	0.08	< 0.002	< 0.02	**0.00009 [#1]**	**< 0.01 [#1]**	< 0.002	**0.84 [#1]**	< 0.002	< 0.002	< 0.005	**< 0.002 [#1]**	**< 0.001 [#1]**	**< 0.002 [#1]**	< 0.001	**0.04 [#1]**
	17-Aug-2012	0.012	0.00059	< 0.020	< 0.000025	< 0.0010	0.00047	**0.96 [#1]**	< 0.00020	< 0.00020	0.00068	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.012
MLS SW05	22-Aug-2013	0.015	0.00092	< 0.020	< 0.000025	< 0.0010	0.00099	0.078	< 0.00020	0.0010	0.0042	0.00047	< 0.00010	< 0.00020	0.0059	0.0033
	29-Jul-2014	**3.5 [#1]**	**0.0054 [#1]**	< 0.020	**0.0010 [#1]**	0.0057	**0.033 [#1]**	**10 [#1]**	0.0035	0.0050	0.083	**0.0028 [#1]**	< 0.00010	< 0.00020	**0.016 [#1]**	**0.20 [#1]**
	09-Aug-2015	0.013	0.0017	0.025	0.000033	< 0.0010	0.0010	**0.64 [#1]**	< 0.00020	0.0059	0.0035	0.00062	< 0.00010	< 0.00020	0.0016	< 0.0030
	04-Aug-2016	0.079	0.0023	0.025	< 0.000020	< 0.0010	0.00048	**1.4 [#1]**	< 0.00020	0.0035	0.0028	0.00063	< 0.00010	< 0.00020	0.0019	< 0.0030
	21-Aug-2017	0.089	0.0014	0.037	< 0.000020	< 0.0010	0.00053	**0.54 [#1]**	< 0.00020	0.0052	0.0038	0.00040	< 0.00010	< 0.00020	0.0021	< 0.0030
MLS-12-1	06-Aug-2012	**0.50 [#1]**	0.0043	0.15	0.000078	**< 0.010 [#1]**	0.0023	**1.5 [#1]**	< 0.0020	< 0.0020	< 0.0050	**< 0.0020 [#1]**	**< 0.0010 [#1]**	**< 0.0020 [#1]**	0.0013	< 0.030
MLS-14-3-SW	16-Aug-2017	**0.25 [#1]**	0.0013	< 0.020	0.000046	< 0.0010	0.0028	**0.47 [#1]**	0.00021	0.00049	0.0029	< 0.00020	< 0.00010	< 0.00020	< 0.00010	**0.039 [#1]**
MLS-14-4-SW	16-Aug-2017	0.034	0.0017	< 0.020	< 0.000020	< 0.0010	0.0010	0.26	< 0.00020	0.00036	0.0026	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0053
(Duplicate)	16-Aug-2017	0.038	0.0016	< 0.020	< 0.000020	< 0.0010	0.0016	0.24	< 0.00020	0.00028	0.0027	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0070
MLS-14-8-SW	21-Aug-2017	0.064	0.0027	0.021	< 0.000020	< 0.0010	0.0013	**0.63 [#1]**	< 0.00020	0.00048	0.0024	0.00026	< 0.00010	< 0.00020	0.00011	< 0.0030
MLS-14-9-SW	16-Aug-2017	0.016	0.0028	0.023	< 0.000020	< 0.0010	0.00077	**0.63 [#1]**	< 0.00020	0.0016	0.0023	0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030

NOTES:
1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
MLS 02-10-8	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.3	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.3	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 02-5-8	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	0.27	0.4	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	0.26	0.3	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.3	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.4	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.31	0.34	---	---	---	---	---	---	---	---	---
MLS 02-6-9	26-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	26-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.2	0.2	---	---	---	---	---	---	---	---	---
	27-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	0.21	0.2	---	---	---	---	---	---	---	---	---
	22-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	22-Aug-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
MLS 02-7-7	22-Aug-2007	0.322	**0.0401 [#1]**	0.0031	0.0130	< 0.1	0.6	---	---	---	---	---	---	---	---	---
	19-Aug-2008	0.22	**0.011 [#1]**	0.0016	0.0074	< 0.1	0.5	---	---	---	---	---	---	---	---	---
	19-Aug-2010	0.065	**0.0026 [#1]**	0.0008	0.0031	< 0.1	0.4	---	---	---	---	---	---	---	---	---
	19-Aug-2011	0.042	0.0014	0.0004	0.0021	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 02-8-8	19-Aug-2011	0.024	0.0012	< 0.0004	< 0.0008	0.14	0.3	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2011	0.024	0.0013	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	17-Aug-2012	0.05	0.0018	0.00072	0.0024	< 0.1	0.28	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Aug-2012	0.048	0.0018	0.00068	0.0023	< 0.1	0.21	---	---	---	---	---	---	---	---	---
	07-Aug-2015	0.0069	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.38	---	---	---	---	---	---	---	---	---
(Duplicate)	07-Aug-2015	0.0065	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.40	---	---	---	---	---	---	---	---	---
	04-Aug-2016	0.058	0.0019	0.00054	0.0032	< 0.1	0.25	---	---	---	---	---	---	---	---	---
(Duplicate)	04-Aug-2016	0.06	0.0019	0.00058	0.0034	< 0.1	0.28	---	---	---	---	---	---	---	---	---
	16-Aug-2017	0.069	0.0016	< 0.00040	0.0027	0.23	0.34	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2017	0.064	0.0015	< 0.00040	0.0024	0.13	0.34	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
MLS 02-9-8	19-Aug-2008	0.0037	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	0.0018	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2010	0.0022	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	0.0027	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	0.00058	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.14	---	---	---	---	---	---	---	---	---
MLS 08-1-4	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 08-2-5	19-Aug-2008	0.0037	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.7	---	---	---	---	---	---	---	---	---
	19-Aug-2009	0.0058	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	19-Aug-2010	0.0045	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	19-Aug-2011	0.0030	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2012	0.0034	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.15	---	---	---	---	---	---	---	---	---
MLS 08-3-4	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 09-1-3	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.7	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	21-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 09-2-3	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	21-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 09-3-3	19-Aug-2009	0.07	**0.0081 [#1]**	0.0005	0.0041	0.15	0.5	---	---	---	---	---	---	---	---	---
	19-Aug-2010	0.027	**0.011 [#1]**	0.0019	0.02	< 0.1	0.5	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2010	0.031	**0.012 [#1]**	0.0023	0.021	< 0.1	0.4	---	---	---	---	---	---	---	---	---
	19-Aug-2011	0.092	**0.0077 [#1]**	0.0094	0.019	0.23	0.4	---	---	---	---	---	---	---	---	---
	17-Aug-2012	0.0038	< 0.00040	0.00075	0.00087	< 0.1	0.80	---	---	---	---	---	---	---	---	---
	21-Aug-2013	0.089	**0.0022 [#1]**	0.0089	0.0062	0.1	0.28	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
MLS 09-4-4	19-Aug-2009	**0.51 [#1]**	**0.51 [#1]**	0.06	0.26	< 0.1	2.5	---	---	---	---	---	---	---	---	---
	17-Aug-2012	0.1	**0.042 [#1]**	0.02	0.065	< 0.1	6.9	---	---	---	---	---	---	---	---	---
	22-Aug-2013	0.0015	< 0.00040	0.00041	< 0.00080	< 0.1	0.61	---	---	---	---	---	---	---	---	---
	29-Jul-2014	0.026	0.00087	0.0087	0.0012	< 0.1	1.4	---	---	---	---	---	---	---	---	---
MLS 09-5-3	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.3	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 09-6-2	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---
MLS 09-7-2	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	21-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	30-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 09-8-2	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
MLS 09-9-2	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 09-15-3	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	22-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS 92-1-3	20-Oct-1998	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	22-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	25-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	---	---	---	---	---	---	---	---	---	---
MLS 93-10-6	06-Sep-1997	< 0.0005	0.0016	< 0.0005	0.0053	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-1999	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
MLS 93-13-7	22-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	22-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	0.0025	< 0.0004	< 0.0004	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
MLS 93-3-6	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
MLS 93-5-4	28-Aug-2001	< 0.0005	0.0006	< 0.0005	0.0030	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Aug-2001	0.0006	0.0007	< 0.0005	0.0043	---	---	---	---	---	---	---	---	---	---	---
MLS 93-6-6	18-Sep-1999	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
MLS 93-7-4	19-Sep-2000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
MLS 93-8-7	06-Sep-1997	0.012	**0.0027 [#1]**	< 0.0005	0.005	---	---	---	---	---	---	---	---	---	---	---
	07-Sep-1998	0.0059	0.0009	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-1999	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2000	0.0013	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
MLS 93-9-6	06-Sep-1997	< 0.0005	0.0018	< 0.0005	0.0056	---	---	---	---	---	---	---	---	---	---	---
	07-Sep-1998	0.0058	0.0015	< 0.0005	(0.0010-0.0015)	---	---	---	---	---	---	---	---	---	---	---
	18-Sep-1999	0.0021	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	18-Sep-1999	0.0020	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	19-Sep-2000	0.0047	< 0.0005	< 0.0005	0.0006	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2001	0.0018	< 0.0005	< 0.0005	(0.00090-0.0014)	---	---	---	---	---	---	---	---	---	---	---
MLS 97-12-4	27-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	22-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
MLS 98-11-2	28-Aug-2001	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	---	---	---	---	---	---	---	---	---	---
	26-Aug-2003	< 0.0005	< 0.0005	< 0.0005	< 0.001	---	---	---	---	---	---	---	---	---	---	---
	24-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	27-Aug-2005	< 0.0005	< 0.0005	< 0.0005	(0.0020-0.0025)	0.15	< 0.1	---	---	---	---	---	---	---	---	---
MLS SW02	19-Aug-2011	< 0.0004	**0.0046 [#1]**	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	21-Aug-2013	< 0.00040	0.00051	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	30-Jul-2014	< 0.00040	0.00047	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Jun-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
MLS SW03	20-Aug-2009	< 0.0004	0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	0.0006	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Jun-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
MLS SW05	19-Aug-2011	< 0.0004	0.0011	< 0.0004	0.0018	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	22-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Jun-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
MLS-10-1-7	28-Sep-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.7	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Sep-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.4	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	0.2	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.19	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.18	---	---	---	---	---	---	---	---	---
	22-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.32	---	---	---	---	---	---	---	---	---
(Duplicate)	22-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	0.12	0.25	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.18	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.19	---	---	---	---	---	---	---	---	---
MLS-10-2-3	29-Sep-2010	0.0045	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	17-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	23-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS-13-1-3	18-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	06-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS-13-2-3	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-13-3-3	18-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	05-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-13-4-3	18-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	05-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
MLS-13-9-3	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-2-3	30-Jul-2014	< 0.00040	0.00061	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	0.00047	< 0.00040	< 0.00080	< 0.1	0.26	---	---	---	---	---	---	---	---	---
	03-Aug-2016	< 0.00040	0.00087	< 0.00040	< 0.00080	< 0.1	0.29	---	---	---	---	---	---	---	---	---
	16-Aug-2017	< 0.00040	**0.024 [#1]**	< 0.00040	< 0.00080	< 0.10	0.19	---	---	---	---	---	---	---	---	---
MLS-14-3-3	30-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-3-SW	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-4-3	30-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-4-SW	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-5-4	30-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-8-3	29-Jul-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.15	---	---	---	---	---	---	---	---	---
MLS-14-8-SW	21-Aug-2017	< 0.00040	0.00070	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-9-3	04-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
MLS-14-9-SW	16-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Appendix 9 Conceptual Site Model: Bear Island BT1



Imperial

Conceptual Site Model

Bear Island BT1 (APEC BI-3), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0001

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0001 - Conceptual Site Model: Bear Island BT1 (APEC BI-3), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	A. Haigh	M. Brown	S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 1

Figures

Figure 1 Site Location Map

Figure 2 Historical Air Photo 1979

Figure 3 Site Plan Showing Topography

Figure 4 Site Plan Showing Soil Sampling Locations

Figure 5A Site Plan 3-D Visualization

Figure 5B Cross Section A-A' (North to South)

Figure 5C Cross Section A-A' Soil Exceedances, Organic Parameters

Figure 6A Soil Analytical Results: Inorganic Parameters

Figure 6B Soil Analytical Results: Inorganic Parameters (Former BIBT1 Excavation)

Figure 6C Soil Analytical Results: Organic Parameters

Figure 6D Soil Analytical Results: Organic Parameters (Former BIBT1 Excavation)

Figure 7A Groundwater Analytical Results: Inorganic Parameters

Figure 7B Groundwater Analytical Results: Organic Parameters

Figure 8 Conceptual Site Model

Figure 9 Conceptual Exposure Model, Current Land Use and Site Conditions

Tables

Table 1 Soil Analytical Results: Inorganic Parameters

Table 2 Soil Analytical Results: Organic Parameters

Table 3 Water Analytical Results: Inorganic Parameters

Table 4 Water Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE	
Site Description:	Access road through site, with cathodic bed north of the road Above-ground pipeline (utilidor) bounding southern portion of the site (Figure 1).
Current Land Use:	CCME Industrial land use
Future Land Use:	CCME Parkland land use
HISTORICAL LAND USE	
Infrastructure type:	Tank Farm (Figure 2)
Notes:	Crude Oil Storage
Years Active:	From air photos, interpreted to be pre-1971 to approximately 1981 (Figure 2).
SITE SETTING	
Topography and Drainage:	Site slopes to the North/Northwest. Drainage is toward the Mackenzie River flood plain. See Figures 3 and 5A.
Nearby Surface Water Bodies (Distance and Direction):	Mackenzie River (250 m to the North) Bear Island Sump #2 (75 m to the South)
SOIL AND GROUNDWATER CONDITIONS	
Surficial Materials:	Silt, silty clay, silty sand (Figures 5B, 5C)
Depth to Permafrost:	~ 2 to 4 mbgs
Depth to Bedrock:	not encountered to a depth of 7.0 mbgs investigated.
Bedrock Lithology:	not encountered
Number of Groundwater-Bearing Zones:	1
Number of Piezometers:	13 current, 5 historical now destroyed/decommissioned.
Free Product in Upper GW-Bearing Zone:	not encountered
Free Product in Second GW-Bearing Zone:	NA
First Groundwater-Bearing Zone	
Primary Soil Type/Lithology:	Unconsolidated silty sand and silty clay
Dominant Grain Size:	Coarse (assumed porosity n=0.2)
Depth to Groundwater Surface:	~ 1 to 3.5 mbgs
Hydraulic Conductivity (Minimum):	3.7×10^{-7} m /s
Hydraulic Conductivity (Maximum):	1.6×10^{-6} m/s
Hydraulic Conductivity (Geometric Mean K):	7.7×10^{-7} m/s
Vertical Hydraulic Gradient:	Not assessed (underlain by discontinuous permafrost; wells have only been installed in uppermost water-bearing zone).
Lateral Hydraulic Gradient (I):	Typically, I = 0.024, (estimated from fluid level in near-source well BIBT1-10-1-3 of 47.197 m, to unvegetated beach line 240 m away at elevation 41.5 m contour, see top left Figure 3). When river is at mean high water elevation of 42.0 m, this lateral gradient increases to 0.087 (5.2 m over 60 m distance).

Groundwater Flow Direction and Velocity:	Northwest towards Mackenzie River; velocity of a non-reactive tracer estimated at 2.9 m/year (based on v = KI/n) and dissolved PHC velocity 1.3 m/year or less. This estimate is based on the "typical" lateral gradient listed above. The higher gradient noted during river flood stage would only be applicable about 1-2 months per year.

HISTORICAL ENVIRONMENTAL ACTIVITIES

Soil and groundwater characterization (2008 to present; Figure 4)

Remedial excavation - partially complete (2014-2015) with physical limitations due to utilidor south of excavation, active road bed north of excavation, and groundwater seepage in base of excavation. Estimated 4,079 m^3 of impacted soil removed. Backfilled with sand sourced from Island 6 sand bar. Refer to Figures 6A and 6B for excavation outline. The excavated soil is stored on BIT5 (Figure 1).

CURRENT STATUS

Remaining soil and groundwater impacts (Figures 6A-D and 7A-B)

Sources and Impacts

SOURCES	
Historical Sources:	Tank Farm - Leaks/Spills (APEC # BI-3; Appendix 4).
Current Sources:	Impacted soil (secondary source).
KNOWN ENVIRONMENTAL CONCERNS	
a. Soil	
Potential Contaminants of Concern:	Petroleum hydrocarbons (PHCs), salinity, metals, PAHs.
Proven Contaminants of Concern:	PHCs - BTEX, PHC F1 to F4G. Limited Salinity - at or close to background. Polycyclic Aromatic Hydrocarbons (PAHs).
Lateral Delineation:	PHC issues sufficiently delineated laterally for remedial strategy and risk planning purposes (Figure 6D). Potential gaps to the northwest and southwest not fully delineated. Physical barriers (utilidor, wet ground) and separate APEC (sump #2) limit delineation to south.
Vertical Delineation:	Vertical delineation of PHC issues has been limited by saturated ground in remedial excavation and limited soil sampling options available locally for saturated sands.
b. Groundwater	
Potential Contaminants of Concern:	Petroleum hydrocarbons, metals, phenols, PAHs.
Proven Contaminants of Concern:	PHCs - BTEX, PHC F1 to F2 Metals - at or close to background concentrations. Phenols
Presence of Free Product:	No free phase identified during recent events.

Lateral Delineation:	Delineation is achieved for PHCs in a downgradient direction to the north and northwest (Figure 7B). Lateral delineation for metals or phenols is incomplete, but relates in part to elevated background concentrations particularly for certain metals. Elevated phenols values in groundwater close to the source decrease downgradient and drop below the applied FAL guideline approximately 50 m north of the former tank farm (Figures 7A/B).
Vertical Delineation:	Only the upper groundwater-bearing zone to approximately 4-5 mbgs is currently instrumented. Permafrost has been noted in a few local boreholes between 2 and 4 mbgs and may provide a hydraulic barrier at depth.

Migration Pathways and Receptors

MIGRATION PATHWAYS

Summarized in Figures 8 and 9.
Potential pathways include leaching from soil to groundwater, lateral migration in groundwater, discharge to surface water, shallow vapour migration in soil, water and wind erosion.

RECEPTORS

Summarized in Figures 8 and 9.
Main receptor of interest is the Mackenzie River, in relation to human, wildlife and freshwater aquatic life receptors. Plants and soil invertebrates may also be receptors in the rooting zone of shallow soils.

EXPOSURE PATHWAYS

Summarized in Figures 8 and 9

Synopsis of Conceptual Risk

In terms of soil related exposure pathways, the remedial excavations completed to date have removed most PHC impacted soils underlying the former tank farm footprint to a depth of approximately 2.5 m (Figure 6D). Due to physical obstacles to further excavation including the utilidor, the road bed and the high water table, some residual soil impacts exceeding PHC guidelines remain in place. Risks related to potential exposure pathways for human, ecological, microbial and wildlife contact or ingestion have been reduced by the excavations, but not eliminated. The pathway for leaching from soil to groundwater is active, but measured PHC values in groundwater north of the road do not exceed applied parkland guidelines.

In terms of groundwater related exposure pathways, Figure 7B indicates that PHCs exceeding the applied guideline persist under the footprint of the former tank farm, however the PHCs in groundwater have not reached the closest surface water body (Mackenzie River) and associated receptors. The exposure scenario related to groundwater use for drinking water or wildlife watering is considered inactive. The PHC plume is delineated in groundwater approximately 220 m from the typical river shore (excluding the high water mark in flood stage). Typical river shore is assumed to be at approximately the 41.5 m elevation contour, as illustrated in Figures 1 and 5A. Figure 2 is more indicative of near-flood stage conditions, with the river shore in this case being about 40 to 50 m north of the PHC plume as delineated in groundwater.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion.

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 400 m

1:8000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	11-MAY-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No: 1

REV: E

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 12:44:14 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 12:14:31 PM ISSUING OFFICE: eCAD



m 0 50 100 150 m

1:2500

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1979

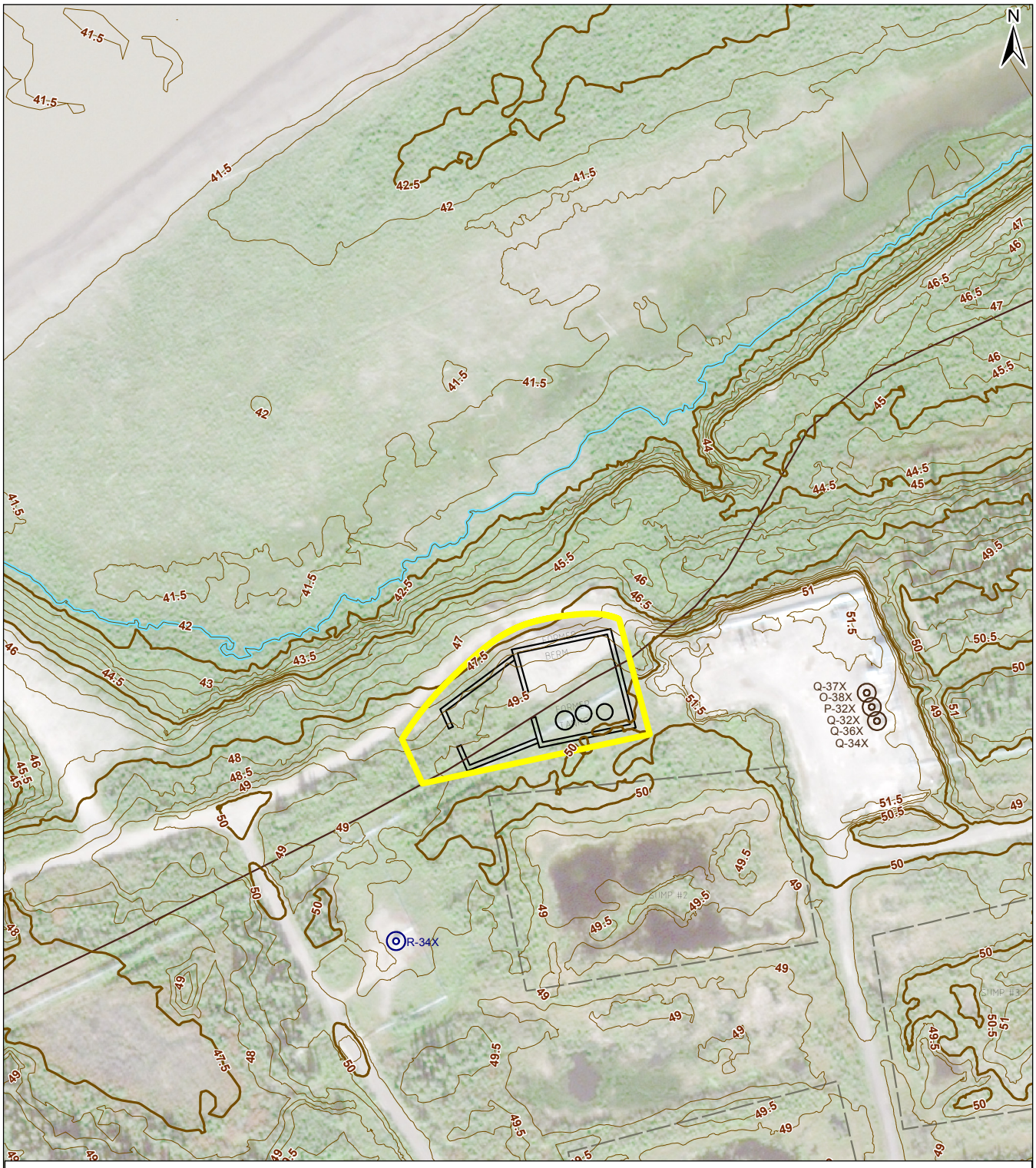
Date: 11-MAY-18	Drawn by: BMF	Edited by: -	App'd by: MB	
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-400		
		FIG No 2	REV B	

OneWay to zero harm

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 11/5/2018 3:40:44 PM
SAVE DATE & TIME: 7/5/2018 11:16:40 AM
USER NAME: blan.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-AIRPHOTO1979.DWG



Mean High Water Elevation of the Mackenzie River
(Generally Corresponding to Lease Boundary/O.W.H.M as per UMA Engineering Ltd. Files 010166101 [Rev 0 dated 95-10-16] and 98100003 [Rev 1 dated 98-10-08])

Site Boundary

Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 50 100
Metres
1:2,500

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	30-MAY-18	Drawn by:	T.G.	Edited by:	T.G.	App'd by:	D.G.

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

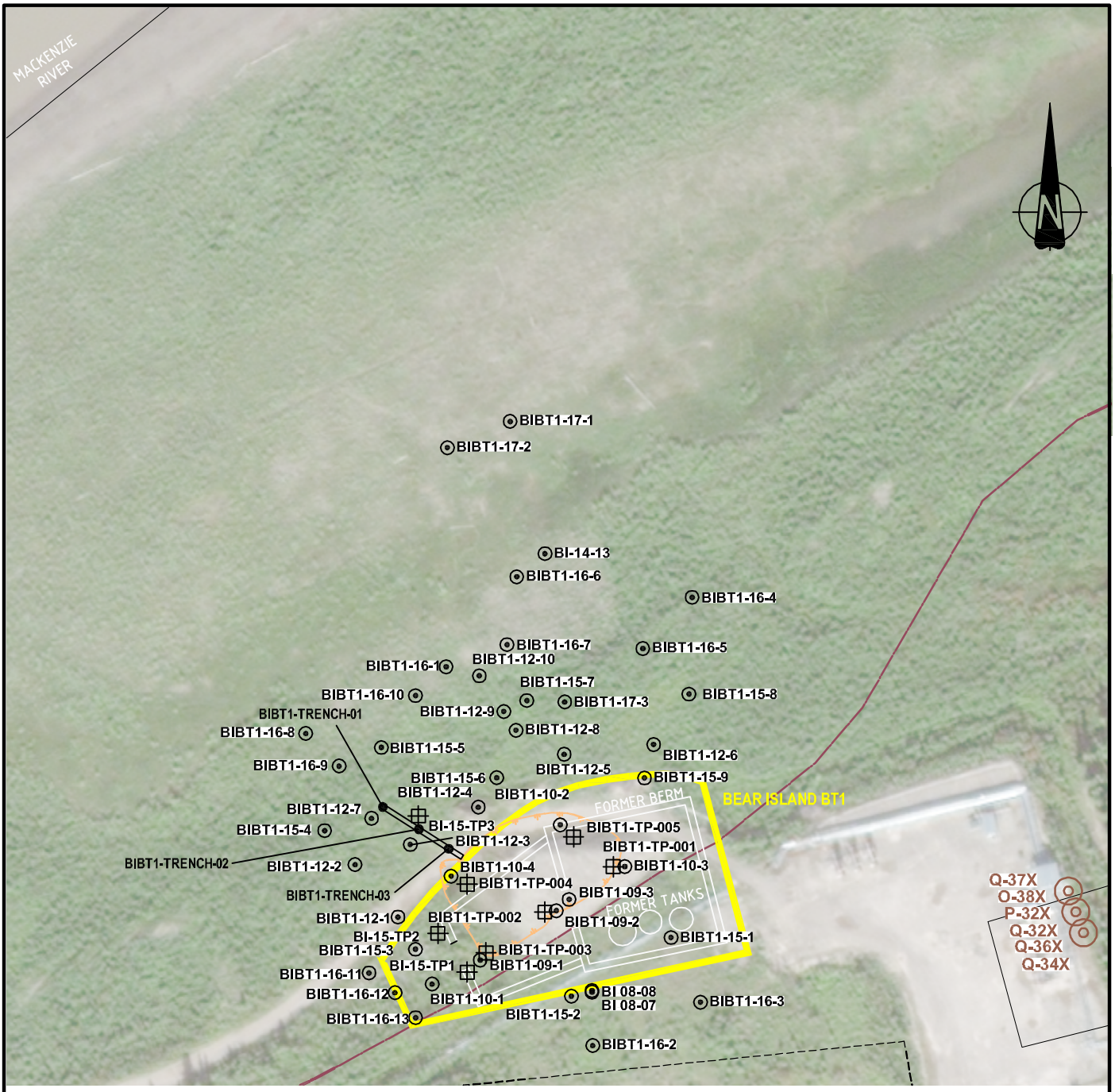
FIG No 3

REV 0

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:36:22 PM
USER NAME: Tom.Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\BIBT1\BearIslandBattery1_Topography_Rev0.mxd



LEGEND

- PRODUCTION WELL LOCATION
- PIPELINE
- SOIL SAMPLING LOCATION
- TEST PIT LOCATION
- 2015 TRENCH
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

SOURCES:

1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 25 50 75 m

1:1750

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SITE PLAN SHOWING SOIL SAMPLING LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
11-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

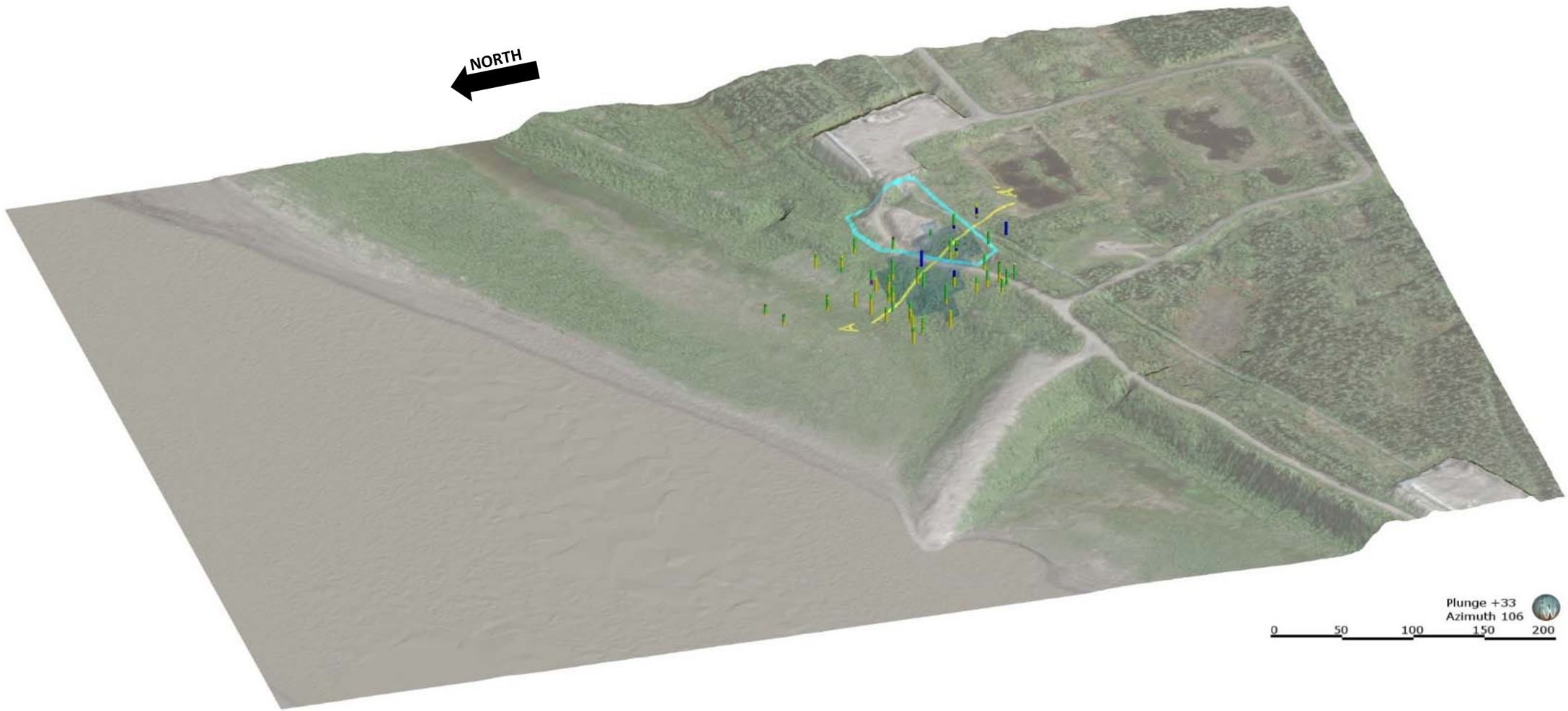
FIG No 4

REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 11/5/2018 3:09:50 PM
SAVE DATE & TIME: 11/5/2018 9:23:32 AM
USER NAME: blan.tink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



Unit
- CLAY
- FILL/ORGANICS
- NO RECOVERY
- PERMAFROST
- SAND
- SILT

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	AM	LG	MB

OneWay to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

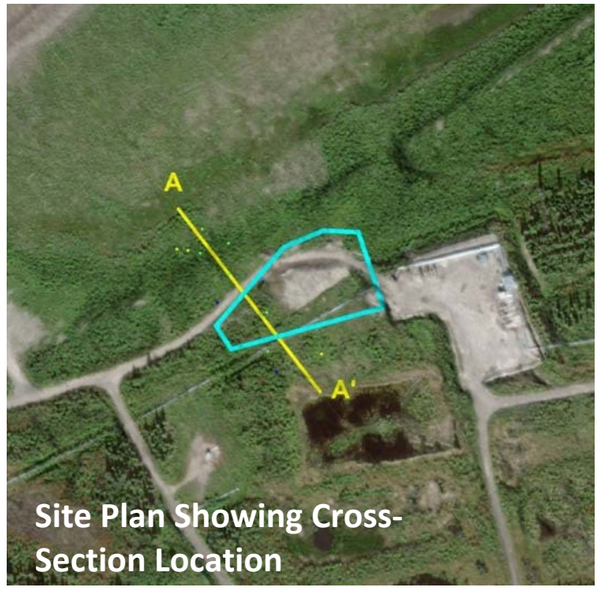
FIG No. 5A

REV B

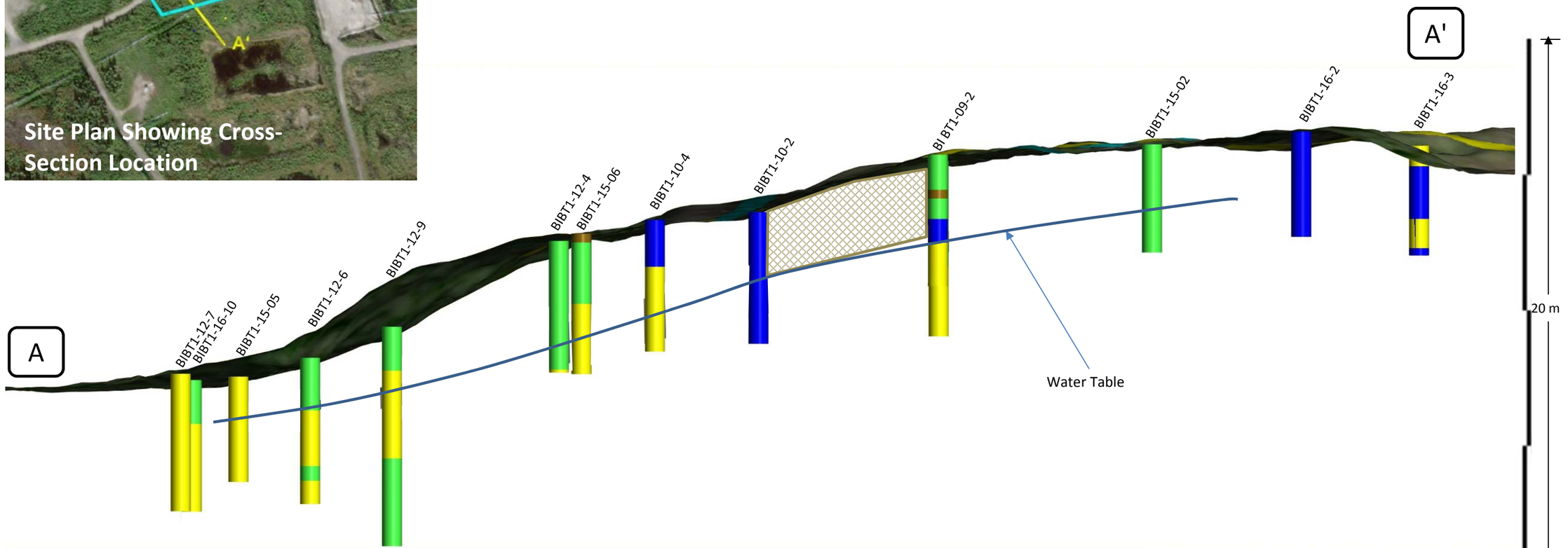
" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CALIGBS\

FILE DIRECTORY: CALGARY



Site Plan Showing Cross-Section Location



Unit

- CLAY
- FILL/ORGANICS
- NO RECOVERY
- PERMAFROST
- SAND
- SILT
- APPROXIMATE EXTENT OF EXCAVATED SOURCE MATERIAL

Notes: 1) 3x Vertical Exaggeration.
2) Cross-Section width is 40 m.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

CROSS-SECTION A-A' (NORTH TO SOUTH)

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	AM	LG	MB

WorleyParsons Project No.: 407011-00622-400

FIG No.: 5B

REV: B

OneWay to zero harm

Advision
WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CALIGBS\

FILE DIRECTORY: CALGARY



Unit

- CLAY
- FILL/ORGANICS
- NO RECOVERY
- PERMAFROST
- SAND
- SILT
- APPROXIMATE EXTENT OF EXCAVATED SOURCE MATERIAL

- LOCATION WHERE ORGANIC PARAMETERS MET GUIDELINES, SHOWN IN GREEN
- LOCATION WHERE ORGANIC PARAMETERS EXCEEDED GUIDELINES, SHOWN IN RED

Notes: 1) 3x Vertical Exaggeration.
2) Cross-Section width is 40 m.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

CROSS-SECTION A-A' SOIL EXCEEDANCES
ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
15-May-18	AM	LG	MB

WorleyParsons Project No.
407011-00622-400

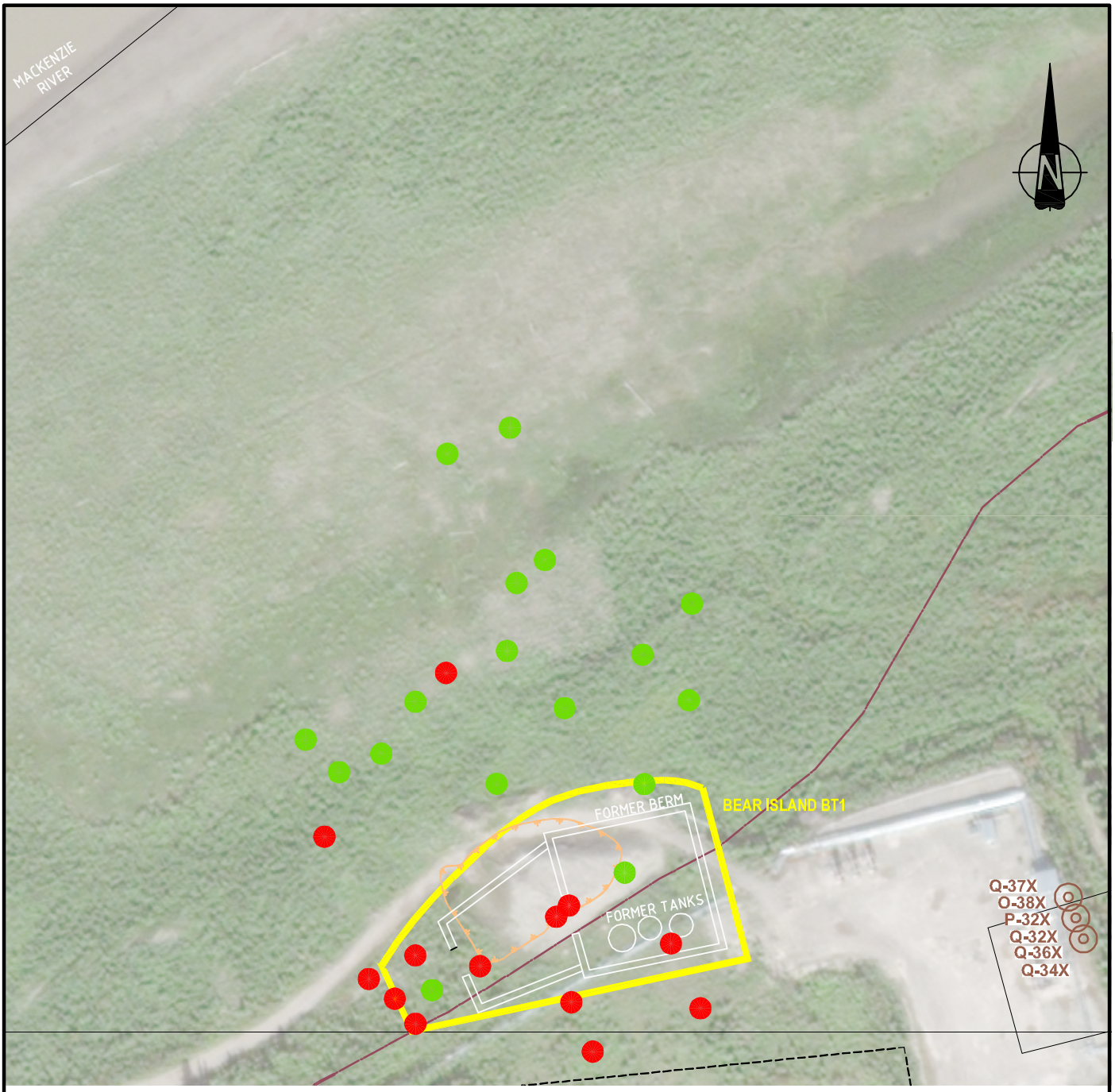
FIG No. 5C
REV B

OneWay to zero harm
Advisian
WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS

FILE DIRECTORY: CALGARY



SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 25 50 75 m

1:1750

LEGEND

PRODUCTION WELL LOCATION

PIPELINE

APPROXIMATE PERIMETER OF FORMER EXCAVATION

ANALYTICAL RESULTS

LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.

LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS: INORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
23-APR-18	OTHERS	BMF	

Advisian
WorleyParsons Group

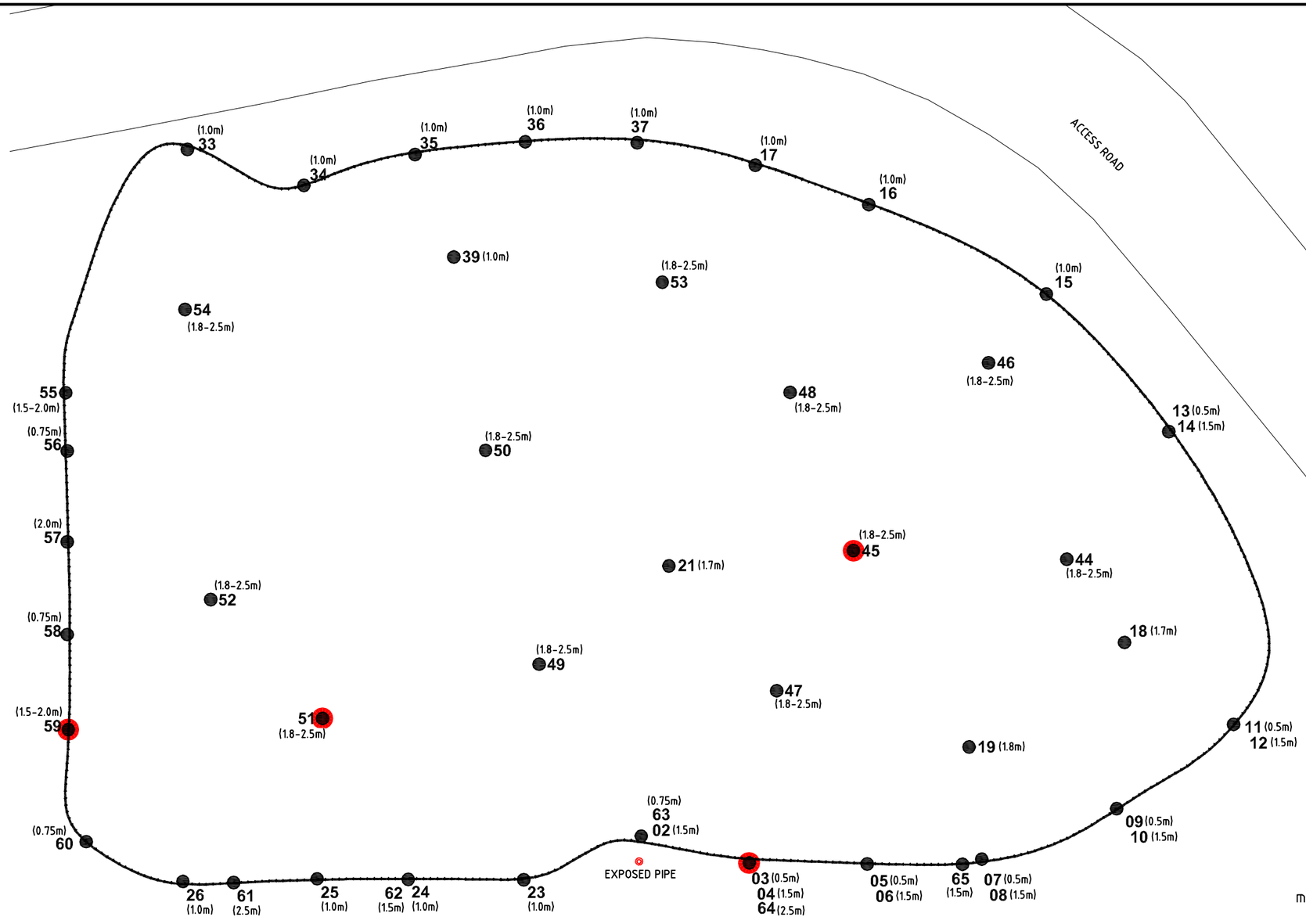
WorleyParsons Project No.
407011-00622-400

FIG No: 6A
REV: A

This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.

PLOT DATE & TIME: 11/5/2018 3:17:11 PM
SAVE DATE & TIME: 11/5/2018 9:23:32 AM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



APPROX. SCALE: 1:200

LEGEND

- PERIMETER OF EXCAVATION
- (1.0m) DEPTH OF SAMPLE
- 01 SAMPLE LOCATION (APPROXIMATE)
- PIPELINE RIGHT-OF-WAY

NOTE: ALL SAMPLE LOCATIONS CONTAIN PREFIX "BIBT1-15-"

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS:
INORGANIC PARAMETERS (FORMER BIBT1 EXCAVATION)

Date:	30-APR-18	Drawn by:	B.M.F.	Edited by:	B.M.F.	App'd by:	MB

Advision
WorleyParsons Group

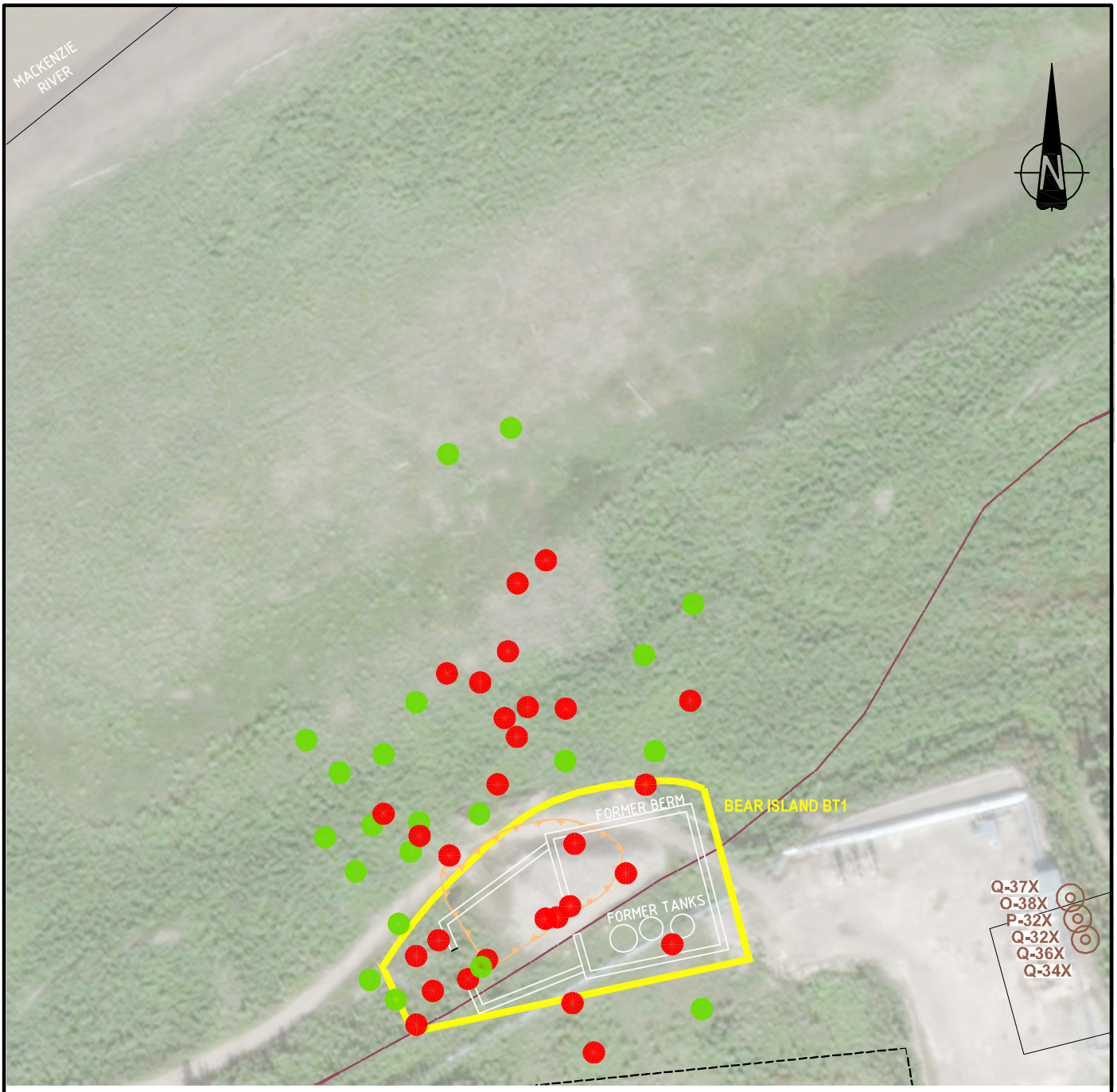
WorleyParsons Project No. 407011-00622-400

FIG No 6B | REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 11/5/2018 2:02:59 PM
SAVE DATE & TIME: 30/4/2018 1:24:51 PM
USER NAME: bblair
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BIBT1EXCAVATION.DWG



SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 25 50 75 m

1:1750

LEGEND

PRODUCTION WELL LOCATION

PIPELINE

APPROXIMATE PERIMETER OF FORMER EXCAVATION

ANALYTICAL RESULTS

LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.

LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS: ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
30-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No: 6C

REV: B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 11/5/2018 3:18:13 PM
SAVE DATE & TIME: 11/5/2018 9:23:32 AM
USER NAME: blan.fink
ISSUING OFFICE: eCAD

ACCESS ROAD

(1.0m) 33 — (1.0m) 34 — (1.0m) 35 — (1.0m) 36 — (1.0m) 37 — (1.0m) 17 — (1.0m) 16 — (1.0m) 15 — 13 (0.5m) 14 (1.5m) — 11 (0.5m) 12 (1.5m) — 09 (0.5m) 10 (1.5m) — 07 (0.5m) 08 (1.5m) — 65 (1.5m) — 05 (0.5m) 06 (1.5m) — 03 (0.5m) 04 (1.5m) 64 (2.5m) — (0.75m) 63 02 (1.5m) — 23 (1.0m) — 62 (1.5m) 24 (1.0m) — 25 (1.0m) — 61 (2.5m) 26 (1.0m) — (0.75m) 60 — (1.5–2.0m) 59 — (0.75m) 58 — (2.0m) 57 — (0.75m) 56 — (1.5–2.0m) 55

39 (1.0m)
54 (1.8–2.5m)
(1.8–2.5m) 53
46 (1.8–2.5m)
48 (1.8–2.5m)
(1.8–2.5m) 50
(1.8–2.5m) 52
21 (1.7m)
(1.8–2.5m) 45
44 (1.8–2.5m)
18 (1.7m)
(1.8–2.5m) 49
47 (1.8–2.5m)
51 (1.8–2.5m)
19 (1.8m)

EXPOSED PIPE

m 0 5 10 m

APPROX. SCALE: 1:200

LEGEND

- PERIMETER OF EXCAVATION
- (1.0m) DEPTH OF SAMPLE
- 01 SAMPLE LOCATION (APPROXIMATE)
- PIPELINE RIGHT-OF-WAY

NOTE: ALL SAMPLE LOCATIONS CONTAIN PREFIX "BIBT1-15-"

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT
- 1234 EXCEEDANCES OF CRITERIA, SHOWN IN RED AND BOLD

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS:
ORGANIC PARAMETERS (FORMER BIBT1 EXCAVATION)

Date:	11-MAY-18	Drawn by:	B.M.F.	Edited by:	B.M.F.	App'd by:	MS

Advisian
WorleyParsons Group

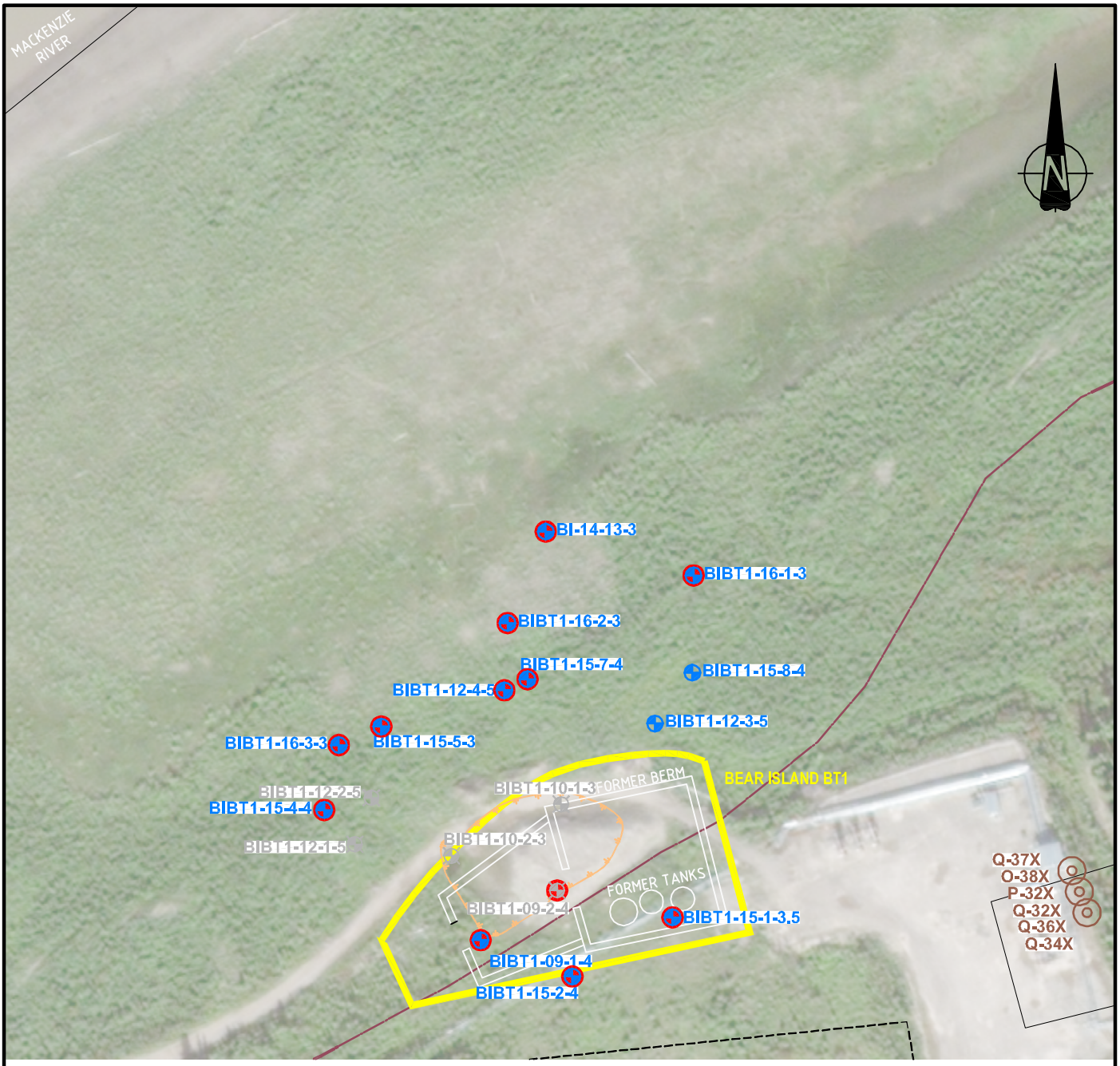
WorleyParsons Project No. 407011-00622-400

FIG No 6D | REV C

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 11/5/2018 2:24:08 PM
SAVE DATE & TIME: 30/4/2018 1:24:51 PM
USER NAME: bfairfax
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BIBT1EXCAVATION.DWG



LEGEND

- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 25 50 75 m

1:1750

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

GROUNDWATER ANALYTICAL RESULTS: INORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
30-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

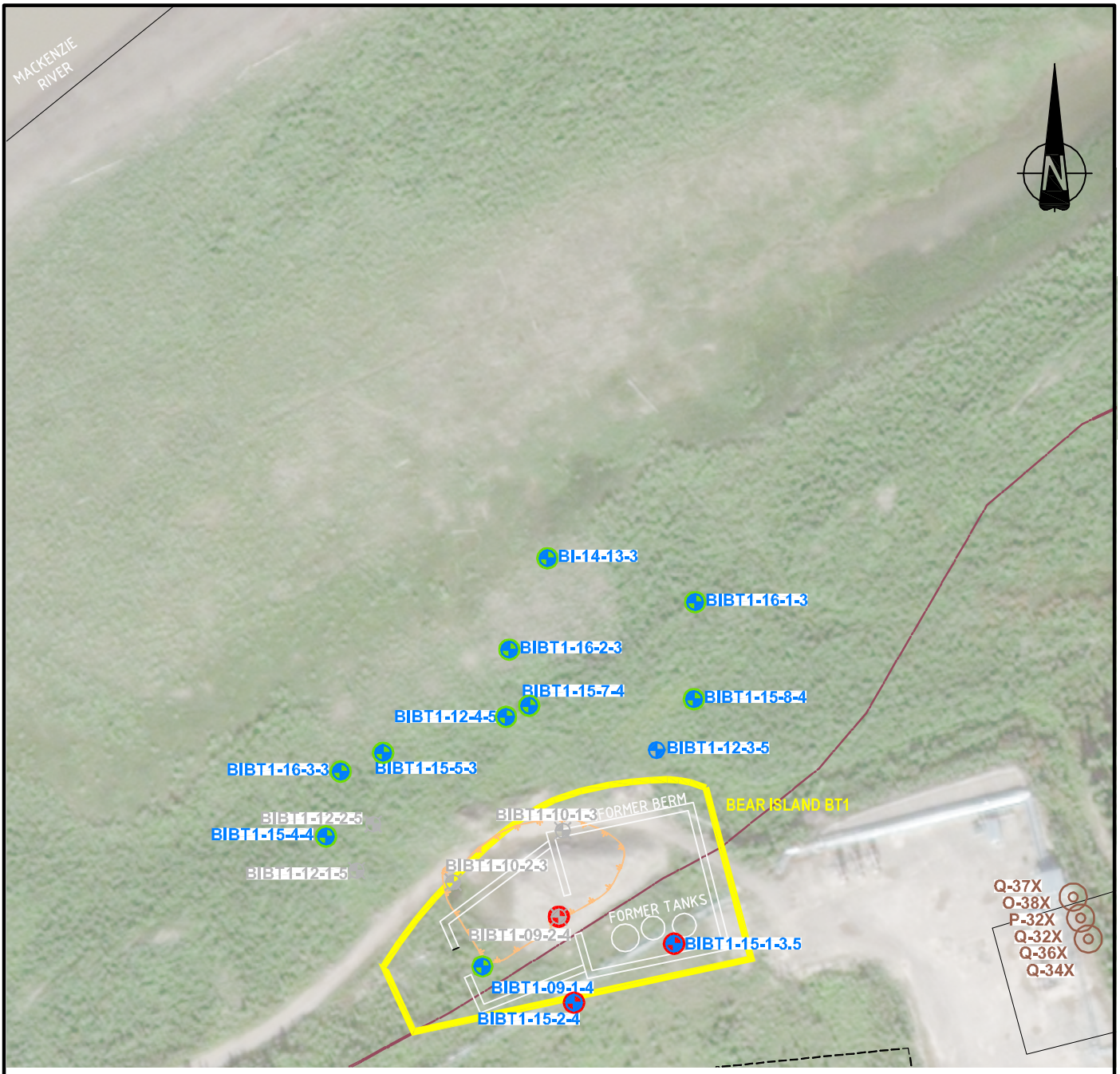
FIG No 7A

REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blan.tink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 11/5/2018 3:20:14 PM
SAVE DATE & TIME: 11/5/2018 9:23:32 AM

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 25 50 75 m

1:1750

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

GROUNDWATER ANALYTICAL RESULTS: ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
30-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

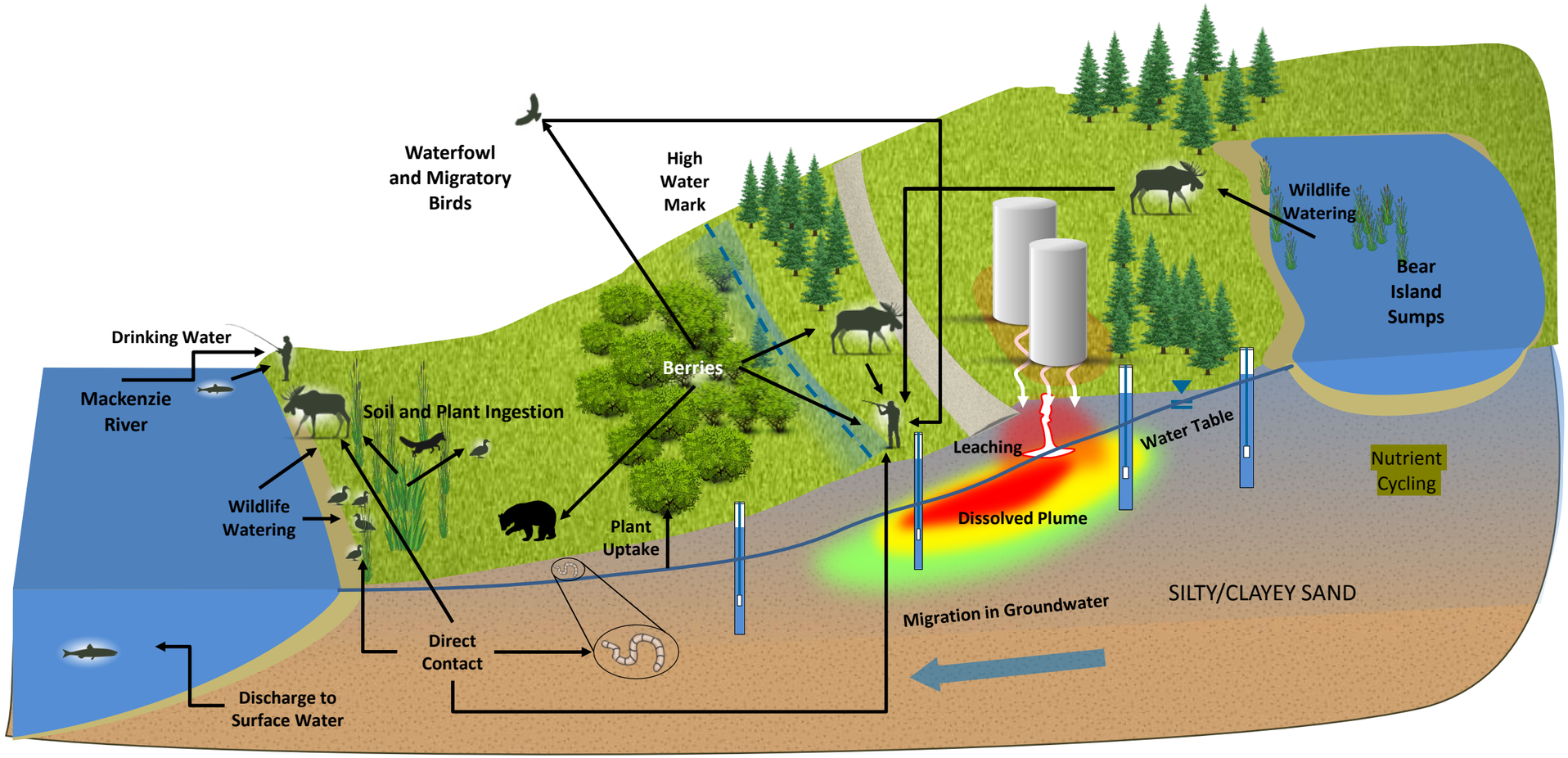
FIG No 7B

REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 11/5/2018 3:21:22 PM
SAVE DATE & TIME: 11/5/2018 9:23:32 AM
USER NAME: blan.tink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



Health Canada, 2015. Conceptual Site Model Builder, Version 1.0. Developed by eSolutions Group Ltd. 2015.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL

Date:	Drawn by:	Edited by:	App'd by:
28-May-18	AH	LG	MB

OneWay to zero harm

Advisian WorleyParsons Group

WorleyParsons Project No. 407011-00622

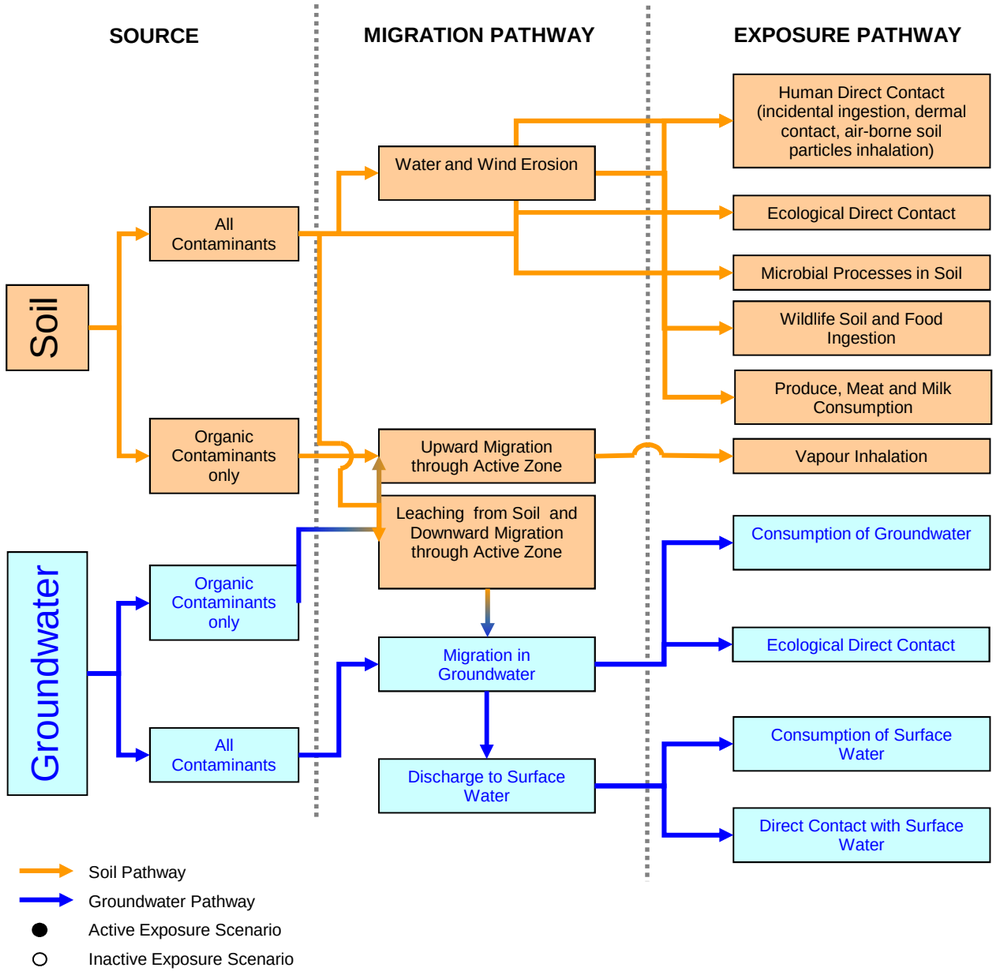
FIG No. 8 | REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS

Bear Island BT1 - Conceptual Exposure Model Flow Chart (Current Land Use and Site Conditions)



RECEPTORS			
Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
●			
		●	
		●	
	●		
●[1]			
○			
		●	
○	●		
			●

Notes: 1) Although the current land use is industrial, it is recognized that due to the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site, and hunters are able to hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND BT1, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

OneWay™ to zero harm

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AH	LG	MB

Advision
WorleyParsons Group

WorleyParsons Project No. 407011-00622

FIG No. 9 REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIBT1

Tables



Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Coarse Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BI-14-13	23-Feb-2014	1.0m	0.58	0.48	6.72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Feb-2014	2.0m	0.67	0.48	6.73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Feb-2014	3.0m	0.36	0.56	6.81	< 1.0	5.7	180	< 0.40	0.32	9.9	< 0.15	5.7	11	5.7	< 0.050	1.4	17	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	19	59
	23-Feb-2014	4.0m	0.36	0.41	6.50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI BT1-09-1	14-Aug-2009	0.0 - 0.3m	**3.4** [#1]	0.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	1.0 - 1.3m	**2.4** [#1]	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	3.3 - 3.6m	**3** [#2]	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI BT1-09-2	14-Aug-2009	0.0 - 0.3m	**5.5** [#1]	3.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	1.6 - 1.9m	**4.1** [#1]	1.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	3.0 - 3.3m	**2.5** [#2]	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI BT1-09-3	14-Aug-2009	0.0 - 0.3m	**3.2** [#1]	4.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	2.4 - 2.7m	**2.3** [#1]	1.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-1	27-Aug-2010	5.7 - 6.0m	1.4	0.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-3	27-Aug-2010	5.7 - 6.0m	1.3	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-4/10-2-3	27-Aug-2010	0.0 - 0.5m	1.8	0.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-1-3.5	29-Sep-2015	1.8m	0.61	0.64	6.69	0.57	8.7	340	0.49	0.54	15	< 0.080	9.3	20	11	< 0.050	2.3	28	0.66	< 0.20	0.14	< 1.0	0.97	26	88
	29-Sep-2015	2.4m	0.58	0.57	6.74	0.50	8.7	290	0.51	0.58	16	< 0.080	9.2	20	11	< 0.050	2.1	28	0.70	< 0.20	0.14	< 1.0	0.99	25	92
	29-Sep-2015	3.6m	**2.7** [#2]	0.30	6.87	0.53	7.8	280	0.43	0.51	15	< 0.080	7.8	18	8.5	< 0.050	2.0	23	0.61	< 0.20	0.13	< 1.0	0.89	23	79
	29-Sep-2015	4.2m	**3.0** [#2]	0.55	7.49	< 0.50	5.2	120	< 0.40	0.28	8.5	< 0.080	6.2	8.2	5.0	< 0.050	1.4	16	< 0.50	< 0.20	< 0.10	< 1.0	0.67	16	48
BIBT1-15-2-4	29-Sep-2015	1.2m	0.48	0.97	6.84	0.56	8.5	340	0.47	0.51	15	< 0.080	8.6	18	13	< 0.050	2.1	26	0.61	< 0.20	0.16	< 1.0	0.87	26	81
	29-Sep-2015	2.4m	0.38	0.88	6.81	0.58	8.7	320	0.49	0.59	16	< 0.080	8.7	19	9.7	< 0.050	2.1	26	0.73	< 0.20	0.15	< 1.0	0.87	26	88
	29-Sep-2015	3.6m	**2.8** [#2]	0.42	6.89	0.59	8.2	240	0.42	0.53	15	< 0.080	8.1	17	8.8	< 0.050	2.0	25	0.64	< 0.20	0.13	< 1.0	0.95	23	82
BIBT1-15-03	01-Oct-2015	1.2m	**2.5** [#1]	0.54	6.67	0.58	9.2	340	0.51	0.48	18	< 0.080	9.9	20	10	< 0.050	2.0	29	0.71	< 0.20	0.17	< 1.0	0.90	30	88
	01-Oct-2015	3.0m	**3.2** [#1]	1.4	6.98	0.58	7.9	250	< 0.40	0.55	14	< 0.080	8.1	16	8.0	< 0.050	2.0	24	0.60	< 0.20	0.12	< 1.0	0.97	23	78
	01-Oct-2015	4.8m	**2.9** [#2]	1.8	6.90	0.59	6.4	200	< 0.40	0.49	12	< 0.080	7.6	15	7.3	< 0.050	1.7	21	0.51	< 0.20	0.12	< 1.0	1.2	21	75
BIBT1-15-4	25-Feb-2015	1.5m	**2.2** [#1]	**5.8** [#1]	7.11	< 1.0	7.9	270	< 0.40	0.48	14	< 0.15	7.8	17	8.8	< 0.050	1.9	24	0.62	< 1.0	< 0.30	< 1.0	< 1.0	24	76
BIBT1-15-4-4	01-Oct-2015	2.4m	**2.8** [#1]	0.29	7.44	0.51	6.3	190	< 0.40	0.39	10	< 0.080	6.4	10	5.7	< 0.050	1.4	18	< 0.50	< 0.20	< 0.10	< 1.0	0.72	20	58
	01-Oct-2015	3.6m	**2.2** [#2]	0.74	7.42	< 0.50	4.8	110	< 0.40	0.23	7.5	< 0.080	5.5	6.5	4.5	< 0.050	1.1	14	< 0.50	< 0.20	< 0.10	< 1.0	0.58	14	46
	01-Oct-2015	4.8m	**2.4** [#2]	0.77	7.13	< 0.50	5.6	120	< 0.40	0.35	7.9	< 0.080	6.0	12	5.9	< 0.050	1.3	16	< 0.50	< 0.20	< 0.10	< 1.0	0.71	14	56
BIBT1-15-5-3	01-Oct-2015	1.8m	0.34	0.80	7.31	< 0.50	4.6	100	< 0.40	0.26	6.4	< 0.080	4.9	7.2	4.5	< 0.050	0.99	13	< 0.50	< 0.20	< 0.10	< 1.0	0.68	12	44
	01-Oct-2015	3.6m	0.68	0.46	6.80	0.51	6.2	160	< 0.40	0.44	8.5	< 0.080	6.5	14	6.8	< 0.050	1.5	18	< 0.50	< 0.20	< 0.10	< 1.0	0.90	16	64

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Coarse Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIBT1-15-06	02-Oct-2015	2.4m	1.0	0.43	7.20	< 0.50	6.8	160	< 0.40	0.48	10	< 0.080	6.6	14	7.0	< 0.050	1.6	20	< 0.50	< 0.20	0.10	< 1.0	0.85	17	68
	02-Oct-2015	3.6m	1.3	0.43	7.12	< 0.50	5.8	130	< 0.40	0.44	8.3	< 0.080	6.2	12	5.8	< 0.050	1.4	18	< 0.50	< 0.20	< 0.10	< 1.0	0.72	15	57
	02-Oct-2015	4.8m	0.73	0.83	7.16	< 0.50	5.8	130	< 0.40	0.35	8.3	< 0.080	6.2	11	5.9	< 0.050	1.4	17	< 0.50	< 0.20	< 0.10	< 1.0	0.64	15	57
BIBT1-15-7-4	01-Oct-2015	2.4m	0.41	0.43	7.60	< 0.50	4.4	100	< 0.40	0.26	6.5	< 0.080	4.9	6.3	4.4	< 0.050	1.1	13	< 0.50	< 0.20	< 0.10	< 1.0	0.60	12	43
	01-Oct-2015	3.6m	1.0	0.44	7.16	< 0.50	5.3	120	< 0.40	0.28	8.4	< 0.080	6.1	9.1	5.5	< 0.050	1.3	17	< 0.50	< 0.20	< 0.10	< 1.0	0.75	17	54
BIBT1-15-8-4	02-Oct-2015	2.4m	1.1	0.26	7.07	0.64	8.9	290	0.45	0.52	16	< 0.080	9.7	20	9.4	< 0.050	1.8	28	0.66	< 0.20	0.14	< 1.0	0.91	26	89
	02-Oct-2015	3.6m	1.5	0.23	6.90	0.52	6.9	170	< 0.40	0.47	11	< 0.080	7.3	14	7.2	< 0.050	1.8	21	< 0.50	< 0.20	0.10	< 1.0	0.83	18	73
	02-Oct-2015	4.8m	1.8	0.28	7.06	< 0.50	6.3	140	< 0.40	0.39	11	< 0.080	7.0	12	7.2	< 0.050	1.6	20	< 0.50	< 0.20	< 0.10	< 1.0	0.91	17	64
BIBT1-15-09	02-Oct-2015	1.8m	1.9	0.29	7.09	0.56	8.0	250	0.42	0.56	13	< 0.080	8.4	19	8.9	< 0.050	2.0	25	0.62	< 0.20	0.16	< 1.0	0.83	21	84
	02-Oct-2015	3.6m	1.9	0.39	7.17	0.54	7.5	250	< 0.40	0.58	12	< 0.080	7.6	17	8.1	< 0.050	2.0	23	0.62	< 0.20	0.13	< 1.0	0.92	21	76
BIBT1-15-45	13-Mar-2015	1.8 - 2.5m	**2.6** [#1]	2.5	7.18	0.59	8.6	290	0.44	0.58	16	< 0.15	8.4	19	10	< 0.050	2.1	27	0.73	< 0.20	0.15	< 1.0	0.87	25	88
BIBT1-15-51	13-Mar-2015	1.8 - 2.5m	**3.2** [#1]	0.72	7.96	0.63	8.0	180	< 0.40	0.55	13	< 0.15	8.0	16	8.9	< 0.050	2.1	24	0.65	< 0.20	0.14	< 1.0	1.1	24	80
BIBT1-15-59	13-Mar-2015	1.5 - 2.0m	**3.8** [#1]	0.77	7.40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-NTSP-2	25-Feb-2015	Unknown	**2.0** [#1]	1.1	6.86	< 1.0	8.0	270	0.43	0.49	15	< 0.15	8.0	17	9.2	< 0.050	1.9	25	0.57	< 1.0	< 0.30	< 1.0	< 1.0	22	79
BIBT1-15-TSP-1	25-Feb-2015	Unknown	**3.1** [#1]	1.8	6.92	< 1.0	8.0	280	< 0.40	0.47	14	< 0.15	8.1	18	9.4	< 0.050	2.1	25	0.56	< 1.0	< 0.30	< 1.0	< 1.0	23	80
BIBT1-16-1	28-Feb-2016	0.3 - 0.5m	0.46	0.48	7.37	0.58	8.0	280	0.42	0.52	17	< 0.080	8.8	18	8.9	0.050	2.0	26	0.57	< 0.20	0.13	< 1.0	0.83	24	84
	28-Feb-2016	1.5 - 1.8m	**2.2** [#1]	0.37	6.89	0.66	8.5	300	0.43	0.62	14	< 0.080	8.7	20	9.6	0.053	2.2	26	0.67	< 0.20	0.14	< 1.0	0.96	24	91
	28-Feb-2016	2.5 - 2.8m	1.2	0.35	6.75	0.53	6.3	160	< 0.40	0.43	9.8	< 0.080	6.5	12	6.3	< 0.050	1.6	19	< 0.50	< 0.20	< 0.10	< 1.0	0.92	18	64
BIBT1-16-2	29-Feb-2016	1.2 - 1.4m	0.49	0.43	6.77	0.63	8.9	320	0.48	0.55	16	< 0.080	9.4	20	10	0.051	2.2	28	0.69	< 0.20	0.15	< 1.0	1.0	25	90
	29-Feb-2016	2.0 - 2.3m	1.1	0.36	6.82	0.64	9.1	330	0.47	0.59	16	< 0.080	9.4	21	10	0.052	2.2	28	0.72	< 0.20	0.14	< 1.0	1.0	26	93
	29-Feb-2016	3.2 - 3.4m	**2.6** [#2]	0.31	6.80	0.59	8.8	280	0.46	0.56	16	< 0.080	9.1	19	9.7	0.051	2.2	28	0.64	< 0.20	0.14	< 1.0	0.94	24	92
BIBT1-16-3	29-Feb-2016	0.5 - 0.7m	1.4	0.39	7.05	0.74	11	390	0.63	0.88	18	< 0.080	12	24	12	0.054	2.5	34	0.88	< 0.20	0.18	< 1.0	1.2	31	110
	29-Feb-2016	2.2 - 2.5m	**2.7** [#1]	0.38	6.85	0.62	8.8	290	0.44	0.57	16	< 0.080	9.1	19	9.5	< 0.050	2.2	27	0.68	< 0.20	0.14	< 1.0	0.99	25	90
	29-Feb-2016	3.4 - 3.6m	0.45	0.56	6.92	< 0.50	5.8	170	< 0.40	0.32	12	< 0.080	6.3	10	6.0	< 0.050	1.4	19	< 0.50	< 0.20	< 0.10	< 1.0	0.70	18	56
BIBT1-16-10	28-Sep-2016	1.0 - 1.5m	0.76	0.40	7.31	0.59	8.3	290	0.44	0.55	14	< 0.080	8.6	22	9.3	0.055	2.0	26	0.62	< 0.20	0.13	< 1.0	0.95	24	87
	28-Sep-2016	2.5 - 3.0m	0.50	0.41	6.92	< 0.50	6.2	150	< 0.40	0.37	10	< 0.080	6.7	11	6.5	< 0.050	1.6	19	< 0.50	< 0.20	< 0.10	< 1.0	0.77	18	65
	28-Sep-2016	3.0 - 3.5m	1.3	0.32	7.05	0.51	6.4	130	< 0.40	0.36	9.8	< 0.080	7.4	13	6.6	< 0.050	1.8	20	< 0.50	< 0.20	< 0.10	< 1.0	0.87	19	67
	28-Sep-2016	4.0 - 4.5m	1.3	0.38	6.83	0.71	8.5	260	0.40	0.90	11	< 0.080	8.8	23	8.9	0.057	3.0	26	0.75	< 0.20	0.14	< 1.0	1.3	21	84
BIBT1-16-11	28-Sep-2016	1.0 - 1.5m	**3.1** [#1]	2.0	7.35	0.58	8.5	280	0.44	0.51	14	< 0.080	8.5	19	9.3	< 0.050	2.1	25	0.63	< 0.20	0.13	< 1.0	0.92	23	84
	28-Sep-2016	2.0 - 2.5m	**3.1** [#1]	1.7	7.17	0.53	7.6	220	< 0.40	0.48	12	< 0.080	7.5	16	8.2	< 0.050	1.9	22	0.55	< 0.20	0.12	< 1.0	0.91	21	76
	28-Sep-2016	4.0 - 4.5m	**2.5** [#2]	2.2	7.08	0.51	7.0	180	< 0.40	0.48	11	< 0.080	7.2	14	7.5	< 0.050	1.8	21	< 0.50	< 0.20	0.11	< 1.0	0.91	19	72
BIBT1-16-12	28-Sep-2016	1.0 - 1.5m	**2.3** [#1]	1.1	7.13	0.57	8.5	310	0.51	0.55	15	< 0.080	9.3	20	10	< 0.050	2.3	28	0.66	< 0.20	0.14	< 1.0	0.90	25	88
	28-Sep-2016	2.0 - 2.5m	**3.1** [#1]	1.4	7.16	0.59	8.3	280	0.44	0.59	13	< 0.080	8.7	19	9.4	< 0.050	2.1	25	0.63	< 0.20	0.14	< 1.0	0.88	22	85
	29-Sep-2016	4.0 - 4.5m	**2.5** [#2]	1.2	7.04	0.57	7.3	180	< 0.40	0.62	11	< 0.080	8.0	17	8.0	0.073	2.0	23	0.59	< 0.20	0.12	< 1.0	1.1	20	78

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Coarse Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIBT1-16-13	29-Sep-2016	1.0 - 1.5m	**2.8** [#1]	0.38	7.18	0.59	8.7	310	0.50	0.58	15	< 0.080	8.7	19	10	< 0.050	2.1	27	0.66	< 0.20	0.15	< 1.0	0.88	25	91
	29-Sep-2016	2.5 - 3.0m	**3.1** [#1]	1.1	6.90	0.56	8.0	260	< 0.40	0.55	13	< 0.080	7.7	17	9.0	< 0.050	1.9	24	0.60	< 0.20	0.12	< 1.0	0.97	22	82
	29-Sep-2016	4.0 - 4.5m	**2.6** [#2]	1.0	7.10	0.54	7.8	190	< 0.40	0.57	12	< 0.080	7.9	17	8.3	0.059	2.1	24	0.56	< 0.20	0.12	< 1.0	0.84	21	80
BIBT1-16-4	26-Sep-2016	1.0 - 1.5m	0.86	0.58	7.33	< 0.50	5.6	140	< 0.40	0.31	9.3	< 0.080	6.4	9.2	5.5	< 0.050	1.5	18	< 0.50	< 0.20	< 0.10	< 1.0	0.66	17	55
	26-Sep-2016	2.0 - 2.5m	0.80	0.38	7.03	< 0.50	6.4	160	< 0.40	0.43	11	< 0.080	7.1	15	7.3	< 0.050	1.8	21	< 0.50	< 0.20	< 0.10	< 1.0	0.85	19	70
	26-Sep-2016	3.0 - 3.5m	0.66	0.42	6.85	0.57	8.3	190	< 0.40	0.63	12	< 0.080	8.3	18	8.4	< 0.050	2.9	25	0.59	< 0.20	0.12	< 1.0	0.96	20	73
	26-Sep-2016	4.0 - 4.5m	0.72	0.44	6.95	< 0.50	7.0	160	< 0.40	0.45	10	< 0.080	7.0	14	7.1	< 0.050	1.8	20	< 0.50	< 0.20	0.10	< 1.0	0.91	19	69
BIBT1-16-5	27-Sep-2016	1.0 - 1.5m	0.99	0.31	6.89	< 0.50	6.5	180	< 0.40	0.54	10	< 0.080	7.1	14	7.3	< 0.050	1.6	21	< 0.50	< 0.20	< 0.10	< 1.0	0.86	19	67
	27-Sep-2016	2.0 - 2.5m	0.99	0.35	7.10	< 0.50	6.1	160	< 0.40	0.35	9.9	< 0.080	6.4	11	6.4	< 0.050	1.4	18	< 0.50	< 0.20	< 0.10	< 1.0	0.80	18	59
	27-Sep-2016	3.0 - 3.5m	0.91	0.44	6.88	0.61	7.5	210	< 0.40	0.48	12	< 0.080	7.9	17	8.7	< 0.050	1.8	23	0.55	< 0.20	0.12	< 1.0	0.86	21	77
BIBT1-16-6	27-Sep-2016	1.0 - 1.5m	0.74	0.42	7.35	< 0.50	5.9	150	< 0.40	0.41	9.6	< 0.080	6.7	11	6.5	< 0.050	1.5	19	< 0.50	< 0.20	< 0.10	< 1.0	0.77	17	61
	27-Sep-2016	2.0 - 2.5m	0.68	0.44	6.99	< 0.50	6.4	140	< 0.40	0.37	9.6	< 0.080	6.3	11	6.2	< 0.050	1.4	18	< 0.50	< 0.20	< 0.10	< 1.0	0.71	17	60
	28-Sep-2016	3.0 - 3.5m	0.80	0.41	6.84	0.65	8.0	260	0.43	0.67	14	< 0.080	8.6	20	9.9	< 0.050	**15** [#2]	30	0.67	0.22	0.14	< 1.0	0.97	22	90
	28-Sep-2016	4.0 - 4.5m	0.84	0.41	6.74	0.68	7.4	220	< 0.40	0.80	11	< 0.080	7.4	18	8.6	< 0.050	1.9	23	0.74	< 0.20	0.15	< 1.0	1.0	21	81
BIBT1-16-7	28-Sep-2016	1.0 - 1.5m	0.67	0.35	6.89	< 0.50	6.2	190	< 0.40	0.38	11	< 0.080	6.5	12	6.5	< 0.050	1.5	19	< 0.50	< 0.20	< 0.10	< 1.0	0.67	18	60
	28-Sep-2016	2.0 - 2.5m	0.81	0.43	6.86	0.54	6.5	170	< 0.40	0.50	12	< 0.080	7.6	16	7.8	0.068	1.6	22	< 0.50	< 0.20	0.11	< 1.0	0.91	21	75
	28-Sep-2016	3.0 - 3.5m	0.85	0.42	6.85	0.54	6.4	150	< 0.40	0.41	9.8	< 0.080	7.8	12	6.8	0.057	2.0	21	< 0.50	< 0.20	< 0.10	< 1.0	0.80	19	67
	28-Sep-2016	4.0 - 4.5m	0.94	0.38	6.79	0.58	7.1	170	< 0.40	0.50	11	< 0.080	7.5	13	7.5	0.053	3.4	22	0.52	< 0.20	0.11	< 1.0	0.79	19	71
BIBT1-16-8	28-Sep-2016	1.0 - 1.5m	0.51	0.44	6.82	0.54	7.0	170	< 0.40	0.47	10	< 0.080	7.0	13	7.0	0.055	1.8	20	< 0.50	< 0.20	0.10	< 1.0	0.80	19	68
	28-Sep-2016	2.5 - 3.0m	0.76	0.31	6.80	0.52	6.0	140	< 0.40	0.49	10	< 0.080	6.8	14	7.1	< 0.050	1.5	20	< 0.50	< 0.20	0.10	< 1.0	0.77	18	64
	28-Sep-2016	4.0 - 4.5m	0.76	0.36	6.80	0.73	8.8	300	0.51	0.59	24	< 0.080	9.8	23	11	0.068	3.2	30	0.66	< 0.20	0.14	< 1.0	0.99	26	99
BIBT1-16-9	28-Sep-2016	1.0 - 1.5m	0.49	0.36	7.11	< 0.50	7.0	170	< 0.40	0.48	11	< 0.080	6.6	15	7.2	< 0.050	1.6	20	< 0.50	< 0.20	< 0.10	< 1.0	0.78	18	69
	28-Sep-2016	2.0 - 2.5m	0.57	0.34	7.08	< 0.50	5.2	140	< 0.40	0.34	9.4	< 0.080	6.7	10	5.9	< 0.050	1.4	18	< 0.50	< 0.20	< 0.10	< 1.0	0.84	17	62
	28-Sep-2016	4.0 - 4.5m	0.76	0.36	6.76	0.67	8.6	280	0.47	0.60	15	< 0.080	9.4	24	11	0.066	1.8	29	0.69	< 0.20	0.14	< 1.0	0.95	24	95
BIBT1-17-1	27-Sep-2017	0.0 - 1.0m	0.49	0.61	7.52	0.58	8.1	290	0.43	0.59	15	< 0.080	9.2	20	9.6	---	1.9	27	0.62	< 0.20	0.14	< 1.0	0.87	**24** [#5]	93
	27-Sep-2017	1.5 - 2.0m	0.75	0.44	7.51	0.58	7.6	220	0.41	0.56	13	< 0.080	8.1	17	8.5	---	1.8	24	0.59	< 0.20	0.13	< 1.0	0.87	22	81
BIBT1-17-2	27-Sep-2017	0.5 - 1.0m	0.51	0.63	7.81	0.57	7.8	270	0.42	0.58	14	< 0.080	8.5	18	8.7	---	1.9	25	0.57	< 0.20	0.13	< 1.0	0.91	22	86
	27-Sep-2017	2.0 - 2.5m	0.50	0.79	7.69	< 0.50	5.7	150	< 0.40	0.34	8.8	< 0.080	5.9	9.8	6.2	---	1.4	17	< 0.50	< 0.20	< 0.10	< 1.0	0.68	15	60
BIBT1-17-3	27-Sep-2017	0.5 - 1.0m	1.3	0.56	7.45	0.61	7.6	270	0.41	0.59	13	< 0.080	8.0	17	8.6	---	1.8	24	0.58	< 0.20	0.14	< 1.0	0.89	22	79
	27-Sep-2017	1.0 - 1.5m	1.4	1.3	7.30	0.69	9.0	330	0.48	0.56	15	< 0.080	9.2	21	11	---	2.2	29	0.70	< 0.20	0.17	< 1.0	0.98	25	89
(Duplicate)	27-Sep-2017	1.0 - 1.5m	1.3	1.2	7.22	0.71	9.2	350	0.52	0.61	16	< 0.080	9.2	21	11	---	2.2	29	0.72	< 0.20	0.17	< 1.0	1.0	27	92
	27-Sep-2017	3.0 - 3.5m	0.83	0.69	7.47	< 0.50	6.4	190	< 0.40	0.41	10	< 0.080	6.5	12	6.5	---	1.7	20	< 0.50	< 0.20	< 0.10	< 1.0	0.78	18	63
BIBT1-TP-005	20-Jul-2014	0.95 - 1.05m	0.74	1.3	6.45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																				
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			2	5	(6 - 8)	20	12	500	4	10	52	0.4	50	63	140	6.6	10	45	1	20	1	50	23	130	200
CCME Residential/Parkland Coarse Sub-Surface [#2]			2	5	(6 - 8)	20	12	500	4	10	52	0.4	50	63	140	6.6	10	45	1	20	1	50	23	130	200

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Surface soils, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(b)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI BT1-09-1	14-Aug-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	62	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	91	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	3.3 - 3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	32	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI BT1-09-2	14-Aug-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	73	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	1.6 - 1.9m	5.5 [#1]	0.040	0.31	0.13	260 [#3]	55	160	36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	2.4 - 2.7m	11 [#1]	< 0.020	0.59	0.26	600 [#3]	220 [#3]	360 [#3]	96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	3.0 - 3.3m	4.6 [#2]	< 0.020	< 0.010	< 0.040	18	< 10	37	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	4.1 - 4.4m	0.25	< 0.020	< 0.010	< 0.040	< 12	< 10	53	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI BT1-09-3	14-Aug-2009	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	58	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	1.0 - 1.3m	2.0 [#1]	0.10 [#1]	0.16	4.9	530 [#3]	3700 [#3]	9400 [#3]	3900 [#3]	18000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	2.4 - 2.7m	32 [#1]	3.0 [#1]	27	130 [#1]	4300 [#3]	1100 [#3]	1500 [#3]	460	2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	4.0 - 4.3m	0.23	< 0.020	0.051	0.20	14	< 10	28	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2009	5.7 - 6.0m	0.16	< 0.020	0.043	0.19	12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-1	27-Aug-2010	0.0 - 0.3m	0.087	0.21 [#1]	0.12	0.51	32	< 10	53	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	2.2 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	38	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	5.7 - 6.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-2/10-1-3	28-Aug-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	110	64	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2010	1.0 - 1.3m	140 [#1]	410 [#1]	120 [#1]	860 [#1]	21000 [#3]	13000 [#3]	18000 [#3]	5400 [#3]	27000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Aug-2010	2.5 - 3.0m	0.39	0.23 [#1]	0.099	0.53	23	< 10	44	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Aug-2010	2.5 - 3.0m	1.3 [#1]	0.99 [#1]	0.45	2.9	140	38	110	22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-3	27-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	71	32	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	27-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	82	35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	1.8 - 2.1m	7.0 [#1]	< 0.020	1.3	0.27	87	16	62	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	3.7 - 4.0m	3.5 [#2]	< 0.020	2.4	3.3	470	< 10	41	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	4.2 - 4.5m	0.23	0.051	0.10	0.20	< 12	< 10	23	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	5.7 - 6.0m	0.24	0.45 [#2]	0.22	0.93	45	14	43	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-10-4/10-2-3	27-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	21	380 [#3]	210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	1.7 - 2.0m	0.049	< 0.020	1.6	0.28	910 [#3]	3500 [#3]	1000 [#3]	62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Aug-2010	3.2 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	32	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-1	23-Jul-2012	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	33	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	22	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-10	26-Jul-2012	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	110	1200 [#3]	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Jul-2012	3.0 - 3.5m	0.073	< 0.020	0.41	0.10	< 12	< 10	20	26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Jul-2012	4.5 - 5.0m	0.0095	< 0.020	0.046	< 0.040	< 12	< 10	26	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-2/BIBT1-12-1-5	23-Jul-2012	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	42	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	2.2 - 2.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	28	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	3.3 - 3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	44	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	4.5 - 5.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(b)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			**1**	**0.1**	**50**	**37**	---	---	---	---	---	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Residential/Parkland Coarse Sub-Surface [#2]			**1**	**0.1**	**50**	**37**	---	---	---	---	---	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Canada Wide Standards Surface [#3]			---	---	---	---	**210**	**150**	**300**	**2800**	**2800**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	**700**	**380**	**2500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-3	23-Jul-2012	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	42	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	3.5 - 4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	43	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	5.0 - 5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-4	23-Jul-2012	0.5 - 1.0m	0.029	< 0.020	0.020	< 0.040	< 12	< 10	48	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	40	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	31	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-5	23-Jul-2012	1.0 - 1.5m	0.030	< 0.020	< 0.010	< 0.040	< 12	< 10	35	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	2.5 - 3.0m	0.036	0.026	0.041	0.15	< 12	< 10	20	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-6/BIBT1-12-3-5	23-Jul-2012	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	41	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	29	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-7/BIBT1-12-2-5	23-Jul-2012	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	23	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2012	3.6 - 4.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Jul-2012	3.6 - 4.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-8	24-Jul-2012	1.0 - 1.5m	0.019	0.044	0.020	0.089	< 12	< 10	30	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	1.5 - 1.8m	< 0.40	< 0.060	11	11	**1300** [#3]	**430** [#3]	**590** [#3]	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	4.0 - 4.5m	< 0.51	**< 0.10** [#2]	18	36	**3500** [#4]	**1100** [#4]	1500	410	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	5.0 - 5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	26	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	6.5 - 7.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	10	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-12-9/BIBT1-12-4-5	24-Jul-2012	0.7 - 1.0m	0.012	0.024	< 0.010	< 0.040	< 12	13	30	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	3.0 - 3.5m	**14** [#2]	**82** [#2]	**53** [#2]	**230** [#2]	**8200** [#4]	**2500** [#4]	**3600** [#3]	1000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	24-Jul-2012	3.0 - 3.5m	**4.6** [#2]	**30** [#2]	20	**80** [#2]	**3600** [#4]	**1300** [#4]	**1900** [#3]	490	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	5.5 - 6.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	21	< 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	6.5 - 7.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	50	14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-1-3.5	29-Sep-2015	1.8m	**210** [#1]	**550** [#1]	**220** [#1]	**1000** [#1]	**27000** [#3]	**8800** [#3]	**19000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Sep-2015	1.8m	**86** [#1]	**280** [#1]	**80** [#1]	**400** [#1]	**13000** [#3]	**3100** [#3]	**6800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2015	2.4m	**87** [#1]	**190** [#1]	**61** [#1]	**280** [#1]	**11000** [#3]	**3100** [#3]	**7400** [#3]	---	**8200** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2015	3.6m	0.62	**0.95** [#2]	0.51	2.0	93	36	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Sep-2015	3.6m	**1.2** [#2]	**3.0** [#2]	1.4	7.2	350	30	83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2015	4.2m	0.064	0.077	0.023	0.10	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-2	25-Feb-2015	1.5m	**99** [#1]	**0.35** [#1]	**66** [#1]	**250** [#1]	**6700** [#3]	**1800** [#3]	**2600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-2-4	29-Sep-2015	1.2m	**100** [#1]	**310** [#1]	**73** [#1]	**390** [#1]	**16000** [#3]	**1600** [#3]	**2800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2015	2.4m	**44** [#1]	**60** [#1]	18	**85** [#1]	**3600** [#3]	**680** [#3]	**1200** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Sep-2015	2.4m	**42** [#1]	**33** [#1]	8.5	36	**1200** [#3]	**160** [#3]	**310** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2015	3.6m	**7.0** [#2]	**1.3** [#2]	0.59	2.2	110	18	56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-03	01-Oct-2015	1.2m	0.026	0.064	0.041	0.41	**360** [#3]	**6500** [#3]	**16000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Oct-2015	1.2m	0.024	0.063	0.038	0.40	**250** [#3]	**5700** [#3]	**15000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	13	**630** [#3]	**2200** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-4	25-Feb-2015	1.5m	**20** [#1]	< 0.020	22	**78** [#1]	**2000** [#3]	**180** [#3]	**370** [#3]	---	---	0.011	< 0.0050	< 0.0040	0.0057	0.0050	< 0.10	0.011	< 0.0050	0.011	< 0.0050	0.0084	0.026	0.0053	0.18	**0.18** [#1]	**0.078** [#1]	0.014

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(b)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-4-4	01-Oct-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2015	3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Oct-2015	3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-5-3	01-Oct-2015	1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Oct-2015	1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2015	3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-06	02-Oct-2015	2.4m	0.26	0.066	0.058	0.43	16	120	890 [#3]	---	---	< 0.0050	< 0.0050	< 0.0040	0.0063	< 0.0050	< 0.10	0.0084	< 0.0050	0.0069	< 0.0050	0.0077	0.0094	0.0066	0.16	0.050 [#1]	0.031	0.015
	02-Oct-2015	3.6m	1.4 [#2]	< 0.020	0.29	0.12	19	55	120	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	0.0058	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.093	0.011	0.019	0.0082
(Duplicate)	02-Oct-2015	3.6m	1.4 [#2]	< 0.020	0.31	0.17	34	48	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	02-Oct-2015	4.8m	2.0 [#2]	< 0.020	< 0.010	< 0.040	< 12	14	< 50	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0065	< 0.0050	0.0054	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.084	0.0068	0.012	0.0066
BIBT1-15-7-4	01-Oct-2015	2.4m	0.039	0.027	0.055	0.091	< 12	39	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2015	3.6m	0.10	0.28 [#2]	19	33	2900 [#4]	1100 [#4]	1800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	01-Oct-2015	3.6m	0.12	0.32 [#2]	25	43 [#2]	4200 [#4]	1400 [#4]	2100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-8-4	02-Oct-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	83	---	---	< 0.0050	< 0.0050	< 0.0040	0.0058	0.0065	< 0.10	0.013	< 0.0050	0.011	< 0.0050	0.011	0.0069	0.0065	0.21	0.014 [#1]	0.032	0.019
	02-Oct-2015	3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0070	< 0.0050	0.0058	< 0.0050	0.0059	< 0.0050	< 0.0050	0.12	0.0073	0.018	0.011
	02-Oct-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0061	< 0.0050
BIBT1-15-09	02-Oct-2015	1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	69	---	---	< 0.0050	< 0.0050	< 0.0040	0.0057	0.0051	< 0.10	0.012	< 0.0050	0.011	< 0.0050	0.0086	< 0.0050	0.0070	0.20	0.014 [#1]	0.028	0.015
	02-Oct-2015	3.6m	0.036	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0081	< 0.0050	0.0096	< 0.0050	0.0074	< 0.0050	0.0057	0.16	0.011	0.024	0.014
BIBT1-15-10	25-Feb-2015	1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Feb-2015	1.5m	0.013	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-15	25-Feb-2015	1.0m	5.1 [#1]	2.7 [#1]	2.4	10	670 [#3]	9700 [#3]	25000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-33	25-Feb-2015	1.0m	2.1 [#1]	4.5 [#1]	4.7	33	570 [#3]	6500 [#3]	13000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-37	25-Feb-2015	1.0m	150 [#1]	570 [#1]	180 [#1]	1200 [#1]	11000 [#3]	16000 [#3]	22000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-44	13-Mar-2015	1.8 - 2.5m	8.1 [#1]	8.8 [#1]	20	77 [#1]	3100 [#3]	1100 [#3]	1900 [#3]	---	---	0.10	0.19	0.14	0.072	0.044	< 0.10	0.070	0.018	0.10	0.0072	0.23	0.32 [#1]	0.026	0.92	1.0 [#1]	0.91 [#1]	0.22
BIBT1-15-45	13-Mar-2015	1.8 - 2.5m	19 [#1]	2.2 [#1]	18	62 [#1]	3500 [#3]	1600 [#3]	3100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-50	13-Mar-2015	1.8 - 2.5m	53 [#1]	1.4 [#1]	47	160 [#1]	7600 [#3]	7100 [#3]	11000 [#3]	---	---	0.43 [#1]	0.25	0.099	0.059	0.092	0.14	0.14	0.032	0.65	0.023	0.021	1.4 [#1]	0.026	1.5 [#1]	9.0 [#1]	3.2 [#1]	0.20
BIBT1-15-51	13-Mar-2015	1.8 - 2.5m	11 [#1]	0.036	26	26	4700 [#3]	2400 [#3]	3500 [#3]	---	3900 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-59	13-Mar-2015	1.5 - 2.0m	0.053	0.063	0.050	0.21	< 12	49	990 [#3]	---	2200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-60	13-Mar-2015	0.75m	0.026	< 0.020	0.035	0.10	< 12	130	1300 [#3]	---	2500	< 0.0050	0.007	0.0064	< 0.0050	0.020	< 0.10	0.031	< 0.0050	< 0.0050	0.0076	0.0065	0.0078	0.0059	0.24	0.016 [#1]	0.026	0.019
BIBT1-15-NTSP-1	25-Feb-2015	Unknown	3.1 [#1]	5.1 [#1]	5.9	40 [#1]	780 [#3]	5900 [#3]	9700 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-NTSP-2	25-Feb-2015	Unknown	7.5 [#1]	14 [#1]	12	85 [#1]	1500 [#3]	13000 [#3]	20000 [#3]	---	---	0.60 [#1]	0.42	< 0.0080	0.13	0.13	0.21	0.21	0.038	0.68	0.036	0.071	2.0 [#1]	0.047	2.4 [#1]	11 [#1]	5.1 [#1]	0.28
BIBT1-15-NTSP-3	25-Feb-2015	Unknown	23 [#1]	58 [#1]	30	230 [#1]	3500 [#3]	11000 [#3]	22000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Feb-2015	Unknown	19 [#1]	61 [#1]	29	220 [#1]	3000 [#3]	17000 [#3]	31000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-TSP-1	25-Feb-2015	Unknown	8.9 [#1]	1.9 [#1]	14	60 [#1]	1700 [#3]	6500 [#3]	12000 [#3]	---	---	0.26	0.15	< 0.0080	0.094	0.098	0.16	0.16	0.021	0.35	0.030	0.056	0.94 [#1]	0.033	1.5 [#1]	4.0 [#1]	2.3 [#1]	0.20
BIBT1-15-TSP-2	06-Mar-2015	Unknown	1.6 [#1]	0.62 [#1]	4.9	31	460 [#1,2,3]	7100 [#3]	16000 [#3]	---	20000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(b)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-TSP-3	06-Mar-2015	Unknown	**1.6** [#1]	**0.19** [#1]	2.5	17	**470** [#3]	**4000** [#3]	**13000** [#3]	---	**16000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-TSP-4	06-Mar-2015	Unknown	**3.6** [#1]	**1.2** [#1]	14	**83** [#1]	**1400** [#3]	**11000** [#3]	**22000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	06-Mar-2015	Unknown	**2.3** [#1]	**0.36** [#1]	5.7	34	**650** [#3]	**6800** [#3]	**16000** [#3]	---	**22000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-USP-1	06-Mar-2015	Unknown	0.053	**0.15** [#1]	0.14	1.2	33	**2800** [#3]	**13000** [#3]	---	**20000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-15-USP-2	06-Mar-2015	Unknown	0.054	0.069	0.083	0.78	53	**3200** [#3]	**13000** [#3]	---	**19000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-1	28-Feb-2016	0.3 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2016	1.5 - 1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	**300** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Feb-2016	1.5 - 1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	33	**400** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Feb-2016	2.5 - 2.8m	0.25	< 0.020	0.093	0.13	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-2	29-Feb-2016	1.2 - 1.4m	0.19	< 0.020	0.10	0.14	23	< 10	87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Feb-2016	2.0 - 2.3m	**1.4** [#1]	< 0.020	0.046	< 0.040	14	< 10	60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Feb-2016	3.2 - 3.4m	**1.2** [#2]	< 0.020	0.074	< 0.040	< 12	< 10	61	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-3	29-Feb-2016	0.5 - 0.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Feb-2016	2.2 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	77	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	29-Feb-2016	2.2 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Feb-2016	3.4 - 3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-10	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	190	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	2.5 - 3.0m	0.15	< 0.020	2.6	1.0	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Sep-2016	2.5 - 3.0m	0.38	< 0.020	1.5	0.65	20	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	3.0 - 3.5m	0.048	< 0.020	0.28	0.15	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	4.0 - 4.5m	0.044	< 0.020	< 0.010	< 0.040	< 12	12	74	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-11	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-12	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-13	29-Sep-2016	1.0 - 1.5m	< 0.0050	0.033	0.021	0.072	< 12	**850** [#3]	**8400** [#3]	---	**15000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2016	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	41	**540** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-4	26-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Sep-2016	3.0 - 3.5m	0.022	< 0.020	< 0.010	< 0.040	< 12	41	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-5	27-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	18	89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(b)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-6	27-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	24	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	27-Sep-2016	2.0 - 2.5m	0.014	< 0.020	< 0.010	< 0.040	< 12	22	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	3.0 - 3.5m	1.5 [#2]	< 0.020	< 0.010	< 0.040	< 12	11	65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	4.0 - 4.5m	1.9 [#2]	< 0.020	< 0.010	< 0.040	< 12	11	76	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-7	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	50	290	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	92	340 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	2.0 - 2.5m	0.11	< 0.020	< 0.010	< 0.040	< 12	17	75	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	3.0 - 3.5m	0.18	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	4.0 - 4.5m	0.66	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-8	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	20	95	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	52	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-16-9	28-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	19	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-17-1	27-Sep-2017	0.0 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-17-2	27-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2017	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-17-3	27-Sep-2017	0.5 - 1.0m	0.048	< 0.020	< 0.010	< 0.040	< 10	12	180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2017	1.0 - 1.5m	9.0 [#1]	8.1 [#1]	5.8	23	190	45	81	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	27-Sep-2017	1.0 - 1.5m	17 [#1]	23 [#1]	17	63 [#1]	1300 [#3]	1500 [#3]	2100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Sep-2017	3.0 - 3.5m	16 [#2]	2.9 [#2]	8.5	33	1600 [#4]	770 [#3]	1100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TP-001	20-Jul-2014	0.45 - 0.55m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	350 [#3]	2900 [#3]	---	4700 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	0.95 - 1.05m	2.9 [#1]	< 0.020	< 0.010	< 0.040	< 12	37	310 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TP-002	20-Jul-2014	0.45 - 0.55m	61 [#1]	35 [#1]	43	190 [#1]	4600 [#3]	12000 [#3]	20000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	0.95 - 1.05m	47 [#1]	10 [#1]	31	120 [#1]	4300 [#3]	2000 [#3]	3000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	1.45 - 1.55m	84 [#1]	40 [#1]	53 [#1]	230 [#1]	9900 [#3]	1400 [#3]	2100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Jul-2014	1.45 - 1.55m	64 [#1]	19 [#1]	44	190 [#1]	5900 [#3]	1200 [#3]	1700 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	2.45 - 2.55m	18 [#1]	< 0.020	0.34	< 0.040	42	< 10	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TP-003	20-Jul-2014	0.45 - 0.55m	18 [#1]	6.6 [#1]	7.0	45 [#1]	2600 [#3]	2100 [#3]	3400 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	0.95 - 1.05m	56 [#1]	24 [#1]	32	260 [#1]	9400 [#3]	3500 [#3]	5100 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	1.45 - 1.55m	35 [#1]	2.3 [#1]	21	84 [#1]	2700 [#3]	600 [#3]	840 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	2.45 - 2.55m	1.2 [#1]	< 0.020	0.10	0.23	22	12	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TP-004	20-Jul-2014	0.45 - 0.55m	3.0 [#1]	0.045	2.7	12	350 [#3]	5200 [#3]	13000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	0.95 - 1.05m	38 [#1]	13 [#1]	3.2	38 [#1]	2200 [#3]	9400 [#3]	16000 [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	1.45 - 1.55m	12 [#1]	0.25 [#1]	4.6	4.5	180	19	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	1.95 - 2.05m	5.0 [#1]	2.6 [#1]	0.78	4.1	170	93	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC									PAH																			
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50+}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(b)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TP-005	20-Jul-2014	0.45 - 0.55m	**48** [#1]	**21** [#1]	28	**190** [#1]	**5200** [#3]	**9600** [#3]	**13000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	0.95 - 1.05m	**110** [#1]	**64** [#1]	**50** [#1]	**200** [#1]	**6900** [#3]	**6700** [#3]	**9300** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	20-Jul-2014	0.95 - 1.05m	**110** [#1]	**71** [#1]	**53** [#1]	**210** [#1]	**7400** [#3]	**7400** [#3]	**10000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	20-Jul-2014	2.45 - 2.55m	**31** [#1]	**33** [#1]	17	**78** [#1]	**2500** [#3]	**410** [#3]	**600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TRENCH-01	11-Sep-2015	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	35	**680** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TRENCH-02	11-Sep-2015	1.0m	0.055	< 0.020	0.41	0.34	27	140	**330** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBT1-TRENCH-03	11-Sep-2015	1.0m	0.31	< 0.020	1.2	1.5	170	**1200** [#3]	**1800** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Coarse-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Coarse-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Inorganic Parameters and Phenols					Dissolved Metals														
		Cl (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIBT1-10-1-3	29-Sep-2010	**280** [#1]	7.06	< 0.003	0.003	**660** [#1]	0.029	**0.020** [#1]	< 0.02	< 0.00003	< 0.001	0.0011	**25** [#1]	0.0002	0.0028	0.028	**0.0025** [#1]	< 0.0001	< 0.0002	0.0009	0.015
BIBT1-10-2-3	29-Sep-2010	**180** [#1]	6.79	0.008	0.008	< 2	0.005	**0.0052** [#1]	< 0.02	< 0.00003	< 0.001	0.0019	**110** [#1]	< 0.0002	0.0024	0.011	0.0004	< 0.0001	< 0.0002	0.0079	0.008
	21-Aug-2011	**120** [#1]	7.27	0.007	< 0.003	< 2	< 0.01	**0.012** [#1]	< 0.02	< 0.00005	**< 0.01** [#1]	< 0.002	**120** [#1]	< 0.002	< 0.002	0.010	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.007	**0.03** [#1]
BIBT1-12-4-5	15-Aug-2012	24	7.22	0.0061	< 0.0030	**8.9** [#1]	0.0051	**0.021** [#1]	< 0.020	0.000057	< 0.0010	0.0036	**19** [#1]	0.00026	0.0019	0.037	**0.0022** [#1]	< 0.00010	< 0.00020	0.0081	0.012
	22-Aug-2013	16	7.25	0.0090	0.014	**16** [#1]	0.0058	0.0032	0.034	**0.00016** [#1]	< 0.0010	0.0016	**4.7** [#1]	0.00025	0.0012	0.042	**0.0026** [#1]	< 0.00010	< 0.00020	0.0059	0.018
BIBT1-15-1-3.5	27-Nov-2015	29	7.15	0.016	< 0.010	**500** [#1]	0.047	**0.033** [#1]	< 0.020	< 0.000020	0.0032	0.0013	**45** [#1]	< 0.00020	0.0059	0.032	**0.0027** [#1]	< 0.00010	< 0.00020	0.014	0.014
	08-Aug-2016	23	7.23	< 0.050	< 0.050	**410** [#1]	0.034	**0.019** [#1]	< 0.020	< 0.000020	0.0026	0.00025	**58** [#1]	< 0.00020	0.0060	0.016	**0.0016** [#1]	< 0.00010	< 0.00020	0.013	0.0095
	10-Aug-2017	13	---	< 0.010	< 0.010	**200** [#1]	0.015	**0.011** [#1]	< 0.020	< 0.000020	0.0012	0.00070	**28** [#1]	< 0.00020	0.0053	0.015	**0.0014** [#1]	< 0.00010	< 0.00020	**0.015** [#1]	0.0061
BIBT1-15-2-4	27-Nov-2015	9.7	7.08	< 0.010	< 0.050	**810** [#1]	0.088	**0.031** [#1]	< 0.020	< 0.000020	0.0027	0.0011	**42** [#1]	< 0.00020	0.0041	0.020	**0.0030** [#1]	< 0.00010	< 0.00020	0.0040	0.011
	08-Aug-2016	9.4	7.41	< 0.050	< 0.050	**850** [#1]	0.083	**0.029** [#1]	< 0.020	< 0.000020	0.0030	< 0.00020	**49** [#1]	< 0.00020	0.0046	0.016	**0.0024** [#1]	< 0.00010	< 0.00020	0.011	0.0034
(Duplicate)	08-Aug-2016	9.3	7.45	< 0.050	< 0.050	**850** [#1]	0.090	**0.030** [#1]	< 0.020	< 0.000020	0.0029	< 0.00020	**49** [#1]	< 0.00020	0.0047	0.017	**0.0021** [#1]	< 0.00010	< 0.00020	0.011	0.0052
	10-Aug-2017	8.8	---	< 0.010	< 0.010	**46** [#1]	0.032	**0.032** [#1]	< 0.020	< 0.000020	0.0020	0.00041	**34** [#1]	< 0.00020	0.0036	0.0045	0.00096	< 0.00010	< 0.00020	0.0040	0.0056
BIBT1-15-4-4	11-Aug-2017	**140** [#1]	---	0.29	< 0.010	**7.0** [#1]	0.0082	0.0021	0.028	0.000073	< 0.0010	0.0012	**1.1** [#1]	< 0.00020	0.0027	0.0091	0.00032	< 0.00010	< 0.00020	0.0063	0.0073
BIBT1-15-5-3	27-Nov-2015	71	7.21	< 0.010	< 0.010	< 2.0	< 0.0030	0.0039	< 0.020	0.000044	< 0.0010	0.0010	**16** [#1]	< 0.00020	0.0016	0.010	< 0.00020	< 0.00010	< 0.00020	0.0059	0.023
	08-Aug-2016	9.3	7.69	0.064	< 0.010	< 2.0	0.016	0.0014	< 0.020	0.000071	< 0.0010	0.00047	**0.66** [#1]	< 0.00020	0.0018	0.0071	< 0.00020	< 0.00010	< 0.00020	0.0032	0.0090
	11-Aug-2017	8.2	---	0.27	< 0.010	< 2.0	0.0040	0.00023	< 0.020	**0.00012** [#1]	< 0.0010	0.0020	< 0.060	< 0.00020	0.0026	0.0030	< 0.00020	< 0.00010	< 0.00020	0.0017	0.0090
BIBT1-15-7-4	27-Nov-2015	10	7.32	< 0.010	< 0.010	3.7	0.0053	**0.032** [#1]	0.032	< 0.000020	< 0.0010	0.00066	**17** [#1]	< 0.00020	0.0077	0.0080	< 0.00020	< 0.00010	< 0.00020	0.00090	0.0097
	08-Aug-2016	17	7.36	0.026	0.013	**< 4.0** [#1]	0.0049	0.00051	0.030	**0.00023** [#1]	< 0.0010	0.00079	0.075	< 0.00020	0.0011	0.025	0.00026	< 0.00010	< 0.00020	0.0048	**0.031** [#1]
	11-Aug-2017	11	---	0.097	< 0.010	**7.8** [#1]	0.0076	0.00056	< 0.020	**0.00017** [#1]	< 0.0010	0.0015	**2.9** [#1]	< 0.00020	0.00095	0.0091	< 0.00020	< 0.00010	< 0.00020	0.0026	0.025
BIBT1-15-8-4	10-Aug-2016	6.6	7.50	< 0.010	< 0.010	**8.1** [#1]	0.0074	0.0023	0.055	**0.00025** [#1]	< 0.0010	0.00066	**39** [#1]	< 0.00020	0.0027	0.067	< 0.00020	< 0.00010	< 0.00020	0.0066	**0.071** [#1]
BI BT1 09-1-4	22-Aug-2013	54	---	0.026	0.012	**15** [#2]	0.0060	0.00076	0.036	**0.00064** [#1]	< 0.0010	**0.0055** [#1]	**1.8** [#1]	< 0.00020	0.00041	0.030	0.00072	< 0.00010	< 0.00020	**0.028** [#1]	0.019
	03-Aug-2014	50	---	0.084	< 0.010	**13** [#2]	0.0053	0.00041	0.038	**0.00059** [#1]	< 0.0010	**0.0048** [#1]	**0.85** [#1]	< 0.00020	0.00044	0.025	0.00038	< 0.00010	< 0.00020	**0.031** [#1]	0.018
	07-Aug-2015	51	---	0.019	0.017	**30** [#2]	< 0.0030	0.00067	0.038	**0.00040** [#1]	< 0.0010	0.0021	**9.7** [#1]	< 0.00020	0.00054	0.027	0.00044	< 0.00010	< 0.00020	**0.025** [#1]	0.017
	08-Aug-2016	20	---	0.042	0.012	---	0.0040	0.00042	0.032	**0.00065** [#1]	< 0.0010	0.0036	**3.1** [#1]	< 0.00020	0.00042	0.024	0.00043	< 0.00010	< 0.00020	**0.025** [#1]	0.020
	10-Aug-2017	12	---	0.017	0.019	---	0.0048	0.00052	0.035	**0.00050** [#1]	< 0.0010	**0.0044** [#1]	**6.0** [#1]	< 0.00020	0.00054	0.029	0.00050	< 0.00010	< 0.00020	**0.025** [#1]	0.016
BI BT1 09-2-4	23-Aug-2010	**500** [#2,3]	7.14	0.005	0.003	**22** [#2]	0.004	0.0049	< 0.02	0.00004	< 0.001	0.0023	**31** [#1]	0.0003	0.0033	0.037	**0.0011** [#1]	< 0.0001	< 0.0002	**0.027** [#1]	0.010
	21-Aug-2011	**560** [#2,3]	7.21	< 0.03	< 0.03	**7** [#2]	0.02	**0.013** [#1]	< 0.02	0.00008	**< 0.01** [#1]	< 0.002	**110** [#1]	**< 0.002** [#1]	< 0.002	0.034	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	**0.022** [#1]	< 0.03
	15-Aug-2012	**520** [#2,3]	7.05	< 0.0030	< 0.0030	**4.9** [#2]	0.023	**0.017** [#1]	< 0.020	0.000054	0.0011	0.0017	**170** [#1]	0.00036	0.0012	0.021	**0.0015** [#1]	< 0.00010	< 0.00020	0.012	0.0058
	22-Aug-2013	**740** [#2,3]	---	0.18	0.024	**35** [#2,6]	0.030	**0.015** [#1]	0.021	< 0.000025	< 0.0010	0.00081	**160** [#1]	< 0.00020	0.0017	0.026	**0.0016** [#1]	< 0.00010	< 0.00020	0.012	0.0061
BIBT1-16-1-3	04-Oct-2016	15	7.02	< 0.010	< 0.010	---	0.0077	0.0042	0.032	**0.00016** [#1]	< 0.0010	0.0013	**52** [#1]	< 0.00020	0.0016	0.038	0.00029	< 0.00010	< 0.00020	0.0036	0.023
	11-Aug-2017	13	---	< 0.010	< 0.010	3.8	0.0052	0.00071	0.028	**0.00010** [#1]	< 0.0010	0.0010	**5.3** [#1]	< 0.00020	0.0035	0.0067	< 0.00020	< 0.00010	< 0.00020	0.0038	**0.037** [#1]
BIBT1-16-2-3	03-Oct-2016	14	7.29	< 0.010	< 0.010	**5.7** [#1]	0.0064	**0.010** [#1]	0.059	**0.00014** [#1]	< 0.0010	0.0012	**15** [#1]	< 0.00020	0.0012	0.027	0.00058	< 0.00010	< 0.00020	0.0042	0.015
	11-Aug-2017	17	---	< 0.010	< 0.010	3.4	0.0049	0.0022	0.034	**0.00016** [#1]	< 0.0010	0.00084	**13** [#1]	< 0.00020	0.0025	0.017	0.00025	< 0.00010	< 0.00020	0.0026	**0.031** [#1]

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300

		Inorganic Parameters and Phenols					Dissolved Metals														
Monitoring Station	**Date (dd-mmm-yyyy)**	**Cl (mg/L)**	**pH (pH Units)**	**Nitrate (as N) (mg/L)**	**Nitrite (as N) (mg/L)**	**Phenols (µg/L)**	**Aluminum (mg/L)**	**Arsenic (mg/L)**	**Boron (mg/L)**	**Cadmium (mg/L)**	**Chromium (Total) (mg/L)**	**Copper (mg/L)**	**Iron (mg/L)**	**Lead (mg/L)**	**Molybdenum (mg/L)**	**Nickel (mg/L)**	**Selenium (mg/L)**	**Silver (mg/L)**	**Thallium (mg/L)**	**Uranium (mg/L)**	**Zinc (mg/L)**
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIBT1-16-3-3	03-Oct-2016	13	7.42	0.012	< 0.010	3.3	0.0044	**0.0050 [#1]**	0.040	< 0.000020	< 0.0010	0.00056	**0.89 [#1]**	< 0.00020	0.0039	0.0086	0.00039	< 0.00010	< 0.00020	0.0045	0.0090
	11-Aug-2017	9.9	---	< 0.010	< 0.010	< 2.0	< 0.0030	0.0016	0.021	0.000029	< 0.0010	0.00056	**4.1 [#1]**	< 0.00020	0.0028	0.0056	< 0.00020	< 0.00010	< 0.00020	0.0029	0.0097
BI-14-13-3	03-Aug-14	5.5	7.15	0.48	0.048	**6.1 [#1]**	**0.0076 [#1]**	**0.019 [#1]**	< 0.020	< 0.000020	< 0.0010	< 0.00020	**33 [#1]**	< 0.00020	0.0042	0.0048	< 0.00020	< 0.00010	< 0.00020	0.0046	< 0.0030
	07-Aug-15	4.8	7.49	0.011	< 0.010	**12 [#1]**	< 0.0030	0.0030	< 0.020	0.000023	< 0.0010	< 0.00020	**15 [#1]**	0.00042	0.0050	0.0069	0.00028	< 0.00010	< 0.00020	0.0018	0.025
	09-Aug-16	4.9	7.61	< 0.010	0.011	3.8	0.0041	**0.0058 [#1]**	< 0.020	< 0.000020	< 0.0010	0.00083	**15 [#1]**	< 0.00020	0.0035	0.0062	0.00029	< 0.00010	< 0.00020	0.00086	0.020
	11-Aug-17	4.6	---	< 0.010	< 0.010	**6.9 [#1]**	0.0041	0.0030	0.036	0.000023	< 0.0010	0.00093	**0.62 [#1]**	< 0.00020	0.0023	0.0030	< 0.00020	< 0.00010	< 0.00020	0.0023	**1.1 [#1]**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. http://st-ts.ccme.ca/?chems=all&chapters=1 accessed Sept, 2015.)

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	PHC: Toluene (mg/L)	PHC: Ethylbenzene (mg/L)	PHC: Xylenes (Total) (mg/L)	PHC: PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC: PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	PAH: Anthracene (mg/L)	PAH: Benzo(a)Anthracene (mg/L)	PAH: Benzo(a)Pyrene (mg/L)	PAH: Fluoranthene (mg/L)	PAH: Fluorene (mg/L)	PAH: Naphthalene (mg/L)	PAH: Phenanthrene (mg/L)	PAH: Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
BIBT1-10-1-3	29-Sep-2010	**12** [#1]	**6.9** [#1]	**0.5** [#1]	3.4	< 0.1	3.8	---	---	---	---	---	---	---	---	---
BIBT1-10-2-3	29-Sep-2010	< 0.0004	< 0.0004	0.0015	< 0.0008	< 0.1	0.5	---	---	---	---	---	---	---	---	---
	21-Aug-2011	0.0014	< 0.0004	0.0039	< 0.0008	< 0.1	0.1	---	---	---	---	---	---	---	---	---
BI BT1 09-1-4	22-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	10-Aug-2017	0.0023	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI BT1 09-2-4	23-Aug-2010	**1.3** [#1,2]	< 0.0004	0.0010	< 0.0008	0.25	0.2	---	---	---	---	---	---	---	---	---
	21-Aug-2011	0.36	< 0.0004	0.0007	< 0.0008	0.22	0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	**1.2** [#1,2]	< 0.00040	0.00083	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	22-Aug-2013	**0.69** [#1]	< 0.00040	0.00072	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-12-4-5	15-Aug-2012	0.22	**0.89** [#1]	**0.35** [#1]	1.4	11	22	---	---	---	---	---	---	---	---	---
	22-Aug-2013	0.00097	0.00096	0.00042	0.0038	0.39	4.8	---	---	---	---	---	---	---	---	---
BIBT1-15-1-3.5	27-Nov-2015	**22** [#1]	**7.7** [#1]	**0.44** [#1]	1.5	11	1.4	---	---	---	---	---	---	---	---	---
	08-Aug-2016	**21** [#1]	**0.98** [#1]	**0.25** [#1]	0.75	< 0.1	0.35	---	---	---	---	---	---	---	---	---
	10-Aug-2017	**12** [#1]	**0.0070** [#1]	0.063	0.051	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-15-2-4	27-Nov-2015	**17** [#1]	**7.4** [#1]	**0.6** [#1]	2.5	10	0.80	---	---	---	---	---	---	---	---	---
	08-Aug-2016	**18** [#1]	**4.3** [#1]	**0.42** [#1]	2.2	< 0.1	0.64	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2016	**17** [#1]	**4** [#1]	**0.37** [#1]	2.2	< 0.1	0.62	---	---	---	---	---	---	---	---	---
	10-Aug-2017	**11** [#1]	**0.24** [#1]	**0.36** [#1]	1.1	< 0.10	0.24	---	---	---	---	---	---	---	---	---
BIBT1-15-4-4	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-15-5-3	27-Nov-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	27-Nov-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-15-7-4	27-Nov-2015	0.0061	**0.0048** [#1]	**0.51** [#1]	0.65	2.2	1.4	---	---	---	---	---	---	---	---	---
	08-Aug-2016	0.0010	< 0.00040	0.0012	0.0057	0.85	2.3	---	---	---	---	---	---	---	---	---
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

		PHC						PAH								
Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
BIBT1-15-8-4	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-16-1-3	04-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-16-2-3	03-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIBT1-16-3-3	03-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI-14-13-3	03-Aug-14	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-15	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Aug-16	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-17	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. http://st-ts.ccme.ca/?chems=all&chapters=1 accessed Sept, 2015.)

Appendix 10 Conceptual Site Model: Bear Island Sumps



Imperial

Conceptual Site Model

Bear Island Sumps (APEC BI-4 and BI-15), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0001

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0001 - Conceptual Site Model: Bear Island Sumps (APEC BI-4 and BI-15), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	A. Haigh	M. Brown	S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 1

Figures

Figure 1 Site Location Map

Figure 2A Historical Air Photo 1992 (Sumps 1-5)

Figure 2B Sump 6 – Historical Air Photo 1997 (Sump 6)

Figure 3 Site Plan Showing Topography

Figure 4A Site Plan Showing Sampling Locations (Sumps 1-5)

Figure 4B Site Plan Showing Sampling Locations (Sump 6)

Figure 5A Cross Section Locations (Sumps 1-5)

Figure 5B Cross Section A-A' (Sumps 1-5; North to South)

Figure 5C Cross Section B-B' (Sumps 1-5; West to East)

Figure 5D Site Plan 3-D Visualization (Sump 6)

Figure 5E Cross Section A-A' (Sump 6; South to North)

Figure 6A Soil Analytical Results: Inorganic Parameters (Sumps 1-5)

Figure 6B Soil Analytical Results: Inorganic Parameters (Sump 6)

Figure 6C Soil Analytical Results: Organic Parameters (Sumps 1-5)

Figure 6D Soil Analytical Results: Organic Parameters (Sump 6)

Figure 7A Groundwater and Surface Water Analytical Results: Inorganic Parameters (Sumps 1-5)

Figure 7B Groundwater and Surface Water Analytical Results: Inorganic Parameters (Sumps 6)

Figure 7C Groundwater and Surface Water Analytical Results: Organic Parameters (Sumps 1-5)

Figure 7D Groundwater and Surface Water Analytical Results: Organic Parameters (Sumps 6)

Figure 8A Conceptual Site Model (Sumps 1-5)

Figure 8B Conceptual Site Model (Sumps 6)

Figure 9 Conceptual Exposure Model

Tables

Table 1A Soil Analytical Results Sumps 1-5: Inorganic Parameters

Table 1BA Soil Analytical Results Sump 6: Inorganic Parameters

Table 2A Soil Analytical Results Sumps 1-5: Organic Parameters

Table 2B Soil Analytical Results Sump 6: Inorganic Parameters

Table 3 Water Analytical Results: Inorganic Parameters

Table 4 Water Analytical Results: Total Metals

Table 5 Water Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE	
Site Description:	Sumps 1 through 5: Wetland areas over collapsed sumps 1, 2, 3, 4, 5. Raised access road surrounding Sumps 1 and 2. Unnamed lake south of Sumps 3, 4 and 5 (Figure 1). Sump 6: Wetland Area with no surrounding infrastructure. Unnamed lakes to the NE and SW (Figure 1)
Current Land Use:	CCME Industrial land use.
Future Land Use:	CCME Parkland land use.
HISTORICAL LAND USE	
Infrastructure type:	Waste Fluid Sumps (Figure 2A and 2B).
Notes:	Primarily Drilling Fluids.
Years Active:	Sumps 1 through 5: From air photos, interpreted to be circa 1983 to approximately 1992 (Figure 2A). Sump 6: From air photos, interpreted to be circa 1996 to approximately early 2000's.
SITE SETTING	
Topography and Drainage:	Sumps 1 through 5: Site is generally flat with little evidence of surface water drainage from collapsed sump areas (Figure 3). Sump 6: Site slopes gently to the north. Area to northeast of site slopes sharply to an unnamed lake (Figure 3).
Nearby Surface Water Bodies (Distance and Direction):	Sumps 1 through 5: Unnamed Lake (60 m south at closest point). Mackenzie River (370 m north at closest point) (Figure 1). Sump 6: Unnamed Lake (50 m southwest). Unnamed Lake (60 m northeast). Mackenzie River (250 m north) (Figure 1).
SOIL AND GROUNDWATER CONDITIONS	
Surficial Materials:	Sumps 1 through 5: Clayey sand, silty sand. Sump 6: Silt, Sandy Silt.
Depth to Permafrost:	Sumps 1 through 5: ~ 0.6 to 2.8 mbgs – Discontinuous, not encountered in some locations due to limited depth of investigation. Sump 6: ~ 0.1 to 4.0 mbgs.

Depth to Bedrock:	Sumps 1 through 5: not encountered to an investigation depth of 4.8 mbgs. Sump 6: not encountered to an investigation depth of 4.5 mbgs.
Bedrock Lithology:	not encountered.
Number of Groundwater-Bearing Zones:	1
Number of Piezometers:	Sumps 1 through 5: 21 current, 3 historical now destroyed/decommissioned. Sump 6: 7 current, 0 historical now destroyed/decommissioned.
Free Product in Upper GW-Bearing Zone:	Sumps 1 through 5: not encountered. Sump 6: not encountered.
Free Product in Secondary GW-Bearing Zone:	Sumps 1 through 5: NA. Sump 6: NA.
<u>First Groundwater-Bearing Zone</u>	
Primary Soil Type/Lithology:	Sumps 1 through 5: Clayey sand, silty sand. Sump 6: Silt, Sandy Silt.
Dominant Grain Size:	Fine (assumed porosity n=0.1)
Depth to Groundwater Surface:	Sumps 1 through 5: ~ 0.5 – 1.8 mbgs Sump 6: ~ 0.7 – 2.5 mbgs
Hydraulic Conductivity (Minimum):	Sumps 1 through 5: 8.8 x 10^{-8} m/s Sump 6: 8.5 x 10^{-7} m/s
Hydraulic Conductivity (Maximum):	Sumps 1 through 5: 3.7 x 10^{-7} m/s Sump 6: 3.4 x 10^{-6} m/s
Hydraulic Conductivity (Geometric Mean K):	Sumps 1 through 5: 1.8 x 10^{-7} m/s Sump 6: 1.8 x 10^{-6} m/s
Vertical Hydraulic Gradient:	Not assessed (underlain by discontinuous permafrost; wells have only been installed in uppermost water-bearing zone).
Lateral Hydraulic Gradient (I):	Sumps 1 through 5: Area is interpreted to have negligible lateral hydraulic gradient. Sump 6: Area is interpreted to have negligible lateral hydraulic gradient. Area directly north slopes sharply to an unnamed lake, lateral hydraulic gradient estimated to be 0.1.
Groundwater Flow Direction and Velocity:	Sumps 1 through 5: Northwest towards Mackenzie River or south towards unnamed lake; velocity not calculated as lateral gradients are poorly defined. Sump 6: Northeast towards unnamed lake; velocity not calculated.

HISTORICAL ENVIRONMENTAL ACTIVITIES	
Soil and groundwater characterization (1997 to present)	
CURRENT STATUS	
Remaining soil and groundwater impacts (Figures 6A-D and 7A-D)	

Sources and Impacts

SOURCES	
Historical Sources:	Buried Drilling Waste.
Current Sources:	Impacted soil and groundwater (secondary source).
KNOWN ENVIRONMENTAL CONCERNS	
a. Soil	
Potential Contaminants of Concern:	Petroleum hydrocarbons (PHCs), salinity, metals, PAHs.
Proven Contaminants of Concern:	Sumps 1 through 5: PHCs - BTEX, PHC F1 to F4G. Salinity – EC, SAR – may be partially attributable to natural background. Sump 6: PHCs – BTEX, PHC F1 to F3. Salinity – EC, SAR.
Lateral Delineation:	Sumps 1 through 5: Lateral delineation of sumps areas not fully achieved. Some delineation around individual sumps to the east and north. Potential for unrelated sources encountered during delineation drilling attempts (for example, Former AST area southeast of Sump #1, Figure 2A). Large footprint of sumps, limited access due to wet ground and dense brush, separate adjacent APECs (BIBT1, R-36X) and above-ground infrastructure limit potential delineation in several areas. Sump 6: Lateral delineation not fully achieved. PHC impacts are fully delineated. Salinity impacts are delineated to the south only, topography toward lake to the northeast is an issue.

Vertical Delineation:	Sumps 1 through 5: Vertical delineation of PHC and salinity not achieved for identified impacts at approximately 4.5 mbgs. Sump 6: Vertical delineation of PHC impacts achieved at approximately 3.5 mbgs. Salinity impacts not delineated to a depth of approximately 4.5 mbgs.
b. Groundwater	
Potential Contaminants of Concern:	Petroleum hydrocarbons, metals, phenols, PAHs, salinity.
Proven Contaminants of Concern:	Sumps 1 through 5: PHCs - BTEX, PHC F1 to F2 Chloride Metals – may be partially attributable to natural background Phenols – may be partially attributable to natural background Sump 6: Chloride, Metals, Phenols
Presence of Free Product:	No free phase identified during recent events
Lateral Delineation:	Sumps 1 through 5: Chloride, metals and phenol impact delineation is incomplete. May be partially attributable to natural background. Most wells are in, or directly adjacent to the sumps, and are for characterization, not delineation purposes. PHC impacts only appear southeast of Sump 2 and may be associated with a separate APEC. They are not delineated. Sump 6: Chloride impacts are delineated to the south, east and west. Delineation to the north, towards and unnamed water body, has not been achieved. Phenols and metals above guideline are observed in all groundwater wells and the unnamed water body. May be partially attributable to natural background.
Vertical Delineation:	Only the upper groundwater-bearing zone to approximately 2-4 mbgs is currently instrumented. Permafrost has been noted in a few local boreholes between 0.1 and 4 mbgs and may provide a hydraulic barrier at depth, however, permafrost is discontinuous, particularly around Sumps 1 through 5.

Migration Pathways and Receptors

MIGRATION PATHWAYS

Summarized in Figure 8 and 9. Potential pathways include direct contact with soil, leaching from soil to groundwater, lateral migration in groundwater and discharge to surface water.

RECEPTORS

Summarized in Figures 8 and 9. Main receptors of interest are plants and invertebrates, and wildlife accessing local surface water collected in collapsed Sumps 1 through 5, or natural surface water bodies adjacent to sumps.

EXPOSURE PATHWAYS

Summarized in Figures 8 and 9

Synopsis of Conceptual Risk

In terms of soil related exposure pathways, human, ecological, microbial and wildlife contact or ingestion are potentially active at the sites. The pathway for leaching from soil to groundwater is active, as salinity impacts are found in shallow groundwater. Plants and soil invertebrates may be receptors in the rooting zone of shallow soils.

In terms of groundwater related exposure pathways, PHCs exceeding the applied guidelines are generally not found in groundwater at the Sumps. Chloride and phenol concentrations in groundwater have the potential to discharge to local surface water bodies, or could be present in the surface water above the collapsed sumps. Groundwater flow appears to be relatively stagnant in the area, potentially confined by discontinuous permafrost laterally and vertically. As such the exposure scenarios related to wildlife watering and freshwater aquatic life at the water bodies within the collapsed sumps and to the south would be considered complete and potentially active. Discharge to the Mackenzie River is unlikely based on current delineation and poorly defined lateral gradients. In terms of groundwater consumption, the exposure scenario is incomplete for both humans and wildlife. Human drinking water is sourced locally from the Mackenzie River on the opposite aside of the river, and is treated by the Town of Norman Wells before use.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

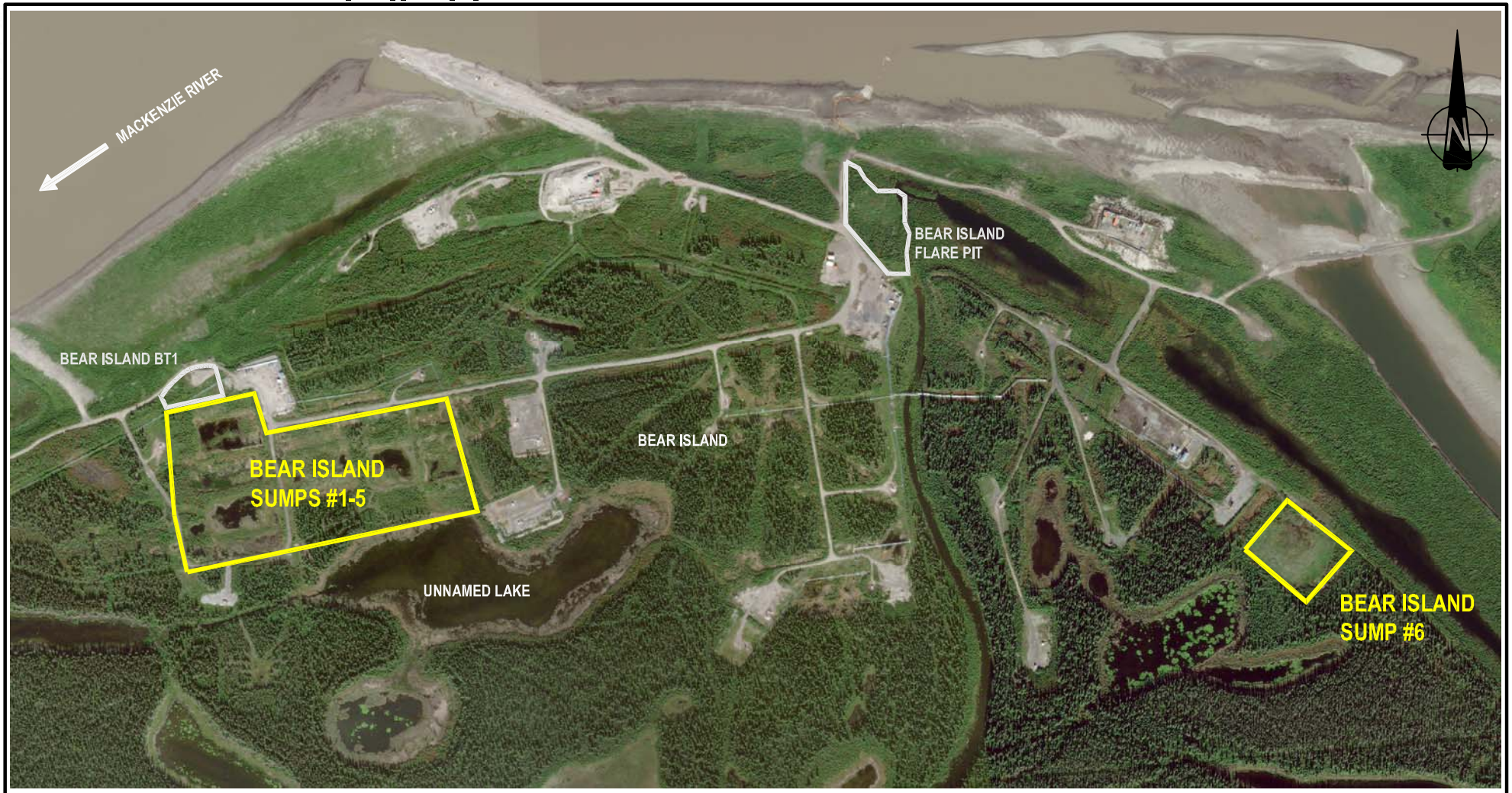
If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion.

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 300 400 500 m

1:10000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	17-APR-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No 1

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 12:49:26 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 12:14:31 PM ISSUING OFFICE: eCAD



m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1992 (SUMPS 1-5)

Date:	25-APR-18	Drawn by:	OTHERS	Edited by:	B.M.F.	App'd by:	

Advisian
WorleyParsons Group

WorleyParsons Project No. 407011-00622-400

FIG No 2A

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 9:02:22 AM USER NAME: blair.fitz
SAVE DATE & TIME: 27/4/2018 11:07:54 AM ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BIS_AIRPHOTOS_1992_1997.DWG



m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1997 (SUMP #6)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	BMF	-	M.B.

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No: 2B

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 9:03:19 AM
SAVE DATE & TIME: 27/4/2018 11:07:54 AM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BIS_AIRPHOTOS_1992_1997.DWG



Site Boundary

Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 100 200

Metres

1:6,000

NAD 1983 UTM Zone 9N

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	Drawn by:	Edited by:	App'd by:
30-MAY-18	T.G.	T.G.	D.G.

WorleyParsons Project No.
407011-00622-400

FIG No 3

REV 0

OneWay to zero harm

Advisian
WorleyParsons Group

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:40:21 PM
USER NAME: Tom Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\BIS\BearIslandSumps_Topography_Rev0.mxd



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- TEST PIT LOCATION
- SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING SAMPLING LOCATIONS (SUMPS 1-5)

Date:	25-APR-18	Drawn by:	OTHERS	Edited by:	B.M.F.	App'd by:	MF

Advisian
WorleyParsons Group

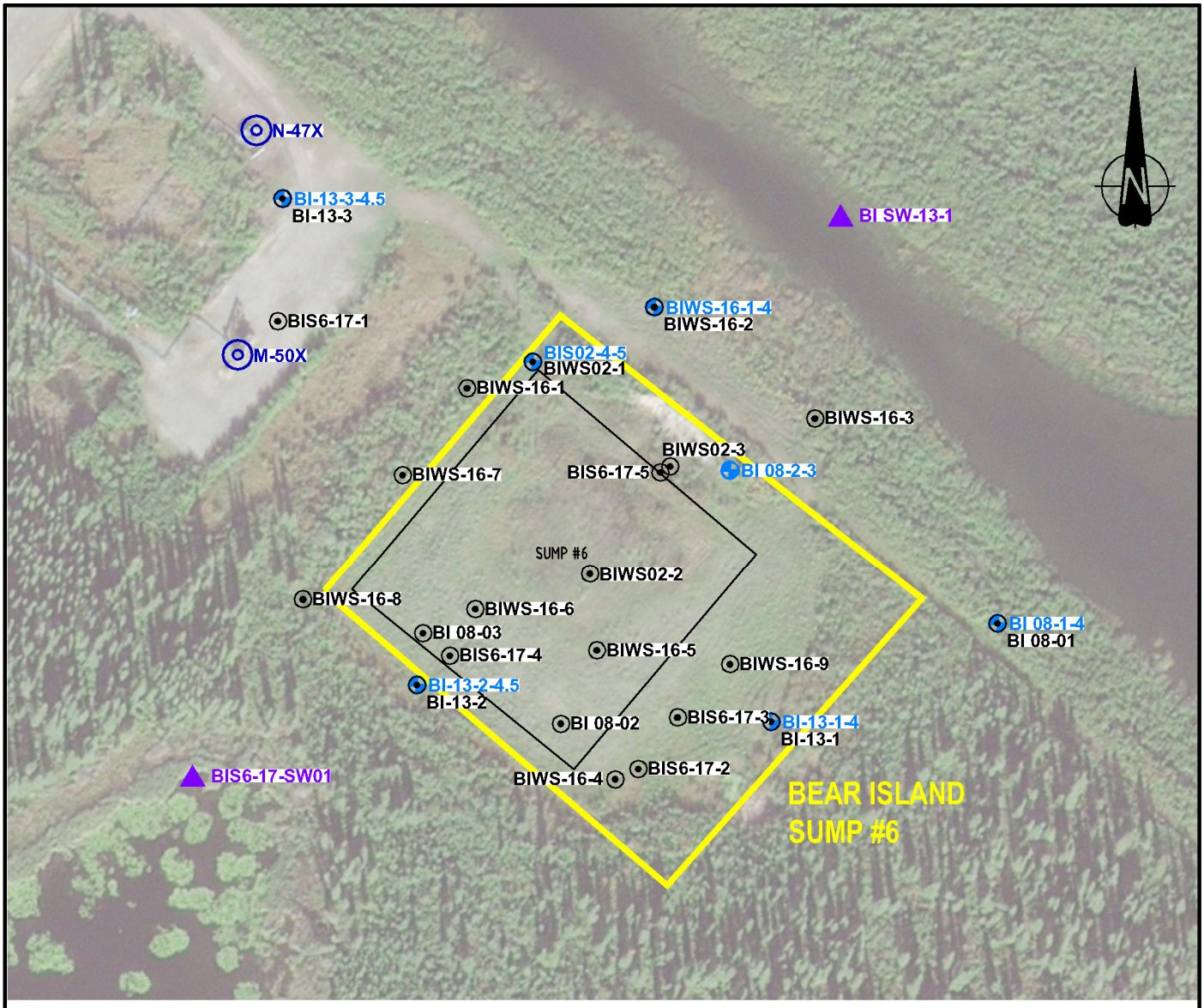
WorleyParsons Project No. 407011-00622-400

FIG No 4A | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 8:49:01 AM
SAVE DATE & TIME: 15/5/2018 8:47:08 AM
USER NAME: blair.fox
ISSUING OFFICE: CALGARY

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- TEST PIT LOCATION
- SURFACE WATER SAMPLE LOCATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 — 50 — 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SITE PLAN SHOWING SAMPLING LOCATIONS (SUMP 6)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	OTHERS	BMF	ME

Advisian
WorleyParsons Group

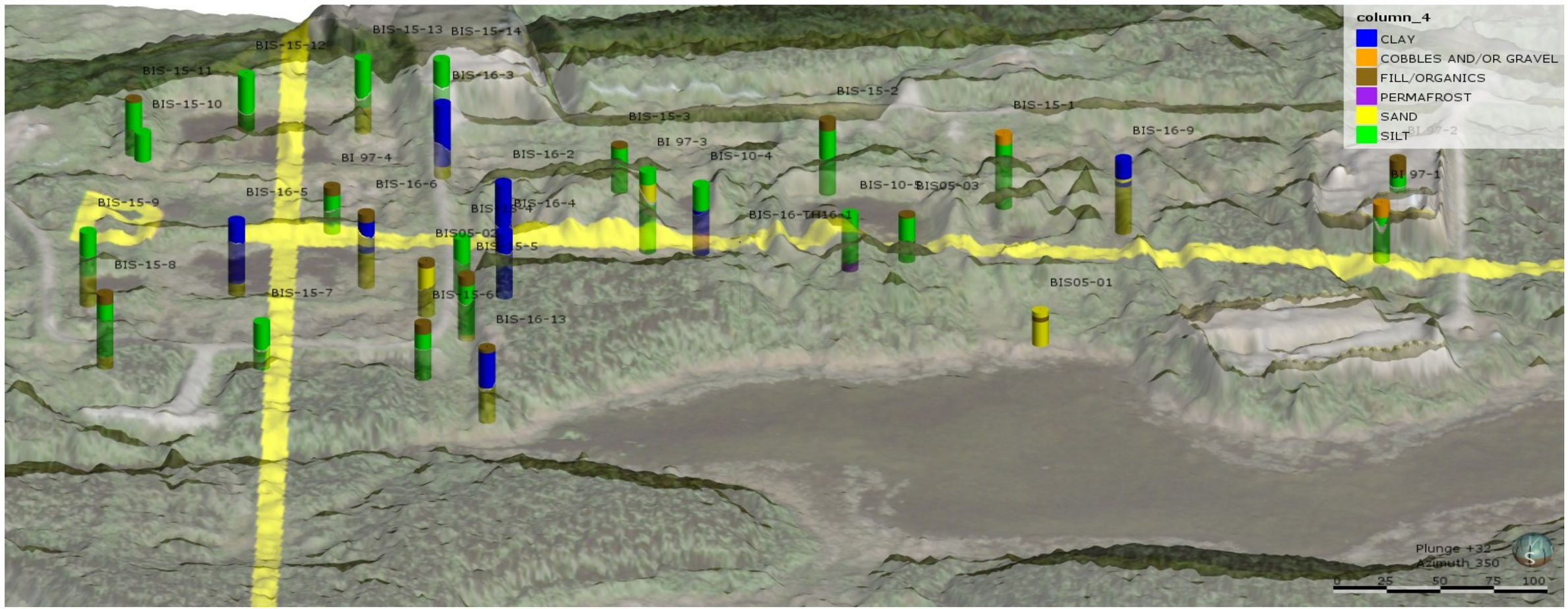
WorleyParsons Project No.
407011-00622-400

FIG No: 4B
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 15/5/2018 8:55:13 AM
SAVE DATE & TIME: 15/5/2018 8:47:06 AM
USER NAME: blair.fink
ISSUING OFFICE: eCAD



IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION (SUMPS 1-5)

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	AH	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622

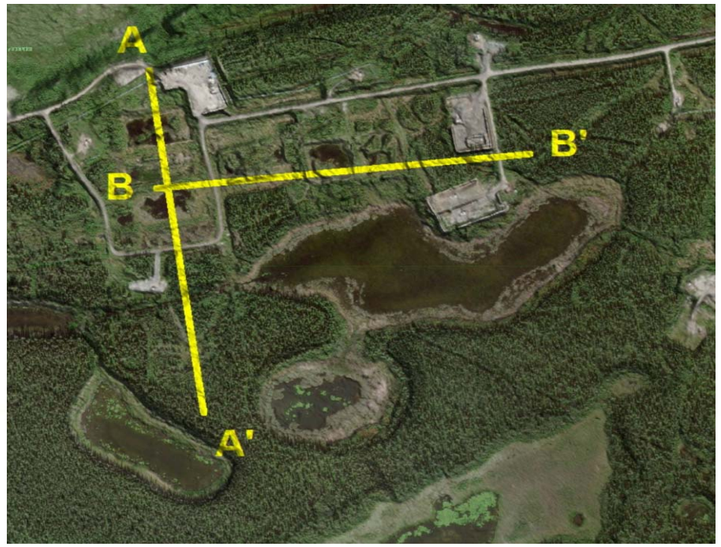
FIG No.: 5A

REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

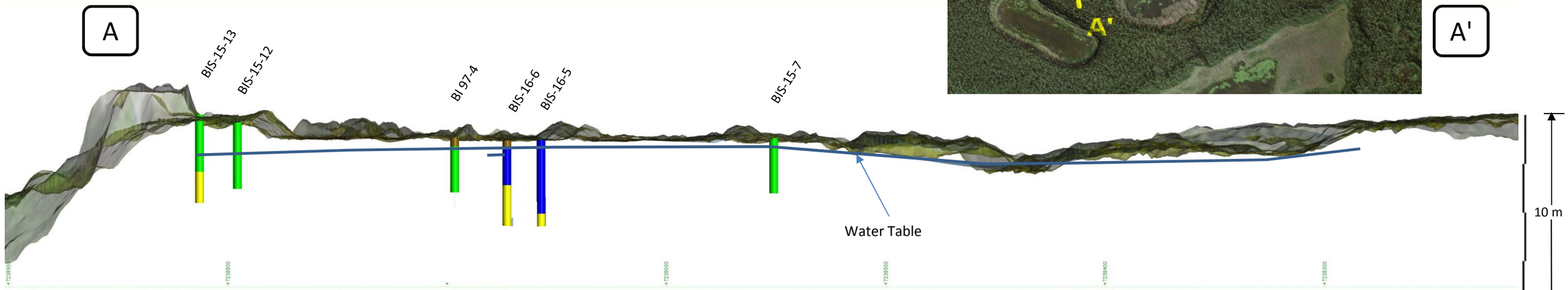
FILE LOCATION: CALGARY

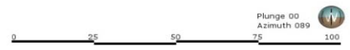
FILE DIRECTORY: U:\CALIGBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS



A

A'





- CLAY
- COBBLES AND/OR GRAVEL
- FILL/ORGANICS
- PERMAFROST
- SAND
- SILT

NOTES: 5x Vertical Exaggeration
Cross-Section width is 100 m

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

CROSS-SECTION A-A' (SUMPS 1-5; NORTH TO SOUTH)

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	AH	MB

WorleyParsons Project No.: 407011-00622

FIG No.: 5B

REV: A

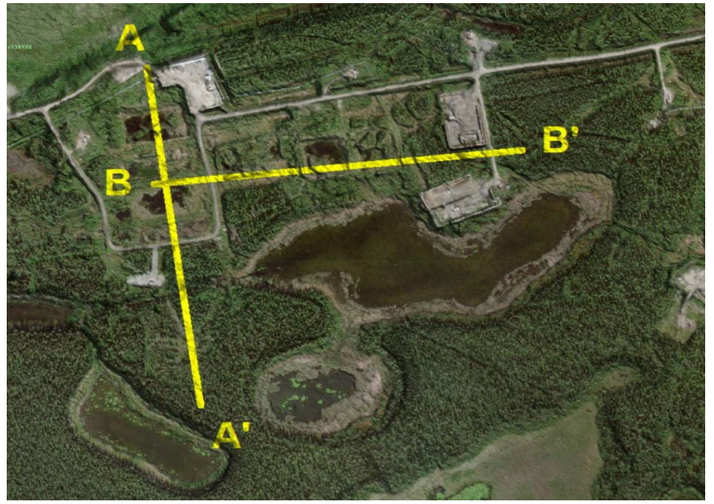
OneWay™ to zero harm

Advisian
WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

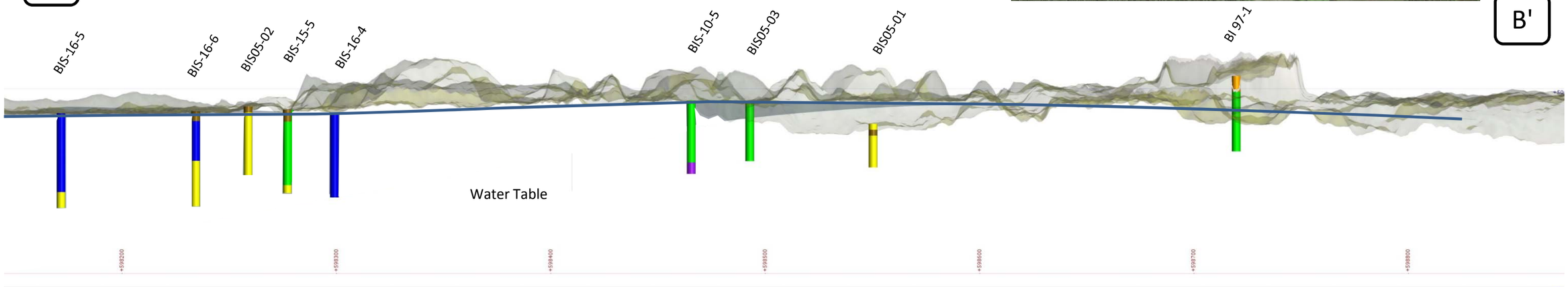
FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALIGBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS



B

B'



Plunge 00
Azimuth 346

0 25 50 75 100

- CLAY
- COBBLES AND/OR GRAVEL
- FILL/ORGANICS
- PERMAFROST
- SAND
- SILT

NOTES: 10x Vertical Exaggeration
Cross-Section width is 100 m

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

CROSS-SECTION B-B' (SUMPS 1 TO 5; WEST TO EAST)

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	AH	MB

OneWay to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622

FIG No. 5C

REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALGBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS



NORTH

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION (SUMP 6)

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	AH	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622

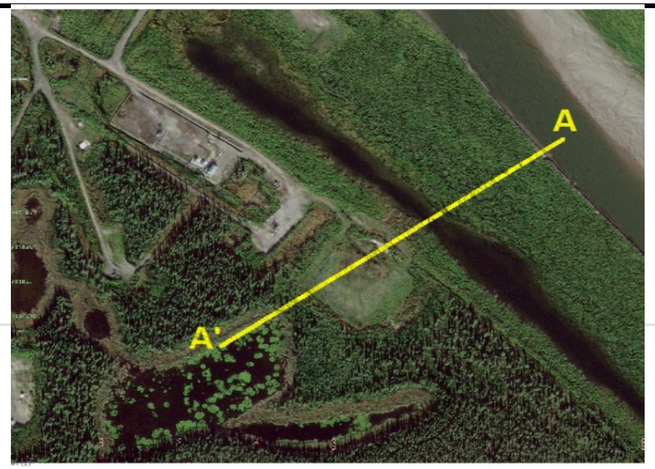
FIG No. 5D

REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALIGBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS



Plunge 00
Azimuth 156

0 25 50 75

- CLAY
- COBBLES AND/OR GRAVEL
- FILL/ORGANICS
- PERMAFROST
- SAND
- SILT

NOTES: 5x Vertical Exaggeration
Cross-Section width is 25 m

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

CROSS-SECTION A-A' (SUMP 6; SOUTH TO NORTH)

Date:	Drawn by:	Edited by:	App'd by:
18-May-18	AM	AH	MB

WorleyParsons Project No.: 407011-00622

FIG No.: 5E

REV: A

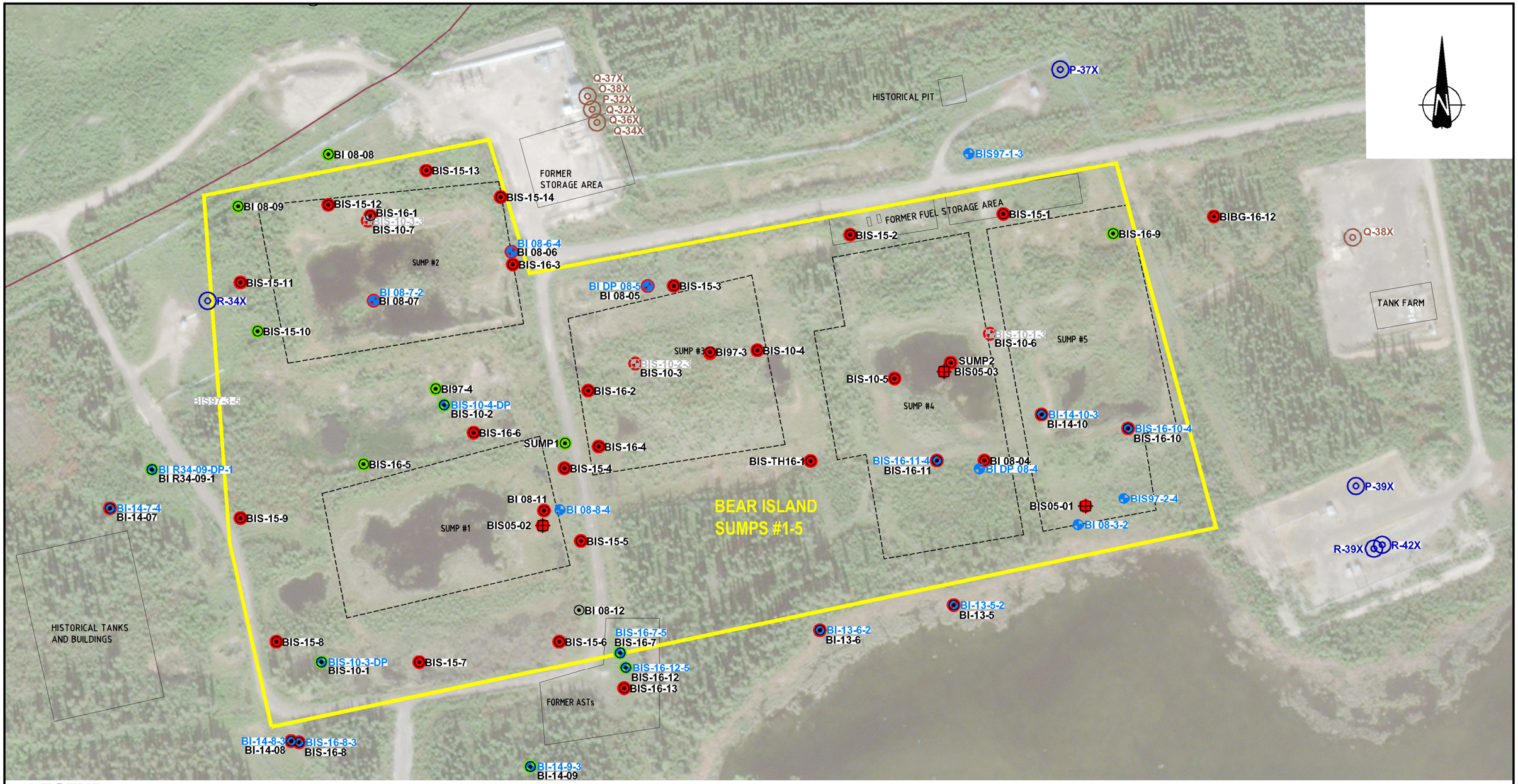
OneWay™ to zero harm

Advisian
WorleyParsons Group

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- TEST PIT LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL

WERE ANALYZED, SHOWN IN GREEN.

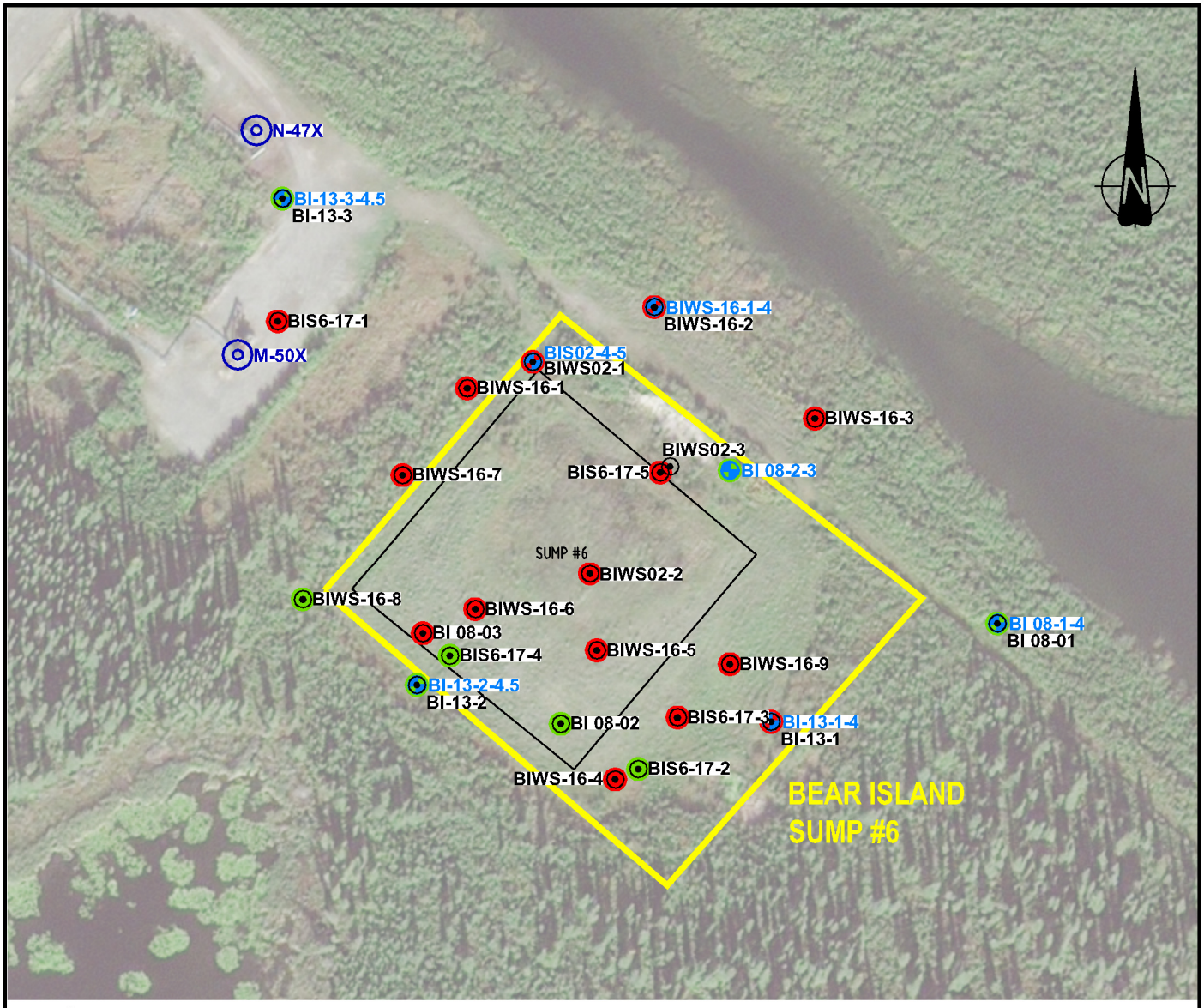
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS: INORGANIC PARAMETERS (SUMPS 1-5)

Date: 14-MAY-18	Drawn by: OTHERS	Edited by: B.M.F.	App'd by: MB
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-400	
		FIG No 6A	REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- TEST PIT LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS:
INORGANIC PARAMETERS (SUMP 6)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

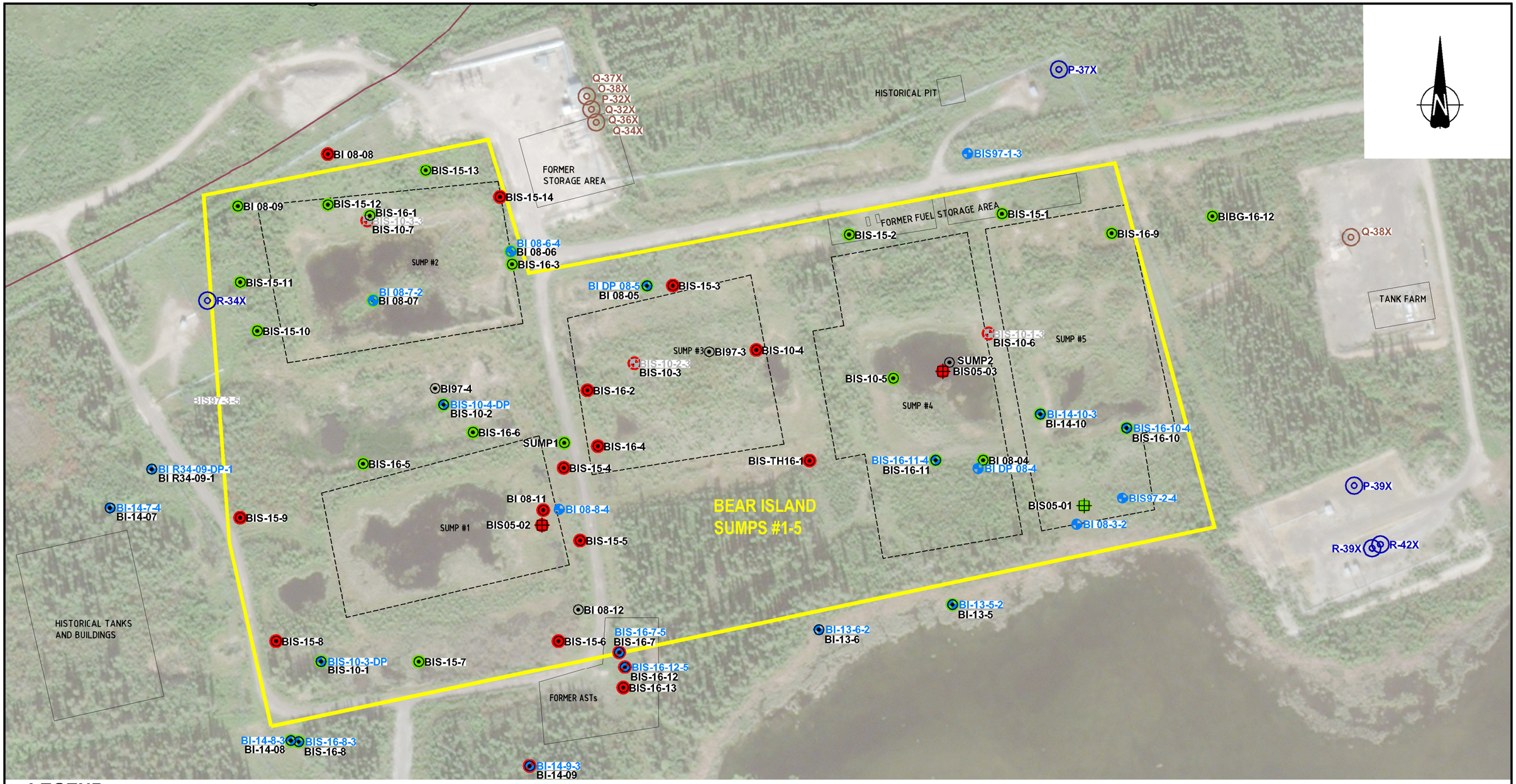
WorleyParsons Project No.
407011-00622-400

FIG No: 6B
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blair.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 15/5/2018 8:55:47 AM
SAVE DATE & TIME: 15/5/2018 8:47:06 AM

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- TEST PIT LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

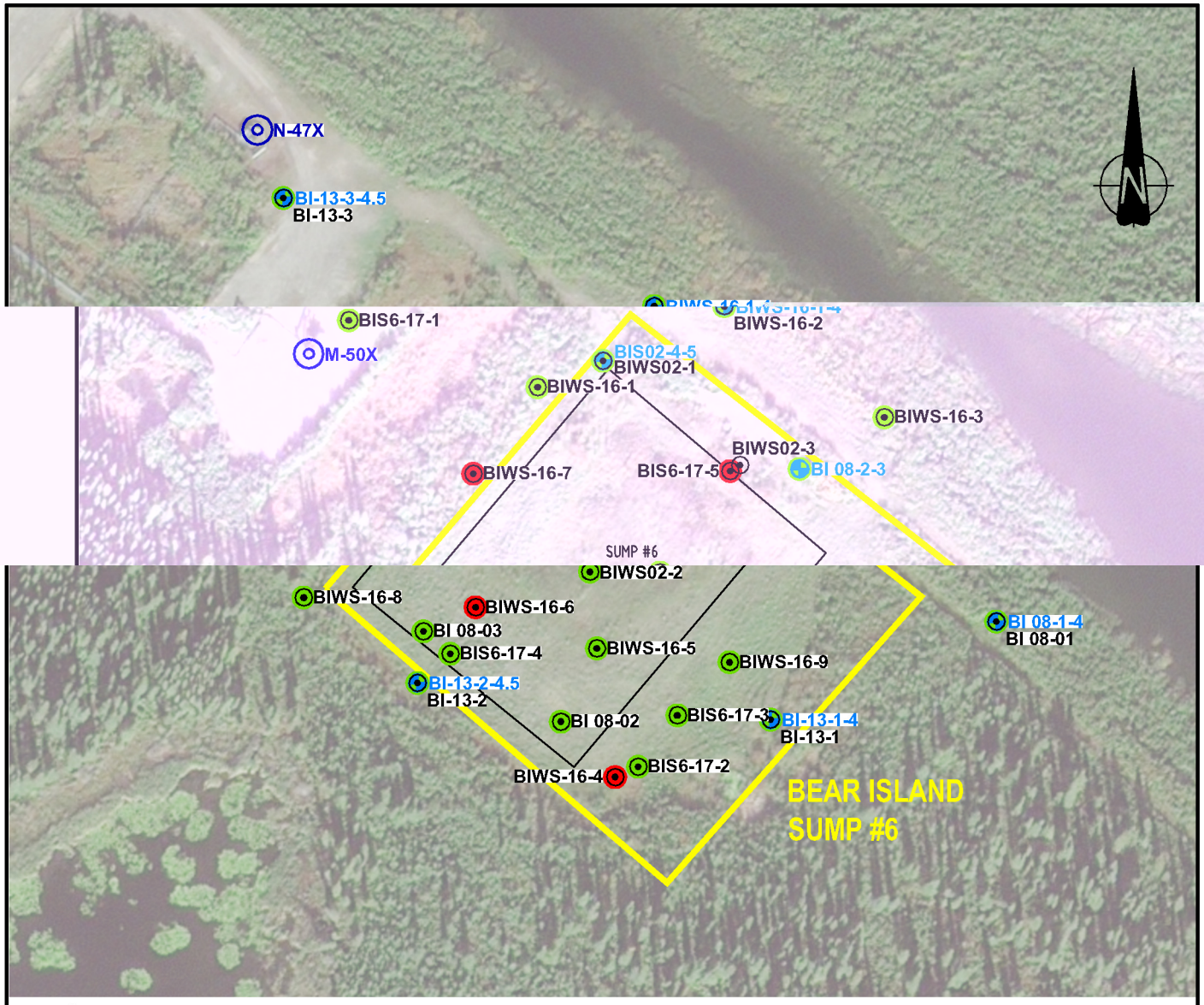
SOIL ANALYTICAL RESULTS:
ORGANIC PARAMETERS (SUMPS 1-5)

Date: 25-APR-18	Drawn by: OTHERS	Edited by: B.M.F.	App'd by: MB
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-400	
		FIG No 6C	REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 15/5/2018 8:50:19 AM USER NAME: blair.fink
SAVE DATE & TIME: 15/5/2018 8:47:06 AM ISSUING OFFICE: CALGARY



LEGEND

- INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- TEST PIT LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS:
ORGANIC PARAMETERS (SUMP 6)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

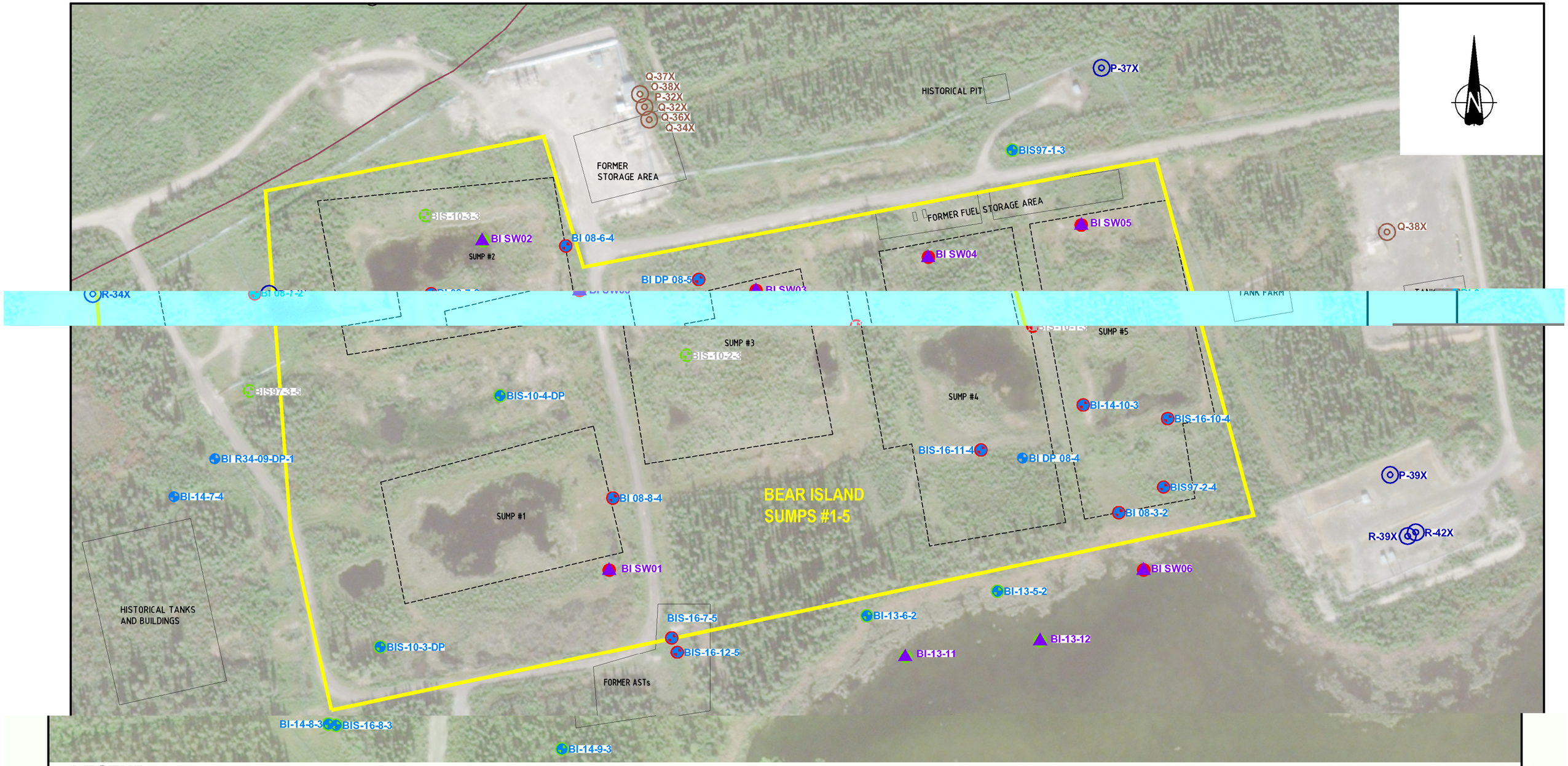
WorleyParsons Project No.
407011-00622-400

FIG No: 6D
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 8:56:58 AM
SAVE DATE & TIME: 15/5/2018 8:47:06 AM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

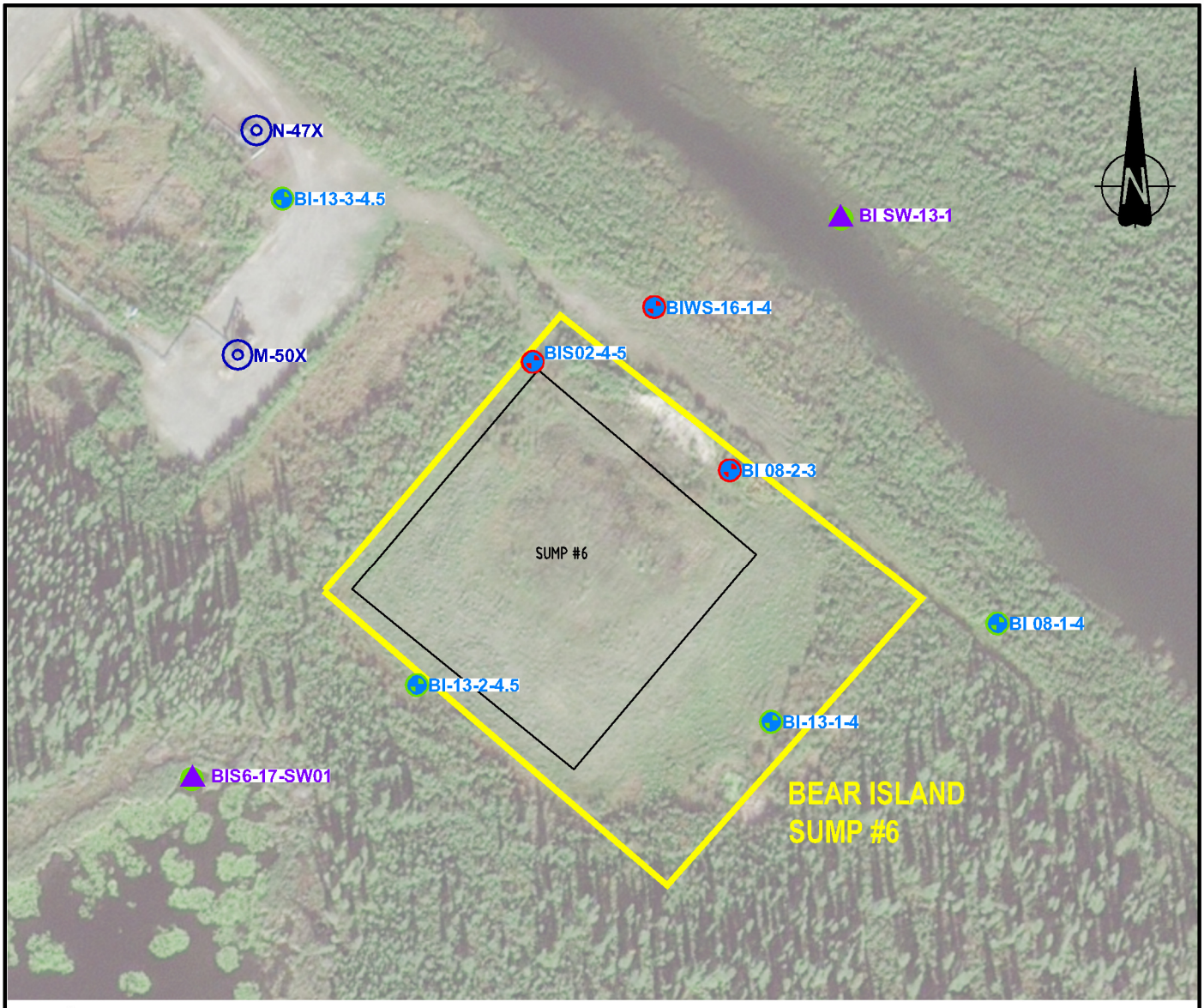
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: INORGANIC PARAMETERS (SUMPS 1-5)

Date: 25-APR-18	Drawn by: OTHERS	Edited by: B.M.F.	App'd by: MB
Advisian WorleyParsons Group		WorleyParsons Project No. 407011-00622-400	
		FIG No 7A	REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 15/5/2018 8:51:05 AM USER NAME: bbarfink
SAVE DATE & TIME: 15/5/2018 8:47:06 AM ISSUING OFFICE: CALGARY



LEGEND

- INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: INORGANIC PARAMETERS (SUMP 6)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

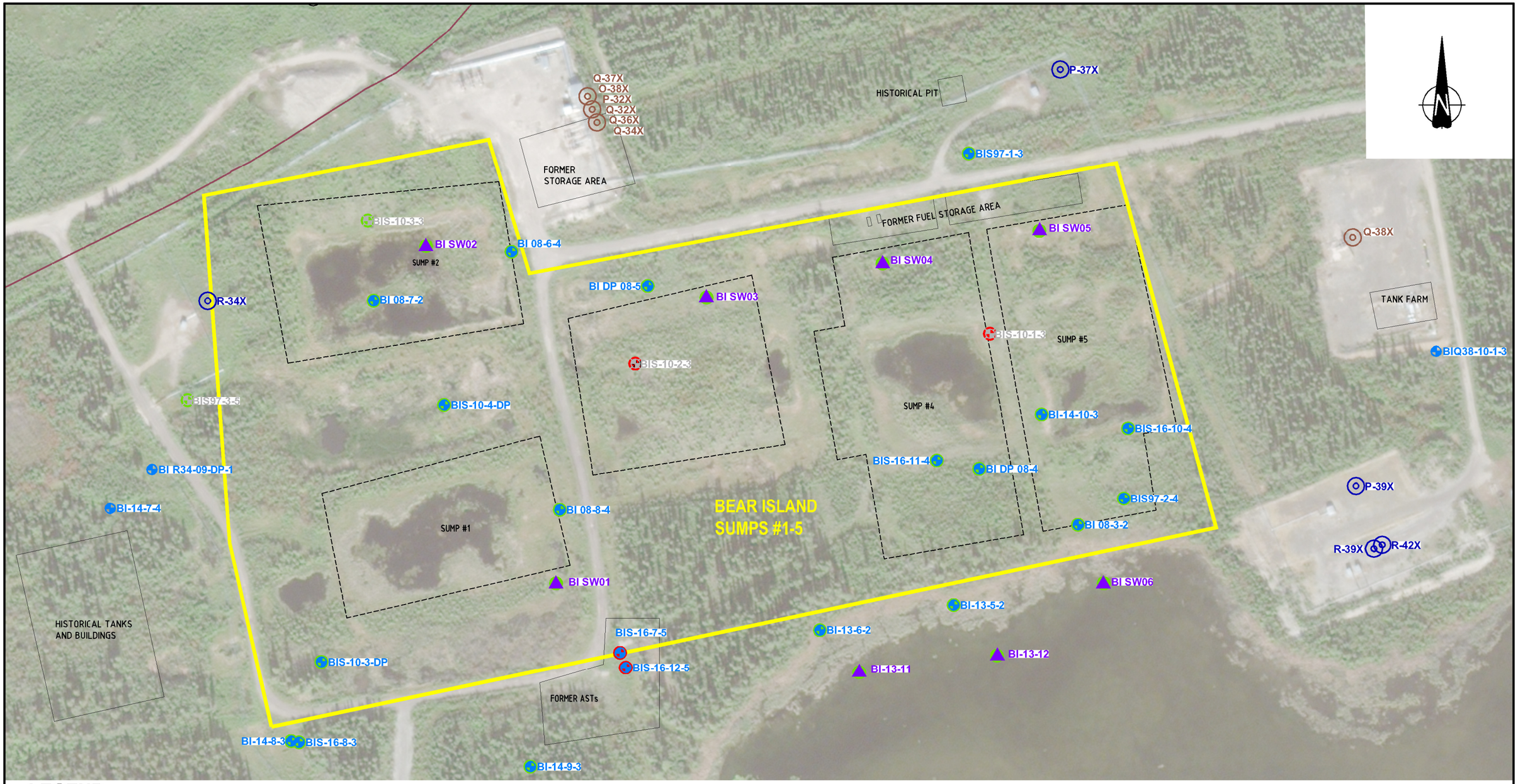
WorleyParsons Project No.
407011-00622-400

FIG No: 7B
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 8:57:59 AM
SAVE DATE & TIME: 15/5/2018 8:47:06 AM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- INJECTION WELL LOCATION
- PRODUCTION WELL LOCATION
- PIPELINE
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 — 50 — 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: ORGANIC PARAMETERS (SUMPS 1-5)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	OTHERS	B.M.F.	M.B.

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622-400

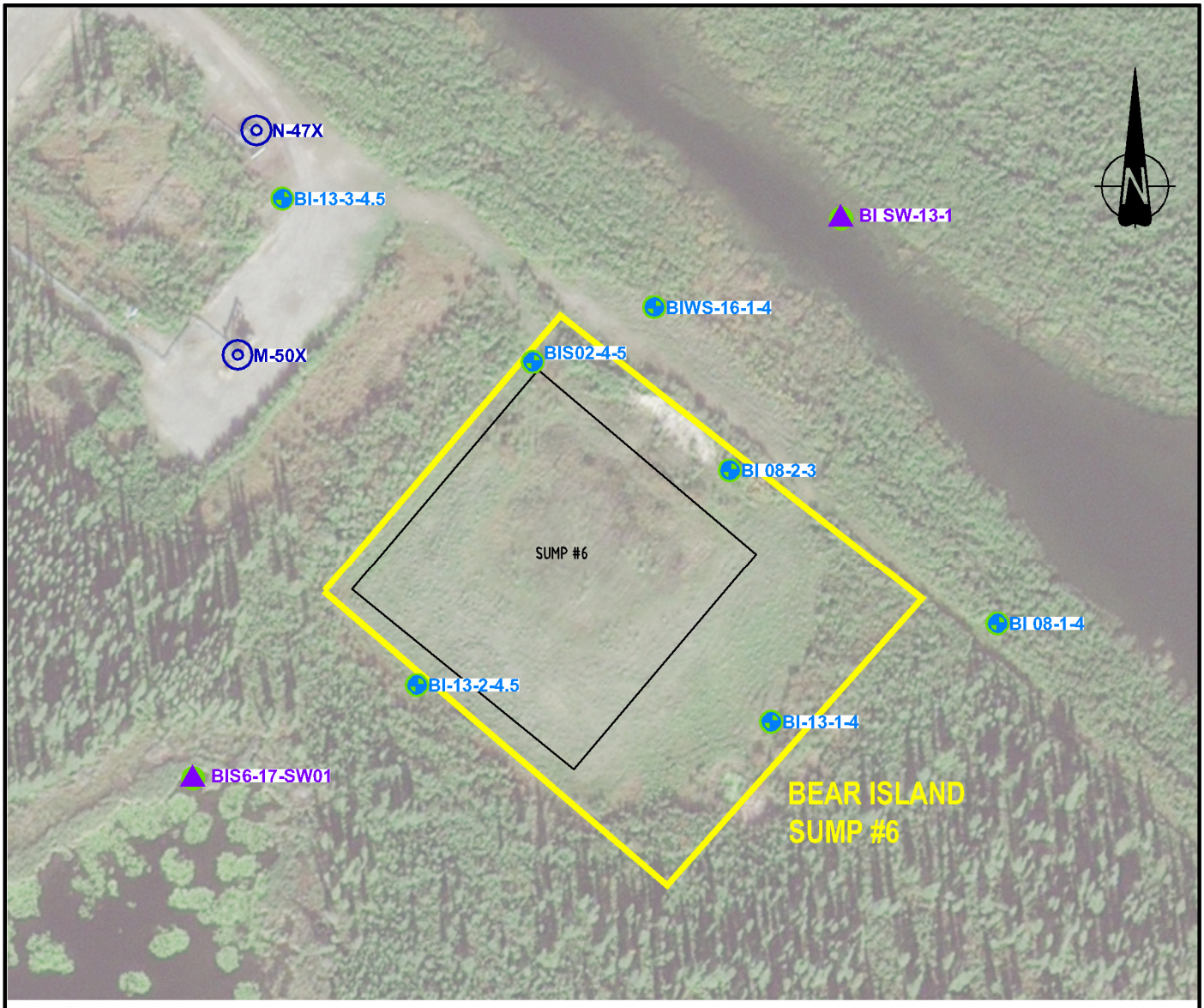
FIG No: 7C

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 15/5/2018 8:57:15 AM
SAVE DATE & TIME: 15/5/2018 8:47:08 AM
USER NAME: blair.fex
ISSUING OFFICE: CALGARY



LEGEND

- INJECTION WELL LOCATION
- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 50 100 m

1:2000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: ORGANIC PARAMETERS (SUMP 6)

Date:	Drawn by:	Edited by:	App'd by:
25-APR-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

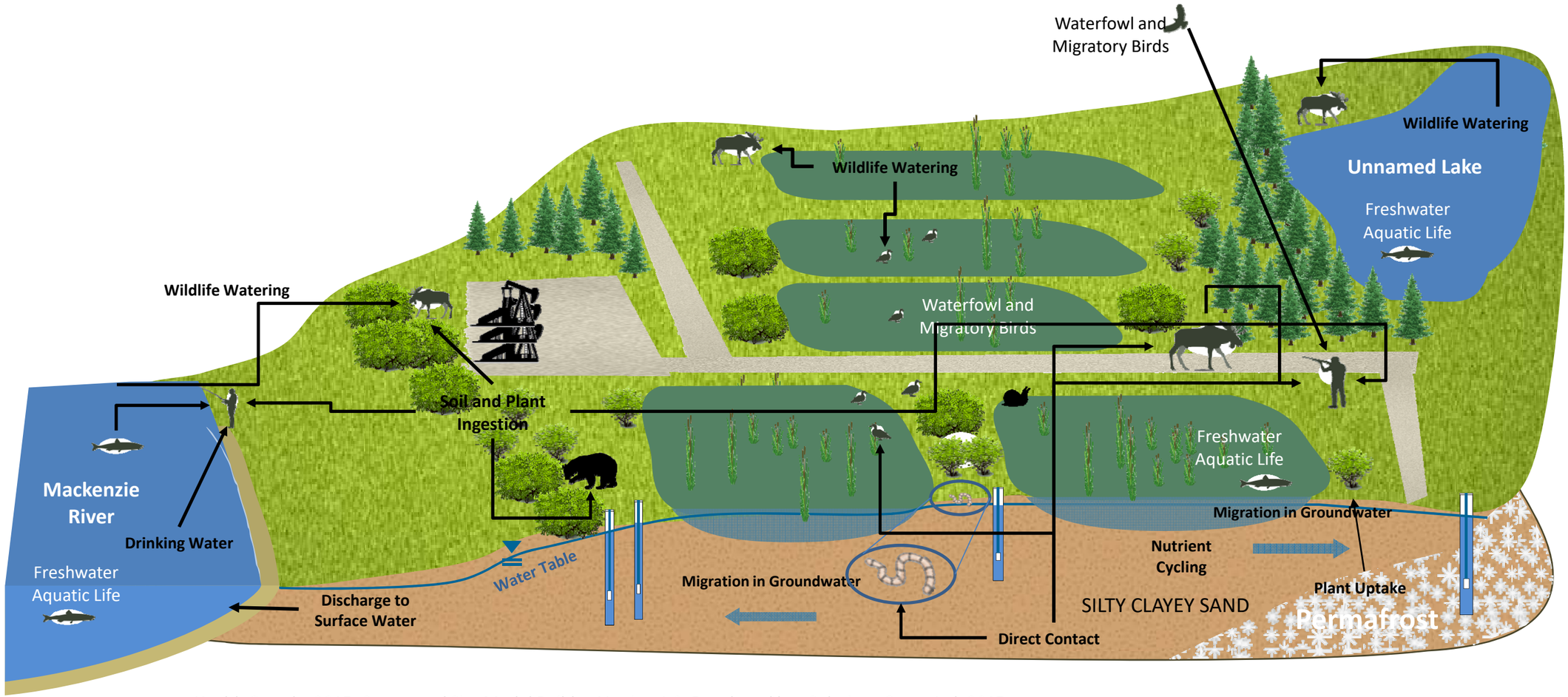
WorleyParsons Project No.
407011-00622-400

FIG No: 7D
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 8:58:53 AM
SAVE DATE & TIME: 15/5/2018 8:47:06 AM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



Health Canada, 2015. Conceptual Site Model Builder, Version 1.0. Developed by eSolutions Group Ltd. 2015.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS 1-5

Date:	Drawn by:	Edited by:	App'd by:
17-May-18	AH	LG	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

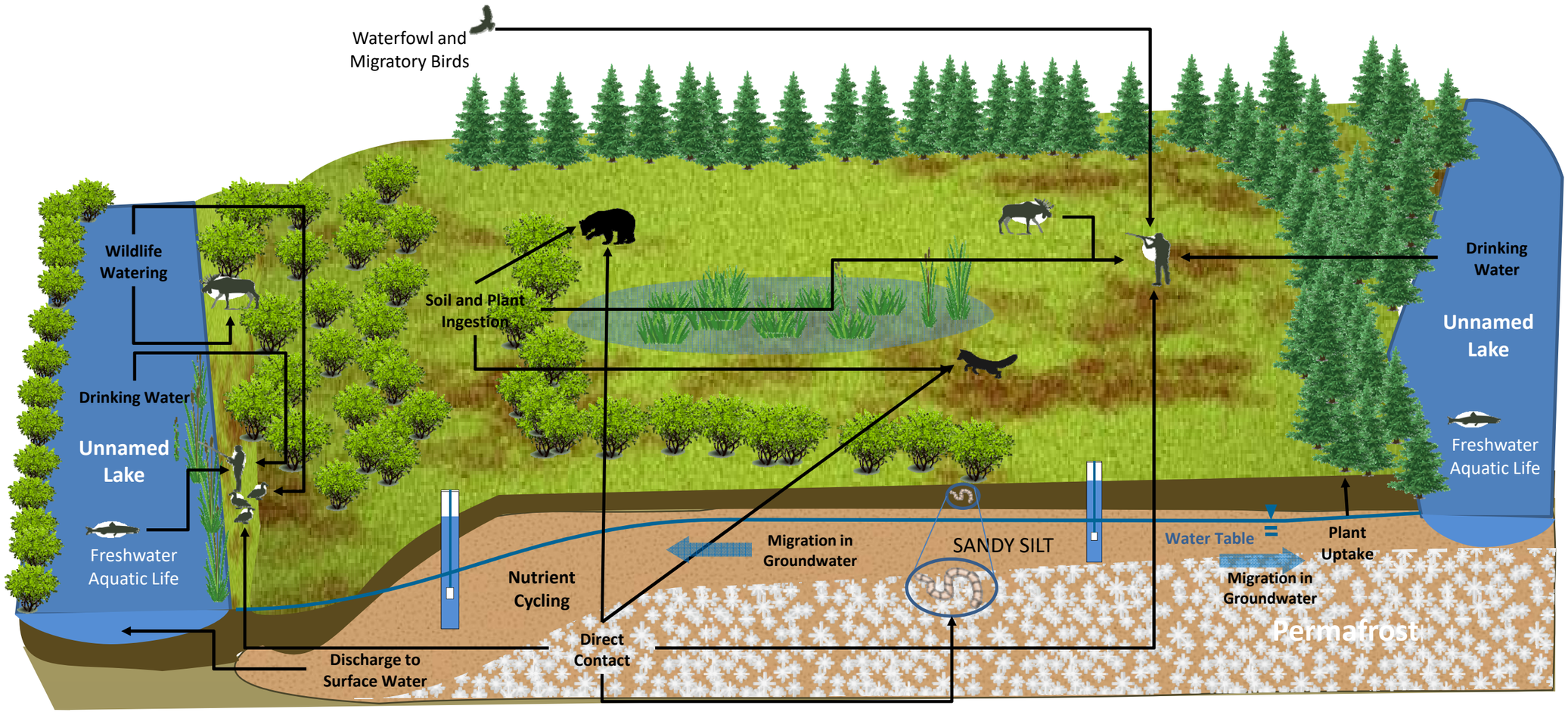
WorleyParsons Project No.
407011-00622

FIG No. 8A | REV A

* This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALIGBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS



Health Canada, 2015. Conceptual Site Model Builder, Version 1.0. Developed by eSolutions Group Ltd. 2015.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL
BEAR ISLAND SUMP 6

Date:	Drawn by:	Edited by:	App'd by:
17-May-18	AH	LG	MB

OneWay to zero harm

Advision
WorleyParsons Group

WorleyParsons Project No.
407011-00622

FIG No. 8B

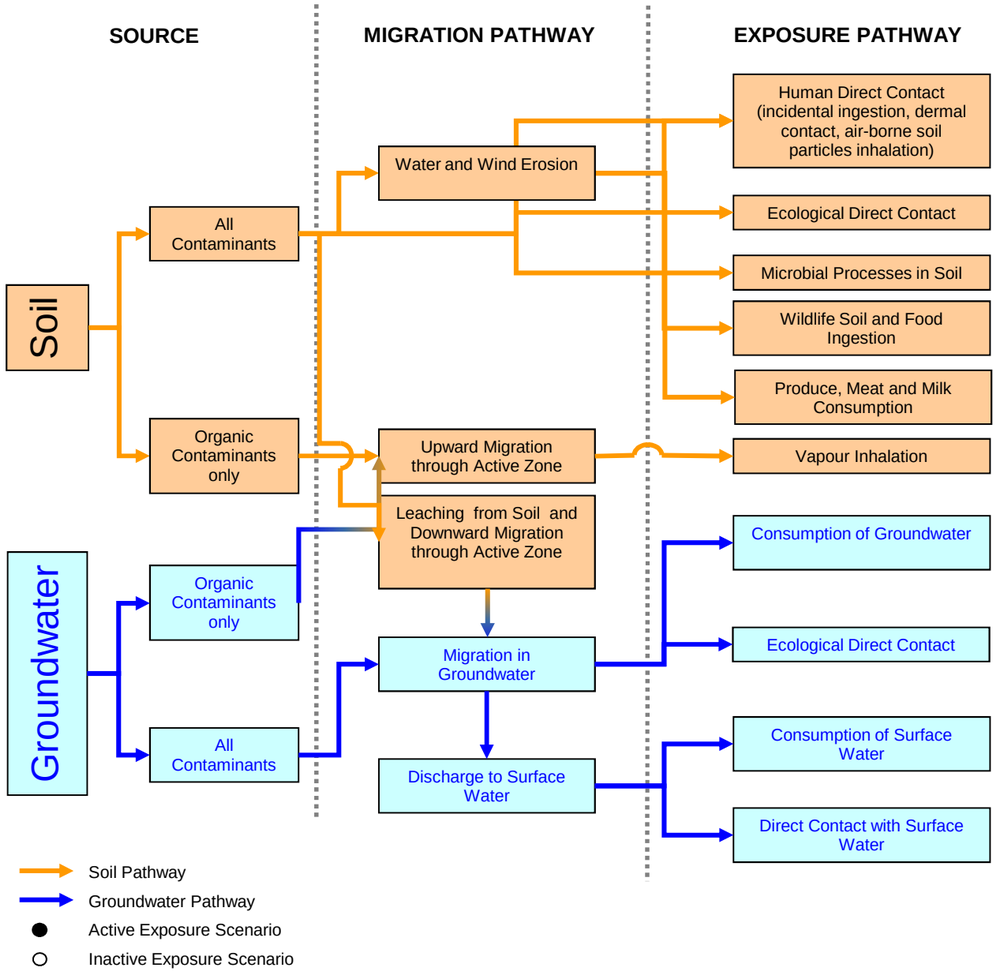
REV A

* This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS

Bear Island Sumps - Conceptual Exposure Model Flow Chart (Current Land Use and Site Conditions)



	RECEPTORS			
	Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
Human Direct Contact (incidental ingestion, dermal contact, air-borne soil particles inhalation)	●			
Ecological Direct Contact			●	
Microbial Processes in Soil			●	
Wildlife Soil and Food Ingestion		●		
Produce, Meat and Milk Consumption	●[1]			
Vapour Inhalation	○			
Consumption of Groundwater				
Ecological Direct Contact			●	
Consumption of Surface Water	○	●		
Direct Contact with Surface Water				●

Notes: 1) Although the current land use is industrial, it is recognized that due to the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site, and hunters are able to hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND SUMPS, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AH	LG	MB

OneWay™ to zero harm

Advisian WorleyParsons Group

WorleyParsons Project No. 407011-00622

FIG No. 9 REV A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY
FILE DIRECTORY: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIS

Tables



Advisian
WorleyParsons Group

Table 1A

Soil Analytical Results Sumps 1-5: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Barium - Extractable (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface #1			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**50**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Coarse Sub-Surface #2			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**50**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
Sumps 1-5																										
BI-08-04	18-Aug-2008	0.0 - 0.15m	**2.2** #1	1.8	---	< 1	8	300	---	0.4	0.5	16	< 0.15	8	18	9	0.05	2.0	25	0.9	< 1	0.5	< 1	---	24	80
	18-Aug-2008	0.15 - 0.3m	**2.1** #1	2.0	---	< 1	9	340	---	0.5	0.5	19	< 0.15	9	20	10	< 0.05	2.2	28	0.6	< 1	< 0.3	< 1	---	29	90
	25-Jul-2008	1.0 - 1.7m	1.2	0.5	---	< 1	11	410	---	< 0.4	0.8	19	< 0.15	11	25	13	0.06	3.2	35	**1.1** #1	< 1	0.4	< 1	---	32	110
	25-Jul-2008	2.2 - 2.7m	**2.6** #1	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Jul-2008	3.3 - 3.7m	**2.7** #2	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI 08-5	03-Aug-2008	0.0 - 15.0m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2008	0.15 - 0.3m	**2.4** #1	1.6	---	< 1	8	270	---	0.5	0.5	14	< 0.15	8	18	9	0.05	1.7	25	0.7	< 1	< 0.3	< 1	---	23	87
	03-Aug-2008	0.3 - 0.6m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2008	1.0 - 1.3m	**3.9** #1	4.4	---	< 1	7	190	---	< 0.4	0.5	10	< 0.15	6	11	7	< 0.05	1.5	17	0.6	< 1	< 0.3	< 1	---	15	60
BI-08-09	18-Aug-2008	0.0 - 0.15m	1.5	1.2	---	< 1	9	330	---	0.7	0.7	19	< 0.15	10	21	12	0.09	2.3	30	0.7	< 1	0.4	< 1	---	29	110
	18-Aug-2008	0.15 - 0.3m	1.1	1.4	---	< 1	8	320	---	0.5	0.6	16	< 0.15	8	18	10	0.08	2.1	27	0.9	< 1	0.5	< 1	---	26	89
BI-08-11	27-Jul-2008	0.0 - 0.3m	**4.3** #1	**5.3** #1	---	< 1	10	350	---	< 0.4	0.7	19	< 0.15	10	23	13	0.06	2.0	32	1.0	< 1	< 0.3	< 1	---	31	120
	27-Jul-2008	0.9 - 1.3m	**7.3** #1	**12** #1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	27-Jul-2008	1.9 - 2.1m	**7.4** #1	**19** #1	---	< 1	**15** #1	490	16	< 0.4	0.5	29	< 0.15	10	21	30	0.06	1.7	32	0.6	< 1	< 0.3	< 1	---	32	150
	27-Jul-2008	3.3 - 3.8m	**7.5** #2	**6.7** #1	---	< 1	8	310	---	< 0.4	0.6	13	< 0.15	8	15	9	< 0.05	1.4	24	0.8	< 1	< 0.3	< 1	---	19	79
BI-08-6	26-Jul-2008	0.9 - 1.2m	**3.6** #1	1.9	---	< 1	10	360	---	< 0.4	0.7	16	< 0.15	10	22	11	0.06	2.1	29	**1.0** #1	< 1	< 0.3	< 1	---	27	100
BI-08-7	26-Jul-2008	0.0 - 0.3m	**3.6** #1	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Jul-2008	0.9 - 1.2m	**2.9** #1	1.4	---	< 1	9	300	---	< 0.4	0.6	18	< 0.15	8	19	10	0.06	1.8	27	0.8	< 1	< 0.3	< 1	---	23	90
BI-08-8	26-Jul-2008	0.0 - 0.3m	1.4	0.9	---	< 1	9	350	---	< 0.4	0.7	17	< 0.15	9	20	11	0.06	1.9	28	0.9	< 1	< 0.3	< 1	---	26	100
	26-Jul-2008	0.9 - 1.2m	0.85	0.6	---	< 1	10	410	---	< 0.4	0.8	18	< 0.15	11	23	13	0.06	2.2	32	1.0	< 1	< 0.3	< 1	---	31	110
	26-Jul-2008	1.8 - 2.1m	0.71	1.1	---	< 1	12	390	---	< 0.4	0.7	18	< 0.15	12	25	14	0.06	2.4	35	1.1	< 1	< 0.3	< 1	---	31	120
SUMP 1	19-Oct-1998	1.0 - 2.0m	0.851	0.31	---	---	8	285	---	0.5	0.6	11.9	< 0.25	7.7	16.8	9	0.05	0.8	21.9	0.4	---	< 0.5	---	---	19.4	82.2
SUMP 2	19-Oct-1998	1.0 - 2.0m	**3.46** #1	**8.76** #1	---	---	7.4	234	---	0.4	0.8	10.4	< 0.25	6.8	16.2	7	< 0.05	0.9	20.1	0.6	---	< 0.5	---	---	17.9	78.2
BI-13-5	03-Sep-2013	0.1 - 0.5m	0.79	1.3	7.30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-2013	1.1 - 1.5m	1.7	0.38	7.19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-2013	2.6 - 3.0m	**2.4** #1	0.44	7.36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-13-6	03-Sep-2013	1.0 - 1.4m	1.6	0.48	7.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Sep-2013	1.0 - 1.4m	2.0 #1	0.47	6.86	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-2013	2.5 - 2.9m	2.0 #1	0.54	7.44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-2013	3.5 - 4.0m	**2.6** #2	0.34	7.51	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-14-8	25-Feb-2014	0.2m	0.82	0.40	6.80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Feb-2014	1.0m	1.7	0.36	6.73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Feb-2014	2.0m	**2.4** #1	0.66	7.06	< 1.0	7.9	300	---	0.55	0.50	16	< 0.15	8.4	18	9.4	< 0.050	1.9	26	0.67	< 1.0	< 0.30	< 1.0	< 1.0	28	83
	25-Feb-2014	3.0m	1.9	0.46	7.22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-14-9	23-Feb-2014	0.2m	0.37	0.22	6.91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Feb-2014	1.0m	1.6	0.56	7.33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Feb-2014	2.0m	1.3	0.33	7.09	< 1.0	9.1	320	---	0.45	0.60	16	< 0.15	8.9	19	10	< 0.050	2.2	27	0.65	< 1.0	< 0.30	< 1.0	1.1	28	94
	23-Feb-2014	3.3m	0.66	0.55	6.90	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-14-10	23-Feb-2014	1.0m	1.8	4.3	6.69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Feb-2014	2.0m	1.9	4.1	6.54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Feb-2014	3.0m	**3.5** #2	2.1	6.88	< 1.0	7.5	310	---	0.45	0.50	14	< 0.15	7.4	16	8.8	< 0.050	1.9	23	0.64	< 1.0	< 0.30	< 1.0	< 1.0	25	77
	23-Feb-2014	4.0m	**3.9** #2	1.9	6.97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI97-3	09-Aug-1997	2.3 - 3.8m	**3.54** #1	**8.8** #1	---	---	9.5	333	---	1.0	< 0.2	35.5	< 0.25	19.5	36.6	29	0.30	< 0.4	**60.7** #1	0.7	---	< 2 #1	---	---	41.8	146
BI97-4	09-Aug-1997	0.8 - 2.3m	1.58	---	---	---	7.9	332	---	0.6	< 0.2	15.5	< 0.25	9.6	18.5	16	0.13	0.6	29.0	0.8	---	< 2 #1	---	---	24.0	98.4
BIS-10-1	01-Sep-2010	0.0 - 0.3m	1.9	0.8	---	< 2	6	220	---	< 0.8	0.5	13	< 0.15	7	16	10	< 0.1	1.8	21	< 1	< 2	< 0.6	< 2	< 2	23	79
	01-Sep-2010	0.3 - 0.6m	1.9	0.7	---	< 1	6	240	---	< 0.4	0.4	13	< 0.15	6	13	9	< 0.05	1.4	20	0.5	< 1	< 0.3	< 1	1	22	62
	01-Sep-2010	0.6 - 0.75m	1.7	0.5	---	< 1	8	290	---	< 0.4	0.7	15	< 0.15	8	17	11	0.05	2.0	24	0.7	< 1	< 0.3	< 1	1	25	80
BIS-10-2	01-Sep-2010	0.0 - 0.3m	2.0 #1	0.3	---	< 1	7	280	---	< 0.4	0.5	15	< 0.15	8	17	10	0.05	1.9	24	0.7	< 1	< 0.3	< 1	1	25	76
	01-Sep-2010	0.3 - 0.6m	1.3	0.2	---	< 1	4	190	---	< 0.4	0.3	13	< 0.15	5	10	6	< 0.05	1.1	15	< 0.5	< 1	< 0.3	< 1	< 1	16	58
	01-Sep-2010	0.6 - 1.0m	0.88	0.2	---	< 1	5	210	---	< 0.4	0.3	12	< 0.15	6	12	8	< 0.05	1.2	18	0.5	< 1	< 0.3	< 1	< 1	20	57
BIS-10-3	27-Aug-2010	0.0 - 0.3m	**3.5** #1	1.8	---	< 1	7	260	---	< 0.4	0.5	13	< 0.15	7	15	8	< 0.05	1.9	22	0.5	< 1	< 0.3	< 1	< 1	22	65
	27-Aug-2010	1.5 - 1.8m	**3.8** #1	**41** #1	---	< 1	10	**560** #1	---	0.4	0.2	26	< 0.15	13	29	24	0.06	2.1	42	< 0.5	< 1	< 0.3	< 1	< 1	32	**240** #1
	27-Aug-2010	4.2 - 4.5m	**9.0** #2	**16** #2	---	< 1	6	320	---	< 0.4	0.4	11	< 0.15	6	16	9	< 0.05	1.8	19	< 0.5	< 1	< 0.3	< 1	< 1	19	60
BIS-10-4	25-Aug-2010	0.0 - 0.5m	**2.7** #1	1.5	---	< 1	5	240	---	< 0.4	0.3	12	< 0.15	6	11	7	< 0.05	1.3	17	< 0.5	< 1	< 0.3	< 1	< 1	21	49
	25-Aug-2010	1.5 - 2.0m	**5.3** #1	**5.9** #1	---	1	10	**740** #1	---	0.4	0.4	32	< 0.15	13	30	130	0.09	2.7	38	0.6	< 1	0.3	< 1	1	33	**220** #1
	25-Aug-2010	4.0 - 4.5m	**6.5** #2	**22** #2	---	1	11	**870** #2	---	0.4	0.4	35	< 0.15	12	29	**160** #2	0.12	2.3	39	< 0.5	< 1	< 0.3	< 1	1	33	**250** #2
BIS-10-5	26-Aug-2010	0.0 - 0.5m	**3.7** #1	3.0	---	< 1	7	290	---	< 0.4	0.5	16	< 0.15	9	17	11	< 0.05	2.3	26	0.6	< 1	< 0.3	< 1	< 1	28	74
	26-Aug-2010	1.5 - 2.0m	**4.0** #1	3.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIS-10-6	26-Aug-2010	0.0 - 0.3m	**4.1** #1	**6.0** #1	---	< 1	8	310	---	< 0.4	0.6	17	< 0.15	9	17	12	< 0.05	2.2	26	0.7	< 1	< 0.3	< 1	1	29	76
	26-Aug-2010	1.2 - 1.5m	**3.1** #1	**56** #1	---	< 1	**13** #1	**910** #1	---	0.5	0.2	36	< 0.15	17	34	45	0.07	2.8	**52** #1	< 0.5	< 1	0.3	< 1	< 1	44	160
	26-Aug-2010	3.8 - 4.1m	**2.6** #2	**42** #2	---	< 1	12 #2	450	---	< 0.4	0.3	25	< 0.15	12	34	45	0.08	7.8	45	**1.4** #2	< 1	0.8	< 1	1	39	140
	26-Aug-2010	5.6 - 5.9m	1.6	1.7	---	< 1	6	300	---	< 0.4	0.4	12	< 0.15	7	49	11	0.06	2.0	28	< 0.5	< 1	< 0.3	< 1	< 1	23	86
BIS-10-7	28-Aug-2010	0.0 - 0.5m	**3.2** #1	1.6	---	< 1	8	320	---	< 0.4	0.5	14	< 0.15	8	19	9	< 0.05	2.3	22	0.7	< 1	< 0.3	< 1	< 1	26	78
	28-Aug-2010	3.0 - 3.5m	**2.7** #2	0.5	---	< 1	7	250	---	< 0.4	0.5	12	< 0.15	7	14	8	0.06	1.9	21	0.6	< 1	< 0.3	< 1	< 1	21	66
	28-Aug-2010	5.3 - 5.59m	1.0	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIS-15-1	26-Sep-2015	1.2m	1.8	0.96	6.75	0.61	7.3	310	---	0.45	0.52	14	< 0.080	7.9	19	9.5	0.073	2.2	25	0.72	< 0.20	0.15	< 1.0	1.1	24	80
	26-Sep-2015	3.0m	**2.9** #1	0.39	6.73	0.59	7.9	290	---	0.41	0.53	14	< 0.080	7.9	18	9.2	0.053	2.0	24	0.67	< 0.20	0.14	< 1.0	0.95	22	81
	26-Sep-2015	4.8m	**2.4** #2	0.42	7.11	< 0.50	5.9	160	---	< 0.40	0.38	9.5	< 0.080	6.0	11	6.1	< 0.050	1.5	17	< 0.50	< 0.20	< 0.10	< 1.0	0.80	17	58
BIS-15-10	28-Sep-2015	0.6m	1.6	0.53	7.09	0.62	8.7	320	---	0.55	0.81	18	< 0.080	9.4	23	11	< 0.050	2.2	30	0.78	< 0.20	0.19	< 1.0	1.1	30	110
	28-Sep-2015	1.8m	1.7	0.43	7.00	0.62	8.7	320	---	0.52	0.49	16	< 0.080	9.3	20	10	< 0.050	2.1	28	0.69	< 0.20	0.15	< 1.0	1.0	27	89
BIS-15-11	28-Sep-2015	1.2m	**3.1** #1	0.50	7.02	0.72	9.5	340	---	0.62	0.60	18	< 0.080	10	22	12	0.052	2.2	31	0.88	< 0.20	0.19	< 1.0	1.1	31	100
	28-Sep-2015	2.4m	**2.5** #1	0.52	7.03	< 0.50	7.0	260	---	< 0.40	0.44	13	< 0.080	7.6	16	8.2	< 0.050	1.6	22	0.60	< 0.20	0.12	< 1.0	0.81	21	73
	28-Sep-2015	3.6m	**2.7** #2	0.54	7.43	0.55	6.9	240	---	< 0.40	0.48	13	< 0.080	7.2	15	7.6	< 0.050	1.7	22	0.56	< 0.20	0.11	< 1.0	0.92	21	71
BIS-15-12	28-Sep-2015	1.2m	**2.5** #1	0.39	7.07	0.58	8.2	320	---	0.42	0.57	16	< 0.080	8.5	19	9.3	< 0.050	1.9	26	0.66	< 0.20	0.15	< 1.0	1.0	26	88
	28-Sep-2015	2.4m	**2.8** #1	0.47	6.80	0.66	9.4	330	---	0.61	0.59	18	< 0.080	10	22	11	0.052	2.1	30	0.75	< 0.20	0.16	< 1.0	1.0	29	98
	28-Sep-2015	3.6m	**2.9** #2	0.56	7.03	0.66	8.4	330	---	0.45	0.54	15	< 0.080	8.8	19	9.7	< 0.050	2.2	26	0.66	< 0.20	0.15	< 1.0	0.95	26	89
BIS-15-13	28-Sep-2015	1.2m	1.1	0.33	7.25	0.59	7.9	350	---	0.41	0.54	14	< 0.080	7.8	18	8.8	< 0.050	1.8	24	0.66	< 0.20	0.15	< 1.0	0.91	25	82
	28-Sep-2015	3.0m	1.9	0.34	6.81	0.65	9.6	350	---	0.48	0.64	16	< 0.080	9.8	21	10	0.055	2.1	29	0.76	< 0.20	0.16	< 1.0	1.0	28	98
	28-Sep-2015	4.8m	**3.0** #2	0.38	6.96	0.60	7.5	210	---	< 0.40	0.56	12	< 0.080	7.3	16	7.8	< 0.050	1.9	22	0.57	< 0.20	0.12	< 1.0	0.91	22	77
BIS-15-14	28-Sep-2015	1.8m	0.81	0.51	6.62	0.62	9.0	320	---	0.53	0.59	17	< 0.080	9.7	21	10	0.063	2.2	29	0.73	< 0.20	0.16	< 1.0	0.95	28	93
	28-Sep-2015	3.0m	0.85	0.55	6.67	0.76	10	350	---	0.57	0.73	17	< 0.080	10	22	11	0.057	2.3	30	0.79	< 0.20	0.17	< 1.0	1.0	30	100
	28-Sep-2015	4.8m	**2.9** #2	0.31	6.82	0.59	7.5	240	---	< 0.40	0.56	12	< 0.080	7.3	18	8.4	< 0.050	1.8	22	0.62	< 0.20	0.13	< 1.0	1.0	21	78
BIS-15-2	26-Sep-2015	1.2m	**3.1** #1	0.32	6.82	0.60	7.8	290	---	0.43	0.49	14	< 0.080	7.8	17	9.1	< 0.050	1.8	24	0.68	< 0.20	0.15	< 1.0	0.86	23	73
	26-Sep-2015	3.0m	**2.9** #1	0.28	6.61	0.70	8.8	310	---	0.51	0.63	16	< 0.080	9.0	20	11	0.052	2.2	28	0.74	< 0.20	0.17	< 1.0	1.1	25	90
	26-Sep-2015	4.8m	**2.9** #2	0.49	6.71	0.59	7.5	280	---	0.42	0.51	13	< 0.080	7.7	16	8.8	< 0.050	1.9	23	0.62	< 0.20	0.14	< 1.0	0.90	22	77
BIS-15-3	27-Sep-2015	1.2m	1.8	0.45	6.94	0.68	9.5	330	---	0.57	0.53	17	< 0.080	10	22	11	0.080	2.4	30	0.80	< 0.20	0.17	< 1.0	1.1	30	94
	27-Sep-2015	1.8m	**2.7** #1	0.42	7.06	0.75	10	390	---	0.54	0.69	19	< 0.080	11	24	11	0.072	2.4	31	0.77	< 0.20	0.18	< 1.0	1.1	32	110
	27-Sep-2015	3.0m	1.8	0.52	7.06	0.58	7.9	290	---	< 0.40	0.51	14	< 0.080	8.0	18	8.5	0.055	1.9	23	0.62	< 0.20	0.13	< 1.0	0.88	24	80
BIS-15-4	27-Sep-2015	1.8m	1.8	3.0	6.90	0.65	9.6	340	---	0.48	0.66	17	< 0.080	9.6	21	11	0.055	2.2	29	0.77	< 0.20	0.16	< 1.0	1.0	29	99
	27-Sep-2015	3.0m	**2.6** #1	0.41	7.10	0.61	7.8	290	---	< 0.40	0.56	13	< 0.080	7.9	18	8.6	0.051	2.0	23	0.60	< 0.20	0.13	< 1.0	0.99	23	82
	27-Sep-2015	3.6m	**2.5** #2	0.43	7.37	0.59	7.4	280	---	< 0.40	0.50	12	< 0.080	7.3	17	7.9	< 0.050	1.9	22	0.55	< 0.20	0.12	< 1.0	0.90	23	75
BIS-15-5	27-Sep-2015	1.8m	1.2	0.95	6.76	0.62	9.1	300	---	0.49	0.55	15	< 0.080	9.1	19	10	0.051	2.2	27	0.69	< 0.20	0.15	< 1.0	0.91	26	89
	27-Sep-2015	3.0m	**3.7** #1	0.78	6.80	0.54	6.7	250	---	< 0.40	0.49	12	< 0.080	7.0	16	7.9	< 0.050	1.7	21	0.61	< 0.20	0.13	< 1.0	0.88	20	73
	27-Sep-2015	4.2m	**2.2** #2	0.54	7.20	0.55	6.2	200	---	< 0.40	0.42	10	< 0.080	7.0	14	6.6	< 0.050	1.7	20	< 0.50	< 0.20	< 0.10	< 1.0	0.85	20	65
BIS-15-6	27-Sep-2015	1.2m	0.99	0.82	6.62	0.65	8.3	290	---	0.54	0.58	16	< 0.080	9.4	21	11	0.099	2.5	29	0.75	< 0.20	0.19	< 1.0	1.1	28	90
	27-Sep-2015	2.4m	2.0 #1	0.40	6.78	0.68	9.4	330	---	0.54	0.61	17	< 0.080	9.9	20	11	< 0.050	2.2	29	0.73	< 0.20	0.16	< 1.0	1.1	29	95
	27-Sep-2015	3.6m	**2.5** #2	0.37	6.96	0.75	9.1	310	---	0.41	0.63	15	< 0.080	9.0	23	9.8	< 0.050	2.3	27	0.75	< 0.20	0.14	< 1.0	1.1	28	93
BIS-15-7	27-Sep-2015	1.8m	0.96	0.67	6.93	0.67	10	330	---	0.52	0.68	17	< 0.080	11	21	11	0.055	2.3	30	0.81	< 0.20	0.18	< 1.0	0.98	29	100
	27-Sep-2015	2.4m	**3.2** #1	0.58	6.95	0.62	9.2	310	---	0.48	0.54	17	< 0.080	9.5	21	10	0.052	2.2	28	0.69	< 0.20	0.16	< 1.0	1.0	28	94
	27-Sep-2015	3.0m	**2.5** #1	0.53	7.06	0.58	8.6	320	---	0.45	0.55	15	< 0.080	9.0	22	9.9	0.050	2.0	27	0.68	< 0.20	0.15	< 1.0	1.2	25	89
BIS-15-8	27-Sep-2015	1.2m	0.98	0.89	6.79	0.62	7.6	300	---	0.44	0.57	15	< 0.080	8.5	20	10	0.13	2.3	26	0.68	< 0.20	0.17	< 1.0	0.93	27	91
	27-Sep-2015	3.0m	1.6	1.6	6.86	0.68	10	340	---	0.46	0.62	17	< 0.080	9.7	21	10	0.055	2.3	28	0.73	< 0.20	0.16	< 1.0	0.98	28	96
	27-Sep-2015	4.8m	**3.0** #2	2.1	7.08	0.51	6.4	190	---	< 0.40	0.46	11	< 0.080	6.9	13	7.1	< 0.050	1.8	20	< 0.50	< 0.20	0.11	< 1.0	0.93	20	68

Advisian
WorleyParsons Group

Table 1A

Soil Analytical Results Sumps 1-5: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Barium - Extractable (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Coarse Surface #1			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**50**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Coarse Sub-Surface #2			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**50**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIS-15-9	28-Sep-2015	1.2m	1.9	0.41	6.97	0.59	9.0	260	---	0.47	0.58	16	< 0.080	9.2	19	9.1	0.057	2.0	26	0.64	< 0.20	0.16	< 1.0	0.99	27	85
	28-Sep-2015	2.4m	**2.5** #1	0.39	6.86	0.62	8.6	290	---	0.51	0.55	16	< 0.080	9.0	18	9.3	< 0.050	2.3	27	0.71	< 0.20	0.16	< 1.0	1.0	27	83
	28-Sep-2015	4.8m	2.0 #2	0.35	7.16	< 0.50	6.7	180	---	< 0.40	0.42	11	< 0.080	6.8	13	6.8	< 0.050	1.8	20	< 0.50	< 0.20	< 0.10	< 1.0	0.79	20	69
BIS-16-1	29-Feb-2016	0.5 - 0.8m	1.1	1.8	6.81	0.57	7.9	270	---	< 0.40	0.52	15	< 0.080	8.5	17	8.6	< 0.050	2.0	25	0.60	< 0.20	0.12	< 1.0	0.89	23	83
	29-Feb-2016	2.0 - 2.4m	**2.3** #1	1.6	7.24	0.62	8.4	320	---	0.45	0.59	16	< 0.080	9.0	19	9.4	0.054	2.2	27	0.68	< 0.20	0.15	< 1.0	1.1	26	91
BIS-16-2	01-Mar-2016	0.2 - 0.5m	**2.1** #1	1.5	6.75	0.79	11	320	---	0.51	0.68	15	< 0.080	10	22	12	0.053	**12** #1	35	0.99	< 0.20	0.47	< 1.0	2.2	33	94
	01-Mar-2016	1.4 - 1.7m	1.5	1.9	6.65	0.81	**12** #1	410	---	0.63	0.75	19	< 0.080	12	26	13	0.054	3.6	35	0.95	< 0.20	0.21	< 1.0	1.4	32	110
	01-Mar-2016	3.0 - 3.3m	2.0 #2	3.7	6.82	0.68	9.3	310	---	0.45	0.57	15	< 0.080	9.2	19	10	< 0.050	4.2	28	0.74	< 0.20	0.23	< 1.0	1.2	27	92
	01-Mar-2016	4.2 - 4.5m	**2.3** #2	2.2	6.75	0.57	7.2	200	---	< 0.40	0.47	12	< 0.080	7.7	13	7.8	< 0.050	2.3	22	0.50	< 0.20	0.12	< 1.0	0.92	21	72
BIS-16-3	01-Mar-2016	0.7 - 1.0m	1.4	2.5	6.72	0.76	10	**640** #1	---	0.65	0.85	20	< 0.080	11	24	14	0.068	2.8	33	0.94	< 0.20	0.21	< 1.0	1.2	33	120
	01-Mar-2016	2.0 - 2.3m	1.1	2.5	6.73	0.70	9.8	410	---	0.52	0.74	18	< 0.080	9.7	22	12	0.055	2.5	30	0.87	< 0.20	0.19	< 1.0	1.2	30	100
	01-Mar-2016	3.3 - 3.7m	1.3	3.1	6.85	0.66	8.8	380	---	0.48	0.60	16	< 0.080	8.6	19	10	0.051	2.2	27	0.70	< 0.20	0.16	< 1.0	1.0	27	90
	01-Mar-2016	4.5 - 4.8m	**3.0** #2	3.1	7.10	0.54	7.8	220	---	< 0.40	0.53	13	< 0.080	8.0	16	8.4	< 0.050	2.1	24	0.53	< 0.20	0.12	< 1.0	0.89	22	80
BIS-16-4	29-Feb-2016	1.5 - 1.8m	**3.1** #1	**8.2** #1	6.96	0.68	9.7	360	---	0.55	0.62	18	< 0.080	10	21	12	0.056	2.3	30	0.76	< 0.20	0.17	< 1.0	1.1	30	100
	29-Feb-2016	2.7 - 3.0m	**3.9** #1	3.1	7.10	0.62	8.6	310	---	0.43	0.59	16	< 0.080	8.7	19	9.4	< 0.050	2.2	27	0.63	< 0.20	0.14	< 1.0	0.96	26	90
	29-Feb-2016	3.5 - 3.8m	**3.8** #2	**5.1** #2	6.79	0.67	9.4	330	---	0.47	0.64	17	< 0.080	9.5	21	10	0.052	2.3	29	0.73	< 0.20	0.16	< 1.0	0.98	27	96
BIS-16-5	02-Mar-2016	1.6 - 1.8m	0.55	0.39	6.49	0.61	7.9	360	---	0.49	0.65	16	< 0.080	8.8	19	9.7	0.064	2.1	27	0.75	< 0.20	0.18	< 1.0	1.0	27	92
	02-Mar-2016	3.0 - 3.3m	0.31	0.57	6.83	1.1	9.2	310	---	0.47	0.60	16	< 0.080	9.3	20	9.9	< 0.050	2.3	28	0.69	< 0.20	0.16	< 1.0	1.0	26	93
	02-Mar-2016	4.3 - 4.6m	0.29	0.64	6.94	0.55	7.8	230	---	< 0.40	0.49	13	< 0.080	7.3	14	8.0	< 0.050	2.0	23	0.59	< 0.20	0.11	< 1.0	0.92	23	74
BIS-16-6	02-Mar-2016	0.1 - 0.4m	1.3	0.83	6.45	0.52	7.0	290	---	0.48	0.46	15	< 0.080	7.3	16	8.7	< 0.050	1.6	23	0.61	< 0.20	0.13	< 1.0	0.81	25	80
	02-Mar-2016	2.8 - 3.1m	**2.7** #1	0.41	6.84	0.60	8.4	290	---	0.41	0.57	15	< 0.080	8.1	17	9.3	< 0.050	2.1	25	0.69	< 0.20	0.15	< 1.0	0.97	25	85
	02-Mar-2016	4.2 - 4.5m	**2.1** #2	0.43	7.07	0.57	7.0	230	---	< 0.40	0.50	14	< 0.080	7.3	14	7.6	< 0.050	1.9	22	0.57	< 0.20	0.12	< 1.0	0.92	22	70
BIS-16-7	02-Mar-2016	0.2 - 0.5m	1.7	0.66	6.89	0.61	9.5	370	---	0.57	0.59	18	< 0.080	9.4	21	13	< 0.050	2.3	29	0.81	< 0.20	0.17	< 1.0	1.0	29	97
	02-Mar-2016	2.5 - 2.7m	2.0 #1	0.83	6.86	0.60	8.1	320	---	0.46	0.57	16	< 0.080	8.1	17	9.7	< 0.050	2.1	25	0.66	< 0.20	0.15	< 1.0	1.1	27	86
	02-Mar-2016	4.4 - 4.7m	1.6	2.1	7.04	0.54	6.9	210	---	< 0.40	0.43	12	< 0.080	6.9	12	7.3	< 0.050	1.8	21	0.50	< 0.20	0.11	< 1.0	0.89	22	68
BIS-16-8	02-Mar-2016	0.1 - 0.4m	1.2	0.38	7.16	0.69	9.7	370	---	0.62	0.61	19	< 0.080	9.9	23	12	0.050	2.3	31	0.86	< 0.20	0.19	< 1.0	1.0	31	110
	02-Mar-2016	1.8 - 2.1m	**2.4** #1	0.50	7.08	0.61	8.3	340	---	0.45	0.57	16	< 0.080	8.3	17	9.2	< 0.050	2.2	25	0.70	< 0.20	0.15	< 1.0	0.95	26	86
BIS-16-9	03-Mar-2016	1.2 - 1.4m	1.1	0.63	6.80	0.70	10	360	---	0.56	0.67	19	< 0.080	11	23	11	0.068	2.5	33	0.80	< 0.20	0.19	< 1.0	1.2	32	110
	03-Mar-2016	2.6 - 2.9m	1.0	0.52	6.89	0.63	8.7	270	---	0.43	0.57	16	< 0.080	9.1	19	9.2	0.054	2.2	27	0.60	< 0.20	0.14	< 1.0	1.0	26	87
	03-Mar-2016	4.5 - 4.8m	1.6	0.54	7.15	0.59	7.7	190	---	< 0.40	0.49	14	< 0.080	8.4	14	7.8	< 0.050	2.1	24	< 0.50	< 0.20	0.11	< 1.0	1.1	24	78
BIS-16-10	03-Mar-2016	0.8 - 1.1m	0.85	1.3	7.08	0.75	10	400	---	0.59	0.79	20	< 0.080	11	24	12	0.066	2.6	33	0.79	< 0.20	0.19	< 1.0	1.4	32	120
	03-Mar-2016	2.0 - 2.3m	0.94	2.2	6.98	0.70	9.8	360	---	0.51	0.65	18	< 0.080	10	22	11	0.060	2.5	30	0.71	< 0.20	0.17	< 1.0	1.1	29	100
	03-Mar-2016	3.7 - 4.0m	**2.6** #2	2.0	7.06	0.51	6.6	180	---	< 0.40	0.42	13	< 0.080	7.1	12	6.8	< 0.050	1.7	21	< 0.50	< 0.20	< 0.10	< 1.0	0.86	21	65
BIS-16-11	03-Mar-2016	1.3 - 1.6m	**3.7** #1	4.4	7.44	0.62	8.3	290	---	0.43	0.56	17	< 0.080	8.8	18	8.9	< 0.050	2.1	27	0.58	< 0.20	0.14	< 1.0	1.0	26	85
	03-Mar-2016	2.1 - 2.4m	**2.2** #1	1.4	6.88	0.76	10	360	---	0.55	0.68	19	< 0.080	11	23	12	0.061	2.5	32	0.74	< 0.20	0.18	< 1.0	1.1	30	100
	03-Mar-2016	3.3 - 3.6m	**2.5** #2	1.0	6.94	0.69	9.5	330	---	0.51	0.68	17	< 0.080	9.8	21	10	0.053	2.4	30	0.73	< 0.20	0.17	< 1.0	1.1	29	100
BIS-16-12	04-Mar-2016	0.7 - 1.0m	1.7	2.1	6.76	0.60	9.9	320	---	0.56	0.71	17	< 0.080	10	23	14	0.054	2.3	31	0.71	< 0.20	0.19	< 1.0	1.0	27	100
	04-Mar-2016	2.4 - 2.7m	1.7	0.95	7.02	0.62	8.3	260	---	0.40	0.54	13	< 0.080	8.0	17	10	< 0.050	2.1	24	0.65	< 0.20	0.13	< 1.0	0.86	23	83
	04-Mar-2016	4.3 - 4.6m	1.4	1.8	7.02	0.56	7.3	210	---	< 0.40	0.49	13	< 0.080	7.8	14	7.7	< 0.050	2.0	23	< 0.50	< 0.20	0.11	< 1.0	0.94	22	74
BIS-16-13	09-Mar-2016	1.2 - 1.6m	1.5	2.5	6.76	0.68	10	350	---	0.53	0.63	16	< 0.080	11	23	13	0.13	2.5	31	0.70	< 0.20	0.17	< 1.0	0.99	26	100
	09-Mar-2016	3.0 - 3.5m	1.2	0.79	6.83	0.65	8.2	290	---	0.40	0.61	12	< 0.080	8.2	18	9.3	0.11	2.2	24	0.63	< 0.20	0.14	< 1.0	0.98	21	86
	09-Mar-2016	4.2 - 4.8m	**2.4** #2	3.0	7.06	0.59	7.0	180	---	< 0.40	0.50	11	< 0.080	7.2	13	7.4	0.088	2.1	21	< 0.50	< 0.20	0.11	< 1.0	0.89	19	73
BIS-TH16-1	04-Mar-2016	0.8 - 1.1m	1.9	1.7	7.11	0.72	9.7	360	---	0.56	0.71	17	< 0.080	9.9	23	11	0.060	2.3	31	0.85	< 0.20	0.18	< 1.0	1.0	27	98
	04-Mar-2016	2.1 - 2.4m	**2.7** #1	0.69	7.09	0.63	8.7	300	---	0.45	0.59	15	< 0.080	8.7	19	10	0.052	2.2	27	0.71	< 0.20	0.15	< 1.0	0.98	24	91
	04-Mar-2016	4.5 - 4.8m	**3.2** #2	1.0	7.32	0.53	6.8	220	---	< 0.40	0.42	13	< 0.080	7.2	13	7.3	< 0.050	1.8	21	0.50	< 0.20	< 0.10	< 1.0	0.83	20	70
BIS05-01	30-Aug-2005	0.0 - 0.3m	**3.04** #1	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	0.3 - 0.6m	**2.04** #1	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	1.0 - 1.3m	**2.32** #1	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	2.0 - 2.2m	**2.86** #1	0.4	---	---	6	290	---	0.2	0.8	13	< 0.3	10.1	18	11	< 0.05	1.7	29	< 0.5	---	< 1	---	---	25	78
BIS05-02	30-Aug-2005	1.0 - 1.2m	**8.94** #1	**19.3** #1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	1.3 - 1.5m	**17.2** #1	**36.1** #1	---	---	**15** #1	**891** #1	71	0.2	0.4	18	< 0.3	7.8	18	22	0.07	1.7	25	< 0.5	---	< 1	---	---	27	161
	30-Aug-2005	3.0 - 3.5m	**4.05** #2	4.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIS05-03	30-Aug-2005	0.0 - 0.5m	**4.36** #1	3.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Aug-2005	0.5 - 1.0m	**4.57** #1	**6.6** #1	---	---	6	291	---	0.2	0.5	13	< 0.3	10.1	19	11	< 0.05	1.8	30	< 0.5	---	< 1	---	---	24	78
	30-Aug-2005	1.5 - 2.0m	**4.41** #1	**9.3** #1	---	---	7	303	---	0.2	0.5	15	< 0.3	8.7	18	12	< 0.05	1.7	27	< 0.5	---	< 1	---	---	28	82
BI-14-7	24-Feb-2014	1.0m	1.2	0.47	6.89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Feb-2014	2.0m	**2.4** #1	0.45	6.94	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Feb-2014	3.0m	1.7	0.44	6.94	< 1.0	8.2	310	---	0.53	0.51	15	< 0.15	8.5	18	9.6	< 0.050	1.9	26	0.68	< 1.0	< 0.30	< 1.0	< 1.0	27	83
(Duplicate)	24-Feb-2014	3.0m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Feb-2014	3.9m	1.5	0.34	7.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-R34-09-1	29-Aug-2009	0.0 - 0.3m	0.62	0.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Aug-2009	0.3 - 0.6m	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIBG16-12	03-Mar-2016	1.0 - 1.3m	**2.5** #1	0.41	7.08	0.70	9.9	370	---	0.57	0.63	18	< 0.080	10	23	11	0.053	2.4	31	0.77	< 0.20	0.17	< 1.0	1.1	30	100

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Elemental Sulphur (Calculated)
7. Chloride (Calculated)
8. Superscript #1 denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, 1999 and updates)
8. Superscript #2 denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, 1999 and updates)

Table 1B

Soil Analytical Results Sump 6: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																						
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Barium - Extractable (mg/kg)	Barium - Total Fusion (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Fine Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
Sump 6																												
BI 08-01	26-Jul-2008	0.0 - 0.3m	1.3	0.5	---	< 1	10	380	---	---	< 0.4	0.7	17	< 0.15	9	21	11	0.06	2.2	29	1.0 [#1]	< 1	0.4	< 1	---	27	100
	26-Jul-2008	0.8 - 1.2m	1.3	0.3	---	< 1	8	260	---	---	< 0.4	0.5	13	< 0.15	8	17	9	0.06	1.7	23	0.8	< 1	< 0.3	< 1	---	21	78
	26-Jul-2008	2.0 - 2.4m	1.4	0.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-08-02-03	26-Jul-2008	0.0 - 0.3m	---	---	---	< 1	7	330	---	---	< 0.4	0.5	12	< 0.15	7	16	8	0.05	1.5	21	0.7	< 1	< 0.3	< 1	---	19	74
BI-08-2	26-Jul-2008	0.0 - 0.3m	0.91	1.8	---	< 1	7	250	---	---	< 0.4	0.4	18	< 0.15	8	18	8	< 0.05	1.4	26	< 0.5	< 1	< 0.3	< 1	---	23	73
	26-Jul-2008	0.9 - 1.2m	0.76	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-08-3	26-Jul-2008	0.0 - 0.3m	---	---	---	< 1	6	230	---	---	< 0.4	0.4	14	< 0.15	6	15	7	< 0.05	1.3	21	< 0.5	< 1	< 0.3	< 1	---	21	62
	26-Jul-2008	2.0 - 2.4m	2.4 [#1]	0.4	---	< 1	10	330	---	---	< 0.4	0.8	14	< 0.15	9	21	11	0.06	2.0	27	0.9	< 1	< 0.3	< 1	---	24	94
BI-13-1	04-Sep-2013	1.1 - 1.5m	0.86	0.51	6.97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	1.8 - 2.2m	1.8	0.55	6.81	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	3.2 - 3.6m	2.5 [#2]	0.38	6.83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	5.1 - 5.5m	2.9 [#2]	0.27	7.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-13-2	04-Sep-2013	1.0 - 1.4m	1.8	0.51	6.88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	1.8 - 2.2m	1.2	0.61	7.04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	3.7 - 4.1m	0.21	0.87	6.76	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	5.2 - 5.6m	0.16	1.1	6.99	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI-13-3	04-Sep-2013	1.2 - 1.6m	0.51	0.64	6.98	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	2.0 - 2.4m	0.51	0.54	7.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	3.8 - 4.2m	2.0 [#2]	0.23	6.86	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	5.6 - 6.0m	0.83	0.63	6.92	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2013	6.7 - 7.1m	0.41	0.49	6.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIS6-17-1	26-Sep-2017	1.0 - 1.5m	1.8	0.44	7.54	0.62	8.2	330	---	---	0.46	0.55	14	< 0.080	8.4	19	9.4	---	2.0	26	0.66	< 0.20	0.16	< 1.0	0.93	25	86
	26-Sep-2017	2.0 - 2.5m	2.4 [#1]	0.42	7.35	0.60	8.0	270	---	---	< 0.40	0.60	13	< 0.080	7.5	17	8.6	---	2.1	23	0.66	< 0.20	0.14	< 1.0	0.99	23	81
BIS6-17-2	26-Sep-2017	0.0 - 0.5m	0.77	0.33	7.39	0.63	8.0	350	---	---	0.43	0.60	14	< 0.080	8.0	18	9.7	---	2.1	25	0.67	< 0.20	0.16	< 1.0	0.96	23	87
BIS6-17-3	26-Sep-2017	0.5 - 1.0m	0.82	0.36	7.47	0.69	9.1	360	---	---	0.52	0.62	16	< 0.080	11	21	10	---	2.2	28	0.71	< 0.20	0.17	< 1.0	1.0	26	89
	26-Sep-2017	1.5 - 2.0m	2.5 [#1]	0.30	7.23	0.65	8.8	320	---	---	0.48	0.65	15	< 0.080	9.0	20	9.9	---	2.1	27	0.71	< 0.20	0.16	< 1.0	1.0	25	91
BIS6-17-4	26-Sep-2017	0.0 - 0.5m	0.69	0.30	7.46	0.53	7.5	290	---	---	0.43	0.76	13	< 0.080	8.0	19	9.0	---	1.9	25	0.66	< 0.20	0.15	< 1.0	0.85	23	84
BIS6-17-5	26-Sep-2017	0.5 - 1.0m	7.0 [#1]	3.8	7.51	0.61	8.0	270	---	---	0.40	0.51	14	< 0.080	8.3	17	8.7	---	2.1	24	0.58	< 0.20	0.13	< 1.0	0.92	22	81
	26-Sep-2017	2.5 - 3.0m	4.5 [#1]	8.9 [#1]	7.62	0.72	8.7	760 [#1]	18	2000 [#1]	0.43	0.60	17	< 0.080	9.4	19	23	---	2.4	28	0.64	< 0.20	0.16	< 1.0	1.2	24	100
(Duplicate)	26-Sep-2017	2.5 - 3.0m	4.3 [#1]	9.8 [#1]	7.60	0.77	8.3	810 [#1]	21	2100 [#1]	0.46	0.61	15	< 0.080	8.5	18	21	---	2.2	26	0.63	< 0.20	0.16	< 1.0	1.1	24	99
	26-Sep-2017	3.0 - 3.5m	4.0 [#2]	10 [#2]	7.78	0.83	8.5	1000 [#2]	26	4400 [#2]	0.43	0.57	17	< 0.080	8.9	21	48	---	2.4	28	0.67	< 0.20	0.19	< 1.0	0.95	24	120
	26-Sep-2017	4.0 - 4.5m	5.4 [#2]	4.2	7.53	0.60	7.6	310	---	---	< 0.40	0.52	13	< 0.080	7.6	17	9.6	---	1.8	23	0.57	< 0.20	0.14	< 1.0	0.91	21	80
BIWS-16-1	29-Sep-2016	1.0 - 1.5m	3.1 [#1]	1.0	7.14	0.60	8.3	270	---	---	0.45	0.58	15	< 0.080	8.3	19	9.2	0.072	2.0	25	0.63	< 0.20	0.15	< 1.0	0.94	26	87
(Duplicate)	29-Sep-2016	1.0 - 1.5m	3.1 [#1]	0.98	7.08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	29-Sep-2016	2.0 - 2.5m	3.6 [#1]	2.5	6.76	0.59	8.4	310	---	---	0.45	0.58	15	< 0.080	9.0	19	9.3	0.067	2.1	27	0.69	< 0.20	0.15	< 1.0	1.1	25	90
	29-Sep-2016	4.0 - 4.5m	1.7	1.6	6.85	0.66	9.5	330	---	---	0.55	0.67	17	< 0.080	9.4	22	12	0.051	2.0	30	0.79	< 0.20	0.17	< 1.0	0.89	29	110
BIWS-16-2	29-Sep-2016	1.0 - 1.5m	2.0 [#1]	0.40	6.93	0.65	8.2	300	---	---	0.44	0.58	14	< 0.080	7.8	20	9.7	< 0.050	2.1	26	0.69	< 0.20	0.15	< 1.0	0.90	24	82
	29-Sep-2016	1.5 - 2.5m	2.7 [#1]	0.38	7.06	0.59	8.0	240	---	---	< 0.40	0.58	13	< 0.080	7.9	17	8.6	< 0.050	2.0	24	0.64	< 0.20	0.13	< 1.0	0.83	21	80
	29-Sep-2016	4.0 - 4.5m	1.1	0.41	6.80	0.64	11	320	---	---	0.50	0.57	16	< 0.080	9.8	21	11	0.051	2.2	29	0.73	< 0.20	0.16	< 1.0	0.86	26	97
BIWS-16-3	29-Sep-2016	1.0 - 1.5m	3.1 [#1]	1.5	7.20	0.59	8.0	230	---	---	< 0.40	0.53	12	< 0.080	8.1	18	8.6	0.069	2.0	24	0.60	< 0.20	0.12	< 1.0	0.97	21	79
	29-Sep-2016	2.0 - 2.5m	3.5 [#1]	1.5	7.31	0.53	7.4	190	---	---	< 0.40	0.43	10	< 0.080	6.9	13	7.5	< 0.050	1.7	20	0.51	< 0.20	0.11	< 1.0	0.74	19	68
	29-Sep-2016	3.0 - 3.5m	1.8	0.70	6.80	< 0.50	8.0	240	---	---	< 0.40	0.50	13	< 0.080	8.6	17	8.5	0.061	2.1	24	0.61	< 0.20	0.12	< 1.0	0.99	22	79
BIWS-16-4	30-Sep-2016	0.5 - 1.0m	0.58	1.4	7.50	< 0.50	6.3	230	---	---	< 0.40	0.38	17	< 0.080	7.2	20	7.4	0.063	1.5	24	< 0.50	< 0.20	< 0.10	< 1.0	0.71	23	65
	30-Sep-2016	1.0 - 1.5m	0.47	0.66	7.32	< 0.50	6.5	230	---	---	< 0.40	0.43	15	< 0.080	7.8	18	7.4	0.061	1.5	25	< 0.50	< 0.20	0.11	< 1.0	0.65	23	73
(Duplicate)	30-Sep-2016	1.0 - 1.5m	0.46	0.72	6.93	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Sep-2016	2.0 - 2.5m	2.4 [#1]	0.41	6.88	0.63	9.2	310	---	---	0.49	0.67	15	< 0.080	9.4	22	10	0.068	2.3	28	0.73	< 0.20	0.16	< 1.0	0.98	25	99

Table 1B

Soil Analytical Results Sump 6: Inorganic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Barium - Extractable (mg/kg)	Barium - Total Fusion (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Fine Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**500**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIWS-16-5	30-Sep-2016	0.5 - 1.0m	**3.5** [#1]	0.96	7.22	0.63	9.3	310	---	---	0.47	0.65	15	< 0.080	9.3	23	10	0.062	2.2	28	0.67	< 0.20	0.15	< 1.0	0.98	25	98
	30-Sep-2016	2.0 - 2.5m	**4.1** [#1]	1.5	6.79	0.70	10	340	---	---	0.51	0.76	17	< 0.080	11	24	11	0.072	2.7	32	0.86	< 0.20	0.18	< 1.0	1.2	29	110
	30-Sep-2016	3.0 - 3.5m	**6.1** [#2]	2.7	6.82	0.61	9.2	300	---	---	0.50	0.64	16	< 0.080	9.7	22	10	0.064	2.2	29	0.71	< 0.20	0.16	< 1.0	0.99	26	97
BIWS-16-6	30-Sep-2016	0.0 - 0.5m	0.76	0.99	7.33	< 0.50	6.3	210	---	---	< 0.40	0.38	16	< 0.080	7.2	17	6.9	0.050	1.5	24	< 0.50	< 0.20	< 0.10	< 1.0	0.74	22	63
	30-Sep-2016	0.5 - 1.0m	**2.9** [#1]	1.5	7.34	< 0.50	6.6	250	---	---	< 0.40	0.36	16	< 0.080	7.2	17	6.9	< 0.050	1.4	24	< 0.50	< 0.20	< 0.10	< 1.0	0.65	23	64
(Duplicate)	30-Sep-2016	0.5 - 1.0m	**2.5** [#1]	1.6	7.34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30-Sep-2016	1.5 - 2.0m	**3.7** [#1]	2.2	6.84	0.58	8.3	280	---	---	0.41	0.55	14	< 0.080	8.5	20	9.3	0.058	2.1	26	0.67	< 0.20	0.14	< 1.0	0.86	23	87
BIWS-16-7	30-Sep-2016	1.0 - 1.5m	**3.7** [#1]	0.84	7.04	0.57	8.8	290	---	---	0.44	0.61	15	< 0.080	9.0	22	9.9	0.060	2.1	27	0.65	< 0.20	0.14	< 1.0	0.98	24	89
	30-Sep-2016	1.5 - 2.0m	**3.8** [#1]	2.4	6.85	0.66	9.0	**540** [#1]	11	**2300** [#1]	0.78	0.60	15	< 0.080	9.4	22	15	0.064	2.3	28	0.71	< 0.20	0.15	< 1.0	0.96	25	99
	30-Sep-2016	2.0 - 2.5m	**5.3** [#1]	2.8	6.83	< 0.50	7.1	210	---	---	< 0.40	0.49	11	< 0.080	7.4	18	7.7	0.052	1.8	22	0.53	< 0.20	0.12	< 1.0	0.83	19	73
BIWS-16-8	30-Sep-2016	0.5 - 1.0m	0.78	3.6	7.39	< 0.50	6.4	230	---	---	< 0.40	0.43	15	< 0.080	7.1	17	7.7	< 0.050	1.5	25	< 0.50	< 0.20	< 0.10	< 1.0	0.75	24	72
	30-Sep-2016	2.0 - 2.5m	2.0 [#1]	0.79	7.07	0.65	9.2	320	---	---	0.48	0.62	15	< 0.080	8.8	21	10	< 0.050	2.2	28	0.72	< 0.20	0.15	< 1.0	0.92	25	92
	30-Sep-2016	3.0 - 3.5m	0.76	0.63	6.80	0.66	8.8	330	---	---	0.52	0.62	16	< 0.080	9.0	21	11	< 0.050	1.9	28	0.77	< 0.20	0.16	< 1.0	0.96	26	99
BIWS-16-9	30-Sep-2016	1.0 - 1.5m	**4.0** [#1]	0.83	7.09	0.62	8.5	300	---	---	0.47	0.61	14	< 0.080	8.7	19	10	< 0.050	2.0	27	0.70	< 0.20	0.14	< 1.0	0.99	24	89
	30-Sep-2016	2.0 - 2.5m	**2.9** [#1]	2.1	6.91	0.60	9.3	310	---	---	0.51	0.63	16	< 0.080	9.8	26	11	0.058	2.2	30	0.74	< 0.20	0.17	< 1.0	1.0	26	100
	30-Sep-2016	3.0 - 3.5m	1.9	0.70	6.92	0.59	8.8	290	---	---	0.46	0.58	15	< 0.080	9.3	21	9.9	0.062	2.2	28	0.69	< 0.20	0.15	< 1.0	1.0	24	92
BIWS02-1	23-Jul-2002	0.0 - 1.5m	**4.81** [#1]	4.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2002	1.5 - 3.0m	---	---	---	---	6.8	248	---	---	0.4	0.55	10.1	< 0.25	7.2	16.4	8.2	< 0.05	1.5	21.4	< 0.5	---	0.14	---	---	20	74.7
	23-Jul-2002	3.0 - 4.5m	**3.14** [#2]	0.44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIWS02-2	23-Jul-2002	0.0 - 1.5m	**4.64** [#1]	0.84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Jul-2002	1.5 - 3.0m	---	---	---	---	7.1	270	---	---	0.5	0.51	11.2	< 0.25	7.5	16.2	8.4	< 0.05	1.5	22.3	< 0.5	---	0.15	---	---	20	78.7
	23-Jul-2002	3.0 - 4.5m	**8.18** [#2]	**10.1** [#2]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Surface soils, 1999 and updates)
8. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2A

Soil Analytical Results Sumps 1-5: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)								
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000
Sumps 1-5											
BI-08-04	18-Aug-2008	0.0 - 0.15m	---	---	---	---	---	---	---	---	---
	18-Aug-2008	0.15 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	25	100	39	---
	25-Jul-2008	1.0 - 1.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	24	29	50	---
	25-Jul-2008	2.2 - 2.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	20	< 10	35	---
	25-Jul-2008	3.3 - 3.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	23	< 10	33	---
BI 08-5	03-Aug-2008	0.0 - 15.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	110	28	---
	03-Aug-2008	0.15 - 0.3m	---	---	---	---	---	---	---	---	---
	03-Aug-2008	0.3 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	97	25	---
	03-Aug-2008	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	67	16	---
BI-08-09	18-Aug-2008	0.0 - 0.15m	---	---	---	---	---	---	---	---	---
	18-Aug-2008	0.15 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	31	160	65	---
BI-08-11	27-Jul-2008	0.0 - 0.3m	0.011	< 0.020	< 0.010	< 0.040	< 12	< 10	130	42	---
	27-Jul-2008	0.9 - 1.3m	3.2 [#3]	0.089	1.2	1.0	180	630 [#3]	1600 [#3]	590	740
	27-Jul-2008	1.9 - 2.1m	9.1 [#3]	33 [#1]	10	42 [#1]	690 [#3]	5700 [#3]	16000 [#3]	7000 [#3]	17000 [#3]
	27-Jul-2008	3.3 - 3.8m	0.37	1.1 [#2]	0.48	2.2	41	180	360	130	---
BI-08-6	26-Jul-2008	0.9 - 1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	32	230	80	---
BI-08-7	26-Jul-2008	0.9 - 1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	79	27	---
BI-08-8	26-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	180	88	---
	26-Jul-2008	0.9 - 1.2m	58 [#1]	180 [#1]	77 [#1]	330 [#1]	6100 [#3]	4500 [#3]	11000 [#3]	3200 [#3]	8900 [#3]
	26-Jul-2008	1.8 - 2.1m	110 [#1]	160 [#1]	61 [#1]	220 [#1]	5800 [#3]	1800 [#3]	4200 [#3]	1200	2500
SUMP 1	19-Oct-1998	1.0 - 2.0m	< 0.04	< 0.04	< 0.04	< 0.06	---	---	---	---	---
SUMP 2	19-Oct-1998	1.0 - 2.0m	---	---	---	---	---	---	---	---	---
BI-13-5	03-Sep-2013	0.1 - 0.5m	---	---	---	---	---	---	---	---	---
	03-Sep-2013	1.1 - 1.5m	---	---	---	---	---	---	---	---	---
	03-Sep-2013	2.6 - 3.0m	---	---	---	---	---	---	---	---	---
	03-Sep-2013	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BI-14-8	25-Feb-2014	0.2m	< 0.017	< 0.068	< 0.034	< 0.14	< 41	< 34	< 170	< 170	---
	25-Feb-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	69	< 50	---
	25-Feb-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	55	< 50	---
	25-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
(Duplicate)	25-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BI-14-9	23-Feb-2014	0.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	93	< 50	---
	23-Feb-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	23-Feb-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	230 [#3]	310 [#3]	< 50	---
BI-14-10	23-Feb-2014	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	57	< 50	---
	23-Feb-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	23-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	23-Feb-2014	4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
(Duplicate)	23-Feb-2014	4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-10-1	01-Sep-2010	0.0 - 0.3m	< 0.010	< 0.050	< 0.020	< 0.10	< 29	< 20	110	---	---
	01-Sep-2010	0.3 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	83	---	---
	01-Sep-2010	0.6 - 0.75m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	---	---
BIS-10-2	01-Sep-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	39	---	---
	01-Sep-2010	0.3 - 0.6m	< 0.10	< 0.050	< 0.030	< 0.10	< 31	< 20	46	---	---
	01-Sep-2010	0.6 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	16	---	---
BIS-10-3	27-Aug-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	71	---	---
	27-Aug-2010	1.5 - 1.8m	0.88	0.72 [#1]	2.1	8.0	310 [#3]	1300 [#3]	790 [#1]	---	---
	27-Aug-2010	4.2 - 4.5m	0.33	0.51 [#2]	8.4	18	1800 [#4]	7700 [#4]	2600 [#4]	---	---
BIS-10-4	25-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	62	---	---
	25-Aug-2010	1.5 - 2.0m	0.49	0.90 [#1]	0.43	2.0	100	680 [#3]	1500 [#3]	---	---
	25-Aug-2010	4.0 - 4.5m	0.36	0.17 [#2]	0.62	1.6	210	580 [#4]	1100	---	---
BIS-10-5	26-Aug-2010	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	56	---	---
	26-Aug-2010	1.5 - 2.0m	0.019	< 0.020	< 0.010	< 0.040	< 12	< 10	34	---	---
BIS-10-6	26-Aug-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	48	---	---
(Duplicate)	26-Aug-2010	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	50	---	---
	26-Aug-2010	1.2 - 1.5m	0.85	1.8 [#1]	0.97	3.9	63	250 [#3]	330 [#3]	---	---
	26-Aug-2010	3.8 - 4.1m	2.5 [#2]	0.36 [#2]	4.4	7.6	310	800 [#4]	890	---	---
	26-Aug-2010	5.6 - 5.9m	0.069	0.12 [#2]	0.041	0.16	< 12	18	27	---	---
BIS-10-7	28-Aug-2010	0.0 - 0.5m	0.075	0.30 [#1]	0.080	0.48	< 12	< 10	70	---	---
	28-Aug-2010	3.0 - 3.5m	0.043	0.15 [#2]	0.035	0.21	< 12	< 10	41	---	---
BIS-15-1	26-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	140	< 50	---
	26-Sep-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	60	< 50	---
	26-Sep-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	21	53	< 50	---
BIS-15-10	28-Sep-2015	0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	68	< 50	---
	28-Sep-2015	1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-11	28-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	53	< 50	---
	28-Sep-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
(Duplicate)	28-Sep-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	28-Sep-2015	3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-12	28-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	78	< 50	---
	28-Sep-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	53	< 50	---
	28-Sep-2015	3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-13	28-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	55	< 50	---
(Duplicate)	28-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	28-Sep-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	28-Sep-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-14	28-Sep-2015	1.8m	0.023	< 0.020	0.036	< 0.040	51	1300 [#3]	2600 [#3]	750	---
(Duplicate)	28-Sep-2015	1.8m	0.019	< 0.020	0.019	< 0.040	14	1200 [#3]	2900 [#3]	890	3500 [#3]
	28-Sep-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	36	140	< 50	---
	28-Sep-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-2	26-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	120	< 50	---
	26-Sep-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	59	< 50	---
	26-Sep-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	110	< 50	---
BIS-15-3	27-Sep-2015	1.2m	0.092	0.067	< 0.010	< 0.040	26	< 10	62	< 50	---
	27-Sep-2015	1.8m	0.39	0.36 [#1]	0.026	< 0.040	< 12	< 10	60	< 50	---
	27-Sep-2015	3.0m	0.070	0.047	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-4	27-Sep-2015	1.8m	92 [#1]	220 [#1]	58 [#1]	270 [#3]	8700 [#3]	2300 [#3]	2900 [#3]	800	---
	27-Sep-2015	3.0m	1.5 [#1]	2.6 [#1]	0.49	2.8	71	31	69	< 50	---
	27-Sep-2015	3.6m	0.32	0.74 [#2]	0.21	1.2	72	11	< 50	< 50	---
BIS-15-5	27-Sep-2015	1.8m	97 [#1]	210 [#1]	82 [#1]	380 [#3]	12000 [#3]	1800 [#3]	2400 [#3]	670	---
	27-Sep-2015	3.0m	0.69	1.7 [#1]	0.71	4.2	200	22	56	< 50	---
	27-Sep-2015	4.2m	0.27	0.65 [#2]	0.26	1.4	81	14	< 50	< 50	---
BIS-15-6	27-Sep-2015	1.2m	0.051	0.11 [#1]	0.042	0.21	15	57	640 [#3]	250	---
(Duplicate)	27-Sep-2015	1.2m	0.039	0.079	0.027	0.14	< 12	91	1100 [#3]	460	1200
	27-Sep-2015	2.4m	0.0088	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	27-Sep-2015	3.6m	0.027	0.034	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-7	27-Sep-2015	1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	67	< 50	---
(Duplicate)	27-Sep-2015	1.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	60	< 50	---
	27-Sep-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	27-Sep-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---

Advisian
WorleyParsons Group

Table 2A

Soil Analytical Results Sumps 1-5: Organic Parameters

PROJECT No.: 407011-00622-300			Petroleum Hydrocarbons (PHCs)								
Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)
CCME Residential/Parkland Coarse Surface [#1]			1	0.1	50	37	---	---	---	---	---
CCME Residential/Parkland Coarse Sub-Surface [#2]			1	0.1	50	37	---	---	---	---	---
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	300	2800	2800
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	700	380	2500	10000	10000
BIS-15-8	27-Sep-2015	1.2m	< 0.0050	< 0.020	0.018	< 0.040	< 12	300 [#3]	1900 [#3]	830	2700
(Duplicate)	27-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	270 [#3]	1900 [#3]	930	2900 [#3]
	27-Sep-2015	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	96	< 50	---
	27-Sep-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-15-9	28-Sep-2015	1.2m	0.0097	< 0.020	< 0.010	< 0.040	< 12	56	320 [#3]	140	---
(Duplicate)	28-Sep-2015	1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	88	480 [#3]	190	---
	28-Sep-2015	2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	54	< 50	---
	28-Sep-2015	4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-1	29-Feb-2016	0.5 - 0.8m	0.010	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	29-Feb-2016	2.0 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	57	< 50	---
BIS-16-2	01-Mar-2016	0.2 - 0.5m	0.23	0.047	0.033	0.20	26	55	210	56	---
	01-Mar-2016	1.4 - 1.7m	1.2 [#1]	< 0.020	0.036	< 0.040	210 [#3]	63	130	< 50	---
	01-Mar-2016	3.0 - 3.3m	0.54	< 0.020	0.027	0.11	130	22	59	< 50	---
	01-Mar-2016	4.2 - 4.5m	0.072	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-3	01-Mar-2016	0.7 - 1.0m	0.44	< 0.020	0.10	0.088	49	110	190	< 50	---
	01-Mar-2016	2.0 - 2.3m	0.17	< 0.020	0.064	< 0.040	41	120	250	64	---
	01-Mar-2016	3.3 - 3.7m	0.039	< 0.020	< 0.010	< 0.040	< 12	15	53	< 50	---
	01-Mar-2016	4.5 - 4.8m	0.035	< 0.020	< 0.010	< 0.040	< 12	31	67	< 50	---
BIS-16-4	29-Feb-2016	1.5 - 1.8m	2.7 [#1]	< 0.020	0.021	< 0.040	240 [#3]	400 [#3]	630 [#3]	170	---
	29-Feb-2016	2.7 - 3.0m	0.085	< 0.020	< 0.010	< 0.040	14	28	71	< 50	---
	29-Feb-2016	3.5 - 3.8m	1.5 [#2]	< 0.020	< 0.010	< 0.040	< 12	14	63	< 50	---
(Duplicate)	29-Feb-2016	3.5 - 3.8m	0.57	< 0.020	< 0.010	< 0.040	< 12	15	58	< 50	---
BIS-16-5	02-Mar-2016	1.6 - 1.8m	0.015	< 0.020	< 0.010	< 0.040	< 12	< 10	84	< 50	---
	02-Mar-2016	3.0 - 3.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	52	< 50	---
	02-Mar-2016	4.3 - 4.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-6	02-Mar-2016	0.1 - 0.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	110	< 50	---
	02-Mar-2016	2.8 - 3.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
(Duplicate)	02-Mar-2016	2.8 - 3.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	02-Mar-2016	4.2 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-7	02-Mar-2016	0.2 - 0.5m	83 [#1]	71 [#1]	48	280 [#1]	9700 [#3]	5400 [#3]	7100 [#3]	2000	---
	02-Mar-2016	2.5 - 2.7m	44 [#1]	70 [#1]	23	82 [#1]	3300 [#3]	470 [#3]	700 [#3]	190	---
	02-Mar-2016	4.4 - 4.7m	1.6 [#2]	1.3 [#2]	0.43	2.0	110	13	< 50	< 50	---
BIS-16-8	02-Mar-2016	0.1 - 0.4m	0.010	< 0.020	< 0.010	< 0.040	< 12	12	110	< 50	---
	02-Mar-2016	1.8 - 2.1m	0.24	0.069	0.016	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-9	03-Mar-2016	1.2 - 1.4m	0.0081	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	03-Mar-2016	2.6 - 2.9m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	03-Mar-2016	4.5 - 4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
(Duplicate)	03-Mar-2016	4.5 - 4.8m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-10	03-Mar-2016	0.8 - 1.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	68	< 50	---
	03-Mar-2016	2.0 - 2.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	71	< 50	---
	03-Mar-2016	3.7 - 4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS-16-11	03-Mar-2016	1.3 - 1.6m	0.0087	< 0.020	< 0.010	< 0.040	< 12	< 10	54	< 50	---
	03-Mar-2016	2.1 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	57	< 50	---
	03-Mar-2016	3.3 - 3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	54	< 50	---
BIS-16-12	04-Mar-2016	0.7 - 1.0m	63 [#1]	120 [#1]	56 [#1]	300 [#1]	7200 [#3]	14000 [#3]	19000 [#3]	5600 [#3]	---
(Duplicate)	04-Mar-2016	0.7 - 1.0m	87 [#1]	150 [#1]	69 [#1]	350 [#1]	6000 [#3]	14000 [#3]	19000 [#3]	5800 [#3]	---
	04-Mar-2016	2.4 - 2.7m	20 [#1]	23 [#1]	8.8	29	1200 [#3]	860 [#3]	1200 [#3]	360	---
	04-Mar-2016	4.3 - 4.6m	0.34	0.45 [#2]	0.15	0.70	38	22	< 50	< 50	---
BIS-16-13	09-Mar-2016	1.2 - 1.6m	57 [#1]	160 [#1]	42	240 [#1]	6300 [#3]	3300 [#3]	4500 [#3]	1300	---
	09-Mar-2016	3.0 - 3.5m	17 [#2]	12 [#2]	7.5	29	840 [#4]	300	460	130	---
	09-Mar-2016	4.2 - 4.8m	0.029	0.041	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
(Duplicate)	09-Mar-2016	4.2 - 4.8m	0.61	0.81 [#2]	0.25	1.2	60	28	80	< 50	---
BIS-TH16-1	04-Mar-2016	0.8 - 1.1m	0.10	0.039	< 0.010	< 0.040	< 12	11	80	< 50	---
	04-Mar-2016	2.1 - 2.4m	0.016	< 0.020	< 0.010	< 0.040	< 12	< 10	57	< 50	---
	04-Mar-2016	4.5 - 4.8m	0.18	0.12 [#2]	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BIS05-01	30-Aug-2005	0.0 - 0.3m	< 0.04	< 0.1 [#3]	< 0.1	< 0.3	< 10	12	65	---	---
	30-Aug-2005	2.0 - 2.2m	< 0.04	< 0.1 [#3]	< 0.1	< 0.3	< 10	12	69	---	---
BIS05-02	30-Aug-2005	1.0 - 1.2m	8.00 [#1]	4.2 [#1]	7.0	38.7 [#1]	2100 [#3]	3450 [#3]	6230 [#3]	---	6800 [#3]
	30-Aug-2005	1.3 - 1.5m	45.1 [#1]	185 [#1]	64.1 [#1]	287 [#1]	8000 [#3]	28000 [#3]	87200 [#3]	---	100000 [#3]
	30-Aug-2005	3.0 - 3.5m	< 0.04	< 0.1 [#3]	< 0.1	< 0.3	12	11	32	---	---
BIS05-03	30-Aug-2005	0.5 - 1.0m	---	---	---	---	---	---	---	---	---
	30-Aug-2005	1.5 - 2.0m	1.01 [#1]	< 0.1 [#3]	< 0.1	< 0.3	26	< 10	98	---	---
BI-14-7	24-Feb-2014	1.0m	0.082	< 0.058	< 0.029	< 0.12	< 35	56	260	< 150	---
	24-Feb-2014	2.0m	< 0.010	< 0.040	< 0.020	< 0.080	< 24	< 20	160	< 100	---
	24-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	23	240	100	---
(Duplicate)	24-Feb-2014	3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	24-Feb-2014	3.9m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	36	430	200	---
BI-R34-09-1	29-Aug-2009	0.0 - 0.3m	---	---	---	---	---	---	---	---	---
	29-Aug-2009	0.3 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	23	230	---	---
BIBG16-12	03-Mar-2016	1.0 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	86	< 50	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Surface soils, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Coarse-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Coarse-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Coasre-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 2B

Soil Analytical Results Sump 6: Organic Parameters

PROJECT No.: 407011-00622-300

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	PHC								
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**60**	**110**	**120**	**65**	**---**	**---**	**---**	**---**	**---**
CCME Residential/Parkland Fine Sub-Surface [#2]			**120**	**220**	**240**	**130**	**---**	**---**	**---**	**---**	**---**
CCME Canada Wide Standards Surface [#3]			**---**	**---**	**---**	**---**	**210**	**150**	**1300**	**5600**	**5600**
CCME Canada Wide Standards Sub-Surface [#4]			**---**	**---**	**---**	**---**	**800**	**1000**	**3500**	**10000**	**10000**
Sump 6											
BI 08-01	26-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	< 10	---	---
	26-Jul-2008	0.8 - 1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	< 10	---	---
	26-Jul-2008	2.0 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	21	26	---	---
BI-08-02-03	26-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	39	50	---
	26-Jul-2008	2.0 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	15	37	---
B1-08-2	26-Jul-2008	0.0 - 0.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	59	870	370	---
	26-Jul-2008	2.0 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	59	16	---
B1-08-3	26-Jul-2008	0.0 - 0.3m	---	---	---	---	---	---	---	---	---
	26-Jul-2008	2.0 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	50	12	---
BI-13-1	04-Sep-2013	1.1 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	59	< 50	---
	04-Sep-2013	1.8 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	65	< 50	---
	04-Sep-2013	3.2 - 3.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	61	< 50	---
	04-Sep-2013	5.1 - 5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BI-13-2	04-Sep-2013	1.0 - 1.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	04-Sep-2013	1.8 - 2.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	< 50	< 50	---
	04-Sep-2013	3.7 - 4.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	04-Sep-2013	5.2 - 5.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
BI-13-3	04-Sep-2013	1.2 - 1.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	53	< 50	---
	04-Sep-2013	2.0 - 2.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	04-Sep-2013	3.8 - 4.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	58	< 50	---
	04-Sep-2013	5.6 - 6.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	52	< 50	---
	04-Sep-2013	6.7 - 7.1m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	91	< 50	---
BIS6-17-1	26-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	53	< 50	---
	26-Sep-2017	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	10	71	< 50	---
BIS6-17-2	26-Sep-2017	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---
BIS6-17-3	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	58	< 50	---
	26-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	55	< 50	---
BIS6-17-4	26-Sep-2017	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	68	< 50	---
BIS6-17-5	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	80	< 50	---
	26-Sep-2017	2.5 - 3.0m	0.12	0.050	0.28	0.22	43	**600 [#3]**	470	86	---
(Duplicate)	26-Sep-2017	2.5 - 3.0m	0.10	0.046	0.22	0.18	78	**200 [#3]**	200	< 50	---
	26-Sep-2017	3.0 - 3.5m	0.25	0.11	0.96	0.94	130	**1200 [#4]**	860	590	3200
	26-Sep-2017	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---
BIWS-16-1	29-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	71	< 50	---
(Duplicate)	29-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	66	< 50	---
	29-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	60	< 50	---
	29-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	110	< 50	---
BIWS-16-2	29-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	56	< 50	---
	29-Sep-2016	1.5 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	29-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	73	< 50	---
BIWS-16-3	29-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	29-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---
	29-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	52	< 50	---
BIWS-16-4	30-Sep-2016	0.5 - 1.0m	0.0072	< 0.020	< 0.010	< 0.040	< 12	89	960	380	2800
	30-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	0.014	< 0.040	< 12	**240 [#3]**	1200	410	2000
(Duplicate)	30-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**170 [#3]**	1100	400	2000
	30-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	18	110	< 50	---
BIWS-16-5	30-Sep-2016	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	69	< 50	---
	30-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	69	< 50	---
	30-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	66	< 50	---
BIWS-16-6	30-Sep-2016	0.0 - 0.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	14	330	190	---
	30-Sep-2016	0.5 - 1.0m	< 0.0050	< 0.020	0.014	< 0.040	< 12	**210 [#3]**	1000	380	1800
(Duplicate)	30-Sep-2016	0.5 - 1.0m	0.0089	< 0.020	0.017	< 0.040	< 12	**240 [#3]**	1200	430	2000
	30-Sep-2016	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	88	< 50	---
BIWS-16-7	30-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	70	< 50	---
	30-Sep-2016	1.5 - 2.0m	0.015	< 0.020	0.060	< 0.040	< 12	**230 [#3]**	400	100	---
	30-Sep-2016	2.0 - 2.5m	0.0086	< 0.020	< 0.010	< 0.040	< 12	< 10	62	< 50	---
BIWS-16-8	30-Sep-2016	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	290	110	---
	30-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	54	< 50	---
	30-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	92	< 50	---
BIWS-16-9	30-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	79	< 50	---
	30-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	96	< 50	---
	30-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	62	< 50	---
BIWS02-1	23-Jul-2002	0.0 - 1.5m	< 0.04	< 0.10	< 0.10	< 0.2	< 10	< 50	< 50	---	---
	23-Jul-2002	3.0 - 4.5m	< 0.04	< 0.10	< 0.10	< 0.2	< 10	< 50	72	---	---
BIWS02-2	23-Jul-2002	0.0 - 1.5m	< 0.04	< 0.10	< 0.10	< 0.2	< 10	< 50	< 50	---	---
	23-Jul-2002	3.0 - 4.5m	0.21	0.35	0.70	3.4	80	460	450	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Indicator Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIS6-17-SW01	27-Sep-2017	6.4	---	< 0.010	< 0.010	---	0.0042	0.00082	< 0.020	< 0.000020	< 0.0010	< 0.00020	0.082	< 0.00020	---	0.00026	0.00083	< 0.00020	< 0.00010	< 0.00020	0.00011	< 0.0030
BI SW01	23-Aug-2013	**160** [#1]	---	0.0060	0.0050	**26** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2013	**160** [#1]	---	0.0090	< 0.0030	**24** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	**230** [#1]	---	< 0.010	< 0.010	**12** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Aug-2014	**200** [#1]	---	< 0.010	< 0.010	**12** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2015	**200** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2015	**210** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2016	**320** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2016	**310** [#1]	---	0.017	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2017	**210** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	11-Aug-2017	**210** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI SW02	23-Aug-2010	62	7.94	0.012	< 0.003	< 2	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---	---
	21-Aug-2011	63	8.11	0.010	< 0.003	< 2	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---	---
	15-Aug-2012	40	---	0.0078	< 0.0030	2.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	72	---	0.0050	0.0040	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	66	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI SW03	18-Aug-2008	**330** [#1]	7.7	0.007	< 0.003	**5** [#1]	---	---	---	---	---	---	**0.31** [#1]	---	---	---	---	---	---	---	---	---
	18-Aug-2009	**510** [#1]	7.40	0.030	< 0.003	4 [#1]	---	---	---	---	---	---	**0.59** [#1]	---	---	---	---	---	---	---	---	---
	23-Aug-2010	**430** [#1]	7.96	0.004	< 0.003	< 2	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---	---
	21-Aug-2011	**240** [#1]	7.89	< 0.003	< 0.003	< 2	---	---	---	---	---	---	**0.68** [#1]	---	---	---	---	---	---	---	---	---
	16-Aug-2012	**170** [#1]	---	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	23-Aug-2013	**130** [#1]	---	0.0040	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	**250** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	78	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Aug-2016	**260** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2017	**230** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI SW04	16-Aug-2012	**360** [#1]	---	< 0.0030	< 0.0030	< 2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	**380** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**350** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Aug-2016	**320** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2017	**320** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI SW05	23-Aug-2013	**130** [#1]	---	0.018	< 0.0030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	**790** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**850** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Aug-2016	**230** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2017	**300** [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Indicator Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BI SW06	25-Aug-2013	57	---	< 0.0030	< 0.0030	15 [#1]	0.031	0.00070	< 0.020	< 0.000025	< 0.0010	0.0013	0.10	< 0.00020	---	< 0.00020	0.0019	< 0.00020	< 0.00010	< 0.00020	0.00011	0.0056
	03-Aug-2014	120 [#1]	---	0.015	< 0.010	6.5 [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	38	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Aug-2016	41	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-Aug-2017	660 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI 08-1-4	21-Aug-2008	9.7	7.3	0.025	0.009	5 [#1]	< 0.001	< 0.001	< 0.02	0.00041 [#1]	< 0.001	0.014 [#1]	0.20	< 0.0002	---	0.0023	0.039	< 0.001	< 0.0001	< 0.0002	0.020 [#1]	0.030 [#1]
	18-Aug-2009	9	7.32	0.093	0.010	3	0.006	0.0009	0.02	0.00026 [#1]	< 0.001	0.0093 [#1]	3.6 [#1]	< 0.0002	---	0.0014	0.020	0.0009	< 0.0001	< 0.0002	0.016 [#1]	0.019
(Duplicate)	18-Aug-2009	---	---	---	---	7 [#1]	0.005	0.0009	< 0.02	0.00028 [#1]	< 0.001	0.0086 [#1]	3.0 [#1]	< 0.0002	---	0.0013	0.021	0.0009	< 0.0001	< 0.0002	0.016 [#1]	0.017
	23-Aug-2010	9	7.25	0.19	0.015	< 2	0.009	0.0015	0.02	0.00024 [#1]	< 0.001	0.012 [#1]	0.22	< 0.0002	---	0.0008	0.023	0.0006	< 0.0001	< 0.0002	0.013	0.009
(Duplicate)	23-Aug-2010	---	---	---	---	6 [#1]	0.010	0.0015	< 0.02	0.00023 [#1]	< 0.001	0.011 [#1]	0.33 [#1]	< 0.0002	---	0.0008	0.020	0.0006	< 0.0001	< 0.0002	0.013	0.010
	21-Aug-2011	9	---	0.096	0.018	< 2	0.01	< 0.002	< 0.02	0.00016 [#1]	< 0.01 [#1]	0.002	64 [#1]	< 0.002	---	0.002	0.014	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.004	< 0.03
(Duplicate)	21-Aug-2011	---	---	---	---	< 2	0.01	< 0.002	< 0.02	0.00015 [#1]	< 0.01 [#1]	< 0.002	60 [#1]	< 0.002	---	< 0.002	0.014	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.004	< 0.03
	15-Aug-2012	11	7.95	0.28	< 0.0030	< 2.0	0.0065	0.00067	0.020	0.000098 [#1]	< 0.0010	0.0054 [#1]	0.15	< 0.00020	---	0.0069	0.0081	0.00037	< 0.00010	< 0.00020	0.023 [#1]	0.0046
(Duplicate)	15-Aug-2012	---	---	---	---	< 2.0	0.0045	0.00060	< 0.020	0.000078	< 0.0010	0.0058 [#1]	0.14	< 0.00020	---	0.0067	0.0096	0.00035	< 0.00010	< 0.00020	0.023 [#1]	0.0074
BI 08-2-3	23-Aug-2013	310 [#1]	---	0.021	0.016	18 [#1]	0.019	0.0011	0.031	0.00071 [#1]	< 0.0010	0.0021	55 [#1]	< 0.00020	---	0.00057	0.036	0.00081	< 0.00010	< 0.00020	0.013	0.031 [#1]
	04-Aug-2014	520 [#1]	---	0.091	0.013	24 [#1]	0.023	0.0015	< 0.020	0.00049 [#1]	0.0011	0.0017	120 [#1]	< 0.00020	---	0.0012	0.044	0.0010 [#1]	< 0.00010	< 0.00020	0.011	0.018
	07-Aug-2015	250 [#1]	---	0.018	0.014	13 [#1]	0.017	0.00048	0.030	0.00038 [#1]	< 0.0010	0.0020	19 [#1]	< 0.00020	---	0.00058	0.022	0.00069	< 0.00010	< 0.00020	0.012	0.024
	07-Aug-2016	220 [#1]	---	0.033	< 0.010	---	0.0042	0.00040	0.028	0.00051 [#1]	< 0.0010	0.0035	0.18	< 0.00020	---	0.00061	0.024	0.00035	< 0.00010	< 0.00020	0.012	0.020
	15-Aug-2017	500 [#1]	---	0.082	0.053	---	0.026	0.00099	< 0.020	0.00035 [#1]	< 0.0010	0.0014	120 [#1]	< 0.00020	---	0.00071	0.043	0.00099	< 0.00010	< 0.00020	0.0087	0.020
BI 08-3-2	23-Aug-2010	760 [#1]	7.14	0.12	0.026	< 2	0.005	0.0056 [#1]	< 0.02	< 0.00003	< 0.001	0.0008	35 [#1]	< 0.0002	---	0.0032	0.013	0.0008	< 0.0001	< 0.0002	0.0044	0.007
	21-Aug-2011	810 [#1]	7.35	0.024	0.008	< 2	0.01	0.011 [#1]	< 0.02	< 0.00005	< 0.01 [#1]	< 0.002	58 [#1]	< 0.002	---	0.002	0.008	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.004	< 0.03
	16-Aug-2012	970 [#1]	7.36	0.0093	0.0072	< 2.0	0.0066	0.0046	< 0.020	0.000061	< 0.0010	0.0016	97 [#1]	< 0.00020	---	0.0019	0.023	0.00088	< 0.00010	< 0.00020	0.0062	0.013
	25-Aug-2013	820 [#1]	---	0.039	0.0035	24 [#1]	0.011	0.0031	< 0.020	0.000056	< 0.0010	0.00068	50 [#1]	< 0.00020	---	0.0011	0.011	0.00048	< 0.00010	< 0.00020	0.0014	0.0083
	03-Aug-2014	750 [#1]	---	< 0.010	< 0.010	16 [#1]	0.0069	0.0021	< 0.020	0.00014 [#1]	< 0.0010	0.00072	45 [#1]	< 0.00020	---	0.0024	0.011	0.00033	< 0.00010	< 0.00020	0.0021	0.023
BI 08-6-4	25-Aug-2013	200 [#1]	---	0.0062	0.0085	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	190 [#1]	---	0.10	< 0.010	---	0.015	0.0021	< 0.020	0.00011 [#1]	< 0.0010	0.0012	60 [#1]	< 0.00020	---	0.0044	0.013	0.00071	< 0.00010	< 0.00020	0.0046	0.015
	08-Aug-2015	230 [#1]	---	0.027	0.013	---	0.0097	0.0030	< 0.020	0.000091 [#1]	< 0.0010	0.00059	48 [#1]	< 0.00020	---	0.0058	0.015	0.00088	< 0.00010	< 0.00020	0.0050	0.018
	08-Aug-2016	270 [#1]	---	0.013	0.012	---	0.0098	0.0020	< 0.020	0.000098 [#1]	< 0.0010	0.00050	76 [#1]	< 0.00020	---	0.0045	0.014	0.00084	< 0.00010	< 0.00020	0.0046	0.0097
	11-Aug-2017	330 [#1]	---	< 0.010	< 0.010	---	0.026	0.0071 [#1]	< 0.020	0.000091 [#1]	0.0012	0.00096	56 [#1]	< 0.00020	---	0.0071	0.034	0.0015 [#1]	< 0.00010	< 0.00020	0.0050	0.017
BI 08-7-2	21-Aug-2011	340 [#1]	---	0.038	0.005	< 2	0.01	< 0.002	< 0.02	0.00013 [#1]	< 0.01 [#1]	< 0.002	29 [#1]	< 0.002	---	0.003	0.022	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.017 [#1]	0.03 [#1]
	16-Aug-2012	350 [#1]	---	< 0.0030	< 0.0030	< 2.0	0.0090	0.0012	< 0.020	0.00017 [#1]	0.0011	0.0029	22 [#1]	< 0.00020	---	0.0031	0.021	0.00056	< 0.00010	< 0.00020	0.011	0.014
	24-Aug-2013	190 [#1]	---	< 0.0030	0.0036	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	160 [#1]	---	2.7	< 0.010	---	0.046	0.0075 [#1]	< 0.020	< 0.00020 [#1]	< 0.010 [#1]	0.0043 [#1]	46 [#1]	< 0.0020	---	0.0029	0.019	< 0.0020 [#1]	< 0.0010 [#1]	< 0.0020 [#1]	0.0084	< 0.030
	09-Aug-2015	82	---	0.13	0.012	---	0.026	0.0050 [#1]	< 0.020	0.000025	0.0018	0.0026	24 [#1]	< 0.00020	---	0.0026	0.020	0.00088	< 0.00010	< 0.00020	0.0039	0.0069
BI 08-8-4	24-Aug-2013	870 [#1]	---	0.0091	0.0075	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	24-Aug-2013	840 [#1]	---	0.0056	0.0060	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Aug-2014	710 [#1]	---	0.037	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Aug-2014	820 [#1]	---	0.044	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2015	1000 [#1]	---	0.11	0.020	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Indicator Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
(Duplicate)	08-Aug-2015	1100 [#1]	---	0.10	0.013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Aug-2016	1100 [#1]	---	0.019	0.013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2016	1200 [#1]	---	0.016	0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2017	770 [#1]	---	0.011	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	11-Aug-2017	770 [#1]	---	< 0.010	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI DP 08-5	25-Aug-2013	36	---	0.026	< 0.0030	---	0.0064	0.00085	0.021	0.00020 [#1]	< 0.0010	0.0026	1.7 [#1]	< 0.00020	---	0.00047	0.0095	0.00024	< 0.00010	< 0.00020	0.0085	0.018
	03-Aug-2014	61	---	0.32	< 0.010	---	0.0069	0.0023	< 0.020	0.000059	< 0.0010	0.0019	3.9 [#1]	< 0.00020	---	0.0012	0.014	0.00029	< 0.00010	< 0.00020	0.010	0.016
	09-Aug-2015	130 [#1]	---	0.040	0.012	---	0.0055	0.00077	< 0.020	0.00018 [#1]	< 0.0010	0.0044 [#1]	0.24	< 0.00020	---	0.00097	0.0096	0.00037	< 0.00010	< 0.00020	0.0079	0.012
	10-Aug-2016	130 [#1]	---	0.017	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Aug-2017	140 [#1]	---	0.033	< 0.010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BI SW-13-1	19-Sep-2013	2.2	8.00	< 0.0030	< 0.0030	7.9 [#1]	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	04-Aug-2014	4.0	8.04	0.31	< 0.010	4.6 [#1]	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	07-Aug-2015	9.5	7.65	< 0.010	< 0.010	4.4 [#1]	---	---	---	---	---	---	0.079	---	---	---	---	---	---	---	---	---
	11-Aug-2016	1.7	7.79	< 0.010	< 0.010	< 2.0	---	---	---	---	---	---	0.067	---	---	---	---	---	---	---	---	---
	14-Aug-2017	3.9	---	< 0.010	< 0.010	8.3 [#1]	---	---	---	---	---	---	5.4 [#1]	---	---	---	---	---	---	---	---	---
BI-13-1-4	19-Sep-2013	9.5	7.09	< 0.0030	0.0082	19 [#1]	0.0050	0.0034	< 0.020	< 0.000025	< 0.0010	0.00049	54 [#1]	< 0.00020	---	0.0026	0.014	0.0011 [#1]	< 0.00010	< 0.00020	0.0023	0.0066
	04-Aug-2014	8.4	6.99	0.063	< 0.010	11 [#1]	0.028	0.011 [#1]	0.026	< 0.000020	0.0012	0.00080	52 [#1]	< 0.00020	---	0.0029	0.011	0.00065	< 0.00010	< 0.00020	0.0083	0.011
	07-Aug-2015	7.7	7.07	0.018	0.014	11 [#1]	0.018	0.011 [#1]	0.025	0.000026	< 0.0010	0.00034	49 [#1]	< 0.00020	---	0.0025	0.014	0.00066	< 0.00010	< 0.00020	0.0048	0.0042
	07-Aug-2016	7.9	7.14	0.053	0.013	< 2.0	0.026	0.012 [#1]	0.023	< 0.000020	< 0.0010	< 0.00020	47 [#1]	< 0.00020	---	0.0013	0.011	0.00069	< 0.00010	< 0.00020	0.0034	0.0057
	15-Aug-2017	6.2	---	0.016	< 0.010	8.3 [#1]	0.0069	0.0014	0.021	0.00010 [#1]	< 0.0010	0.0015	9.1 [#1]	< 0.00020	---	0.0031	0.015	0.00080	< 0.00010	< 0.00020	0.011	0.021
BI-13-11	19-Sep-2013	31	7.77	< 0.0030	< 0.0030	9.2 [#1]	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	03-Aug-2014	36	7.91	0.56	< 0.010	3.9	---	---	---	---	---	---	0.079	---	---	---	---	---	---	---	---	---
	09-Aug-2015	33	7.66	< 0.010	< 0.010	5.9 [#1]	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	10-Aug-2016	36	7.92	< 0.010	< 0.010	4.4 [#1]	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
	14-Aug-2017	58	---	< 0.010	< 0.010	49 [#1]	---	---	---	---	---	---	0.11	---	---	---	---	---	---	---	---	---
BI-13-12	19-Sep-2013	40	7.95	< 0.0030	< 0.0030	10 [#1]	---	---	---	---	---	---	< 0.060	---	---	---	---	---	---	---	---	---
BI-13-2-4.5	19-Sep-2013	20	7.45	0.0036	< 0.0030	21 [#1]	0.012	0.0074 [#1]	< 0.020	< 0.000025	0.0013	0.00068	38 [#1]	< 0.00020	---	0.0054	0.024	0.0014 [#1]	< 0.00010	< 0.00020	0.0023	0.0049
	04-Aug-2014	22	7.29	< 0.010	< 0.010	12 [#1]	0.030	0.011 [#1]	< 0.020	< 0.000020	0.0013	0.00065	70 [#1]	< 0.00020	---	0.0035	0.011	0.0011 [#1]	< 0.00010	< 0.00020	0.0022	< 0.0030
	07-Aug-2015	18	7.32	0.012	0.015	15 [#1]	0.016	0.0086 [#1]	< 0.020	0.000024	< 0.0010	0.00048	50 [#1]	< 0.00020	---	0.0036	0.011	0.0012 [#1]	< 0.00010	< 0.00020	0.0017	0.0041
	07-Aug-2016	16	7.35	< 0.010	< 0.010	< 2.0	0.016	0.011 [#1]	< 0.020	< 0.000020	0.0028	< 0.00020	51 [#1]	< 0.00020	---	0.0044	0.0077	0.0013 [#1]	< 0.00010	< 0.00020	0.0012	0.0063
	15-Aug-2017	16	---	< 0.010	< 0.010	20 [#1]	0.018	0.0082 [#1]	< 0.020	< 0.000020	0.0011	0.00061	43 [#1]	< 0.00020	---	0.0048	0.016	0.0012 [#1]	< 0.00010	< 0.00020	0.0018	0.0047

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Indicator Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.000026**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BI-13-3-4.5	19-Sep-2013	11	7.52	0.011	< 0.0030	**12** [#1]	0.013	0.0043	< 0.020	< 0.000025	0.0011	0.00092	**21** [#1]	< 0.00020	---	0.017	0.019	0.00079	< 0.00010	< 0.00020	0.0045	0.0080
(Duplicate)	19-Sep-2013	11	7.54	0.021	< 0.0030	**14** [#1]	0.012	0.0045	< 0.020	< 0.000025	0.0011	0.00072	**21** [#1]	< 0.00020	---	0.017	0.021	0.00076	< 0.00010	< 0.00020	0.0044	0.0083
	04-Aug-2014	13	7.72	0.048	0.010	**8.4** [#1]	0.012	0.0028	< 0.020	0.000063	< 0.0010	0.0013	**5.0** [#1]	< 0.00020	---	0.025	0.018	**0.0014** [#1]	< 0.00010	< 0.00020	0.010	0.016
	07-Aug-2015	11	7.44	0.042	0.015	**4.1** [#1]	0.010	0.0027	< 0.020	**0.00010** [#1]	< 0.0010	0.0012	**4.6** [#1]	< 0.00020	---	0.014	0.019	**0.0015** [#1]	< 0.00010	< 0.00020	0.0098	0.012
	08-Aug-2016	8.5	7.66	0.029	< 0.010	< 2.0	0.0097	0.0027	< 0.020	**0.00014** [#1]	< 0.0010	0.0012	**5.0** [#1]	< 0.00020	---	0.016	0.023	**0.0013** [#1]	< 0.00010	< 0.00020	0.011	0.021
	15-Aug-2017	8.7	---	0.085	< 0.010	**9.3** [#1]	0.0090	0.0012	< 0.020	**0.00017** [#1]	< 0.0010	0.0025	**1.0** [#1]	< 0.00020	---	0.019	0.022	**0.0018** [#1]	< 0.00010	< 0.00020	0.010	0.015
	22-Nov-2017	6.5	---	0.043	< 0.010	3.8	0.0081	0.0016	< 0.020	0.000071	< 0.0010	0.00094	**4.0** [#1]	< 0.00020	< 0.0000020	0.017	0.019	**0.0012** [#1]	< 0.00010	< 0.00020	0.0083	0.012
BI-13-5-2	03-Aug-2014	**300** [#1]	7.52	0.011	< 0.010	**18** [#1]	0.0094	0.0016	< 0.020	**0.00010** [#1]	< 0.0010	0.0029	**5.1** [#1]	< 0.00020	---	0.0057	0.014	0.00049	< 0.00010	< 0.00020	0.0092	0.0097
	09-Aug-2015	---	---	---	---	**12** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Aug-2016	95	7.98	0.14	< 0.010	3.3	0.0089	0.00057	< 0.020	**0.000099** [#1]	< 0.0010	0.0039	< 0.060	< 0.00020	---	0.0022	0.0059	0.00021	< 0.00010	< 0.00020	0.0023	0.0049
BI-13-6-2	03-Aug-2014	9.8	7.16	0.20	< 0.010	**15** [#1]	0.018	0.0019	< 0.020	**0.00012** [#1]	< 0.0010	**0.0046** [#1]	**2.2** [#1]	< 0.00020	---	0.0036	0.0092	0.00047	< 0.00010	< 0.00020	0.0034	0.011
	09-Aug-2015	8.3	7.40	0.014	0.012	**15** [#1]	0.029	0.0038	< 0.020	**0.00011** [#1]	< 0.0010	0.0034	**2.2** [#1]	0.00041	---	0.0039	0.011	0.00066	< 0.00010	< 0.00020	0.0028	0.0061
	10-Aug-2016	8.5	7.74	0.052	< 0.010	**10** [#1]	0.032	0.0024	< 0.020	**0.00015** [#1]	< 0.0010	0.0036	**1.5** [#1]	0.00035	---	0.0034	0.012	0.00078	< 0.00010	< 0.00020	0.0032	0.0065
BI-14-10-3	04-Aug-2014	**220** [#1]	6.97	< 0.010	< 0.010	**9.1** [#1]	0.0066	0.0013	0.067	**0.000092** [#1]	< 0.0010	0.0017	**2.7** [#1]	< 0.00020	---	0.0031	0.011	0.00020	< 0.00010	< 0.00020	0.0074	0.028
	09-Aug-2015	96	7.29	0.016	0.012	**20** [#1]	0.0092	**0.0074** [#1]	< 0.020	< 0.000020	< 0.0010	0.0017	**10** [#1]	0.00032	---	0.0014	0.0058	0.00051	< 0.00010	< 0.00020	0.0032	0.0043
	11-Aug-2016	**200** [#1]	7.58	< 0.010	< 0.010	< 2.0	0.0086	0.0027	< 0.020	0.000058	< 0.0010	0.0012	**13** [#1]	< 0.00020	---	0.0022	0.011	0.00042	< 0.00010	< 0.00020	0.0058	0.013
BI-14-8-3	04-Aug-2014	9.3	7.29	0.46	< 0.010	**6.7** [#1]	0.0097	0.0021	< 0.020	**0.00015** [#1]	< 0.0010	**0.0049** [#1]	**8.8** [#1]	0.00024	---	0.0018	0.011	0.00057	< 0.00010	< 0.00020	0.0077	0.0057
	08-Aug-2015	7.5	7.24	0.084	< 0.010	< 2.0	0.0080	0.0036	< 0.020	0.000026	< 0.0010	< 0.00020	**21** [#1]	0.00020	---	0.0013	0.017	0.00064	< 0.00010	< 0.00020	0.014	0.014
BI-14-9-3	04-Aug-2014	17	7.55	0.20	< 0.010	**23** [#1]	0.017	0.0023	< 0.020	0.000022	< 0.0010	**0.011** [#1]	**6.3** [#1]	< 0.00020	---	0.0030	0.013	0.00094	< 0.00010	< 0.00020	0.0051	0.011
	08-Aug-2015	19	7.31	< 0.010	< 0.010	3.1	0.012	0.0032	< 0.020	< 0.000020	< 0.0010	< 0.00020	**14** [#1]	0.00025	---	0.0014	0.010	**0.0011** [#1]	< 0.00010	< 0.00020	0.0044	0.0042
	10-Aug-2016	26	7.56	0.12	0.028	**9.2** [#1]	0.021	**0.0055** [#1]	< 0.020	< 0.000020	< 0.0010	0.00070	**24** [#1]	< 0.00020	---	0.0014	0.0082	0.00088	< 0.00010	< 0.00020	0.0056	0.017
BIS 02-4-5	22-Aug-2004	**401** [#1]	7.1	< 2.0	< 0.06	---	< 0.025	**< 0.025** [#1]	0.041	**0.00107** [#1]	< 0.005	**0.013** [#1]	**15.76** [#1]	< 0.005	**< 0.00005** [#1]	< 0.005	0.048	**< 0.005** [#1]	**< 0.0005** [#1]	**< 0.0040** [#1]	0.014	< 0.005
	24-Aug-2005	**468** [#1]	7.4	< 0.2	< 0.06	**40** [#1]	0.006	< 0.005	< 0.05	**0.00140** [#1]	< 0.007	**0.0192** [#1]	**2.26** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.045	**0.004** [#1]	< 0.0001	< 0.0008	0.0148	**0.033** [#1]
	21-Aug-2006	**433** [#1]	7.2	< 0.2	< 0.06	**24** [#1]	< 0.005	< 0.005	< 0.05	**0.00122** [#1]	< 0.007	**0.015** [#1]	**3.58** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.050	0.001 [#1]	< 0.0001	< 0.0008	0.013	0.017
(Duplicate)	21-Aug-2006	---	---	---	---	**39** [#1]	---	< 0.005	< 0.05	**0.00112** [#1]	< 0.007	**0.016** [#1]	**3.62** [#1]	< 0.001	**< 0.00005** [#1]	< 0.006	0.050	< 0.001	< 0.0001	---	0.013	0.025
	18-Aug-2009	**1100** [#1]	7.26	0.025	< 0.003	3	< 0.005	0.002	0.06	**0.0022** [#1]	< 0.005	**0.006** [#1]	0.08	< 0.001	---	< 0.001	0.033	< 0.001	**< 0.0005** [#1]	**< 0.001** [#1]	0.015 [#1]	0.03 [#1]
	23-Aug-2010	**1100** [#1]	7.02	0.052	< 0.003	**5** [#1]	0.002	0.0022	0.06	**0.0025** [#1]	< 0.001	**0.0060** [#1]	0.23	< 0.0002	---	0.0006	0.048	0.0004	< 0.0001	< 0.0002	**0.017** [#1]	0.027
BIS 97-1-3	18-Aug-2009	22	7.47	0.074	0.006	2	0.003	0.0014	< 0.02	**0.00011** [#1]	< 0.001	0.0027	**17** [#1]	< 0.0002	---	0.0027	0.017	0.0007	< 0.0001	< 0.0002	0.0056	0.015
	23-Aug-2010	25	7.39	0.083	0.012	3	0.001	0.0017	< 0.02	0.00009 [#1]	< 0.001	0.0011	**13** [#1]	< 0.0002	---	0.0031	0.014	0.0007	0.0001 [#1]	< 0.0002	0.0053	0.008
	21-Aug-2011	22	---	0.35	0.009	< 2	< 0.01	< 0.002	< 0.02	**0.00015** [#1]	**< 0.01** [#1]	0.002	**4.5** [#1]	< 0.002	---	0.003	0.014	**< 0.002** [#1]	**< 0.001** [#1]	**< 0.002** [#1]	0.006	< 0.03
	15-Aug-2012	21	7.60	0.13	0.014	< 2.0	0.0084	0.0018	< 0.020	**0.00015** [#1]	< 0.0010	0.0022	**29** [#1]	< 0.00020	---	0.0058	0.013	0.00064	< 0.00010	< 0.00020	0.0037	0.0095
	22-Nov-2017	20	---	0.050	0.019	**14** [#1]	0.0094	0.0021	< 0.020	0.000030	< 0.0010	0.00099	**22** [#1]	< 0.00020	< 0.0000020	0.0051	0.0092	**0.0012** [#1]	< 0.00010	< 0.00020	0.0019	0.0041

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Indicator Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BIS 97-2-4	21-Aug-2006	1890 [#1]	7.6	< 0.2	< 0.06	41 [#1]	< 0.005	< 0.005	< 0.05	0.00203 [#1]	< 0.007	0.014 [#1]	0.292	< 0.001	< 0.00005 [#1]	< 0.006	0.033	< 0.001	< 0.0001	< 0.0008	0.015 [#1]	0.020
	19-Aug-2007	1550 [#1]	7.0	0.2	< 0.06	19 [#1]	0.004	0.001	0.02	0.00142 [#1]	0.002	0.0141 [#1]	0.09	< 0.0002	---	0.0004	0.0153	0.004 [#1]	< 0.0001	< 0.0002	0.0217 [#1]	0.019
(Duplicate)	19-Aug-2007	---	---	---	---	< 1	0.005	< 0.001	< 0.02	0.00148 [#1]	0.008	0.0147 [#1]	30.3 [#1]	< 0.0002	---	0.0003	0.0164	0.004 [#1]	< 0.0001	< 0.0002	0.0190 [#1]	0.022
	18-Aug-2008	690 [#1]	7.2	0.059	0.005	20 [#1]	< 0.001	< 0.001	< 0.02	0.00035 [#1]	< 0.001	0.0053 [#1]	0.50 [#1]	< 0.0002	---	0.0012	0.012	< 0.001	< 0.0001	< 0.0002	0.012	0.025
	18-Aug-2009	2300 [#1]	6.98	0.010	0.003	4 [#1]	0.003	0.0030	< 0.02	0.000070	< 0.001	0.0023	83 [#1]	< 0.0002	---	0.0010	0.034	0.0008	< 0.0001	< 0.0002	0.016 [#1]	0.016
	23-Aug-2010	1500 [#1]	6.84	0.066	0.013	< 2	0.001	0.0027	< 0.02	< 0.00003	< 0.001	0.0010	59 [#1]	< 0.0002	---	0.0017	0.033	0.0006	< 0.0001	< 0.0002	0.015 [#1]	0.006
BIS 97-3-5	22-Aug-2004	123 [#1]	---	< 2.0	< 0.06	---	< 0.015	< 0.015 [#1]	0.016	0.000078	< 0.005	0.014 [#1]	11.71 [#1]	< 0.003	< 0.00005 [#1]	< 0.005	0.028	< 0.003 [#1]	< 0.0003 [#1]	< 0.0024 [#1]	0.009	< 0.005
	24-Aug-2005	139 [#1]	7.6	< 0.2	< 0.06	15 [#1]	0.005	< 0.005	< 0.05	0.00024 [#1]	< 0.007	0.0119 [#1]	3.68 [#1]	< 0.001	< 0.00005 [#1]	< 0.006	0.027	0.002 [#1]	< 0.0001	< 0.0008	0.01	0.009
	21-Aug-2006	112	7.5	< 0.2	< 0.06	26 [#1]	< 0.005	< 0.005	< 0.05	0.00052 [#1]	< 0.007	0.008 [#1]	4.34 [#1]	< 0.001	< 0.00005 [#1]	< 0.006	0.030	< 0.001	< 0.0001	< 0.0008	0.009	0.017
	19-Aug-2007	205 [#1]	7.2	< 0.2	< 0.06	< 10000 [#1]	0.003	0.001	< 0.02	0.00050 [#1]	0.006	0.0133 [#1]	0.29	< 0.0002	---	0.0017	0.0157	0.002 [#1]	< 0.0001	< 0.0002	0.0129	0.025
	18-Aug-2008	82	7.3	0.040	0.006	7 [#1]	0.001	< 0.001	< 0.02	0.00034 [#1]	< 0.001	0.0099 [#1]	0.21	< 0.0002	---	0.0027	0.015	< 0.001	< 0.0001	< 0.0002	0.010	0.049 [#1]
BIS-10-3-DP	24-Aug-2013	100	7.92	< 0.0030	0.0045	19 [#1]	0.047	0.0079 [#1]	0.033	0.000073	< 0.0010	0.0024	2.0 [#1]	< 0.00020	---	0.0057	0.016	0.0013 [#1]	< 0.00010	< 0.00020	0.0060	0.0055
	03-Aug-2014	130 [#1]	7.64	0.048	< 0.010	45 [#1]	0.020	0.0021	< 0.020	0.000059	< 0.0010	0.0034	0.89 [#1]	< 0.00020	---	0.0054	0.0080	0.00038	< 0.00010	< 0.00020	0.0060	0.0080
	08-Aug-2015	140 [#1]	7.55	0.011	< 0.010	< 4.0	0.026	0.0029	< 0.020	0.00015 [#1]	< 0.0010	0.0030	0.51 [#1]	< 0.00020	---	0.0042	0.011	0.00044	< 0.00010	< 0.00020	0.0053	0.0076
	08-Aug-2016	120 [#1]	7.61	0.017	< 0.010	---	0.022	0.0023	< 0.020	0.000098 [#1]	< 0.0010	0.0022	0.83 [#1]	< 0.00020	---	0.0036	0.010	0.00049	< 0.00010	< 0.00020	0.0062	0.0073
	11-Aug-2017	110	---	0.020	< 0.010	---	---	---	---	---	---	---	0.16	---	---	---	---	---	---	---	---	---
BIS-10-4-DP	29-Sep-2010	19	7.85	0.14	0.005	---	---	---	---	---	---	---	0.14	---	---	---	---	---	---	---	---	---
	16-Aug-2012	29	7.67	0.046	0.011	---	---	---	---	---	---	---	1.0 [#1]	---	---	---	---	---	---	---	---	---
	24-Aug-2013	25	7.82	< 0.0030	0.0048	16 [#1]	0.010	0.0019	< 0.020	0.00011 [#1]	< 0.0010	0.0023	0.44 [#1]	< 0.00020	---	0.0023	0.0094	0.00071	< 0.00010	< 0.00020	0.010	0.0080
BIS-10-2-3	21-Aug-2011	400 [#1]	7.75	< 0.003	< 0.003	17 [#1]	< 0.01	0.005 [#1]	1.0	< 0.00005	< 0.01 [#1]	< 0.002	7.7 [#1]	< 0.002	---	0.008	0.017	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.011	< 0.03
	16-Aug-2012	190 [#1]	7.58	< 0.0030	< 0.0030	10 [#1]	0.0040	0.0049	0.78	0.000028	< 0.0010	0.0018	3.7 [#1]	< 0.00020	---	0.0097	0.019	0.00052	< 0.00010	< 0.00020	0.0060	0.022
	25-Aug-2013	38	---	< 0.0030	< 0.0030	20 [#1]	0.011	0.0078 [#1]	0.34	< 0.000025	< 0.0010	0.00043	2.6 [#1]	< 0.00020	---	0.0043	0.0084	0.00029	< 0.00010	< 0.00020	0.0027	0.0035
	03-Aug-2014	7.9	---	< 0.010	< 0.010	9.2 [#1]	0.0087	0.0046	0.16	< 0.000020	< 0.0010	< 0.00020	0.34 [#1]	< 0.00020	---	0.0011	0.00070	< 0.00020	< 0.00010	< 0.00020	0.00039	0.0037
	08-Aug-2015	60	---	< 0.010	< 0.010	6.4 [#1]	< 0.0030	0.0059 [#1]	0.13	< 0.000020	< 0.0010	< 0.00020	8.5 [#1]	< 0.00020	---	0.0039	0.0059	0.00058	< 0.00010	< 0.00020	0.0044	0.0055
BIS-10-1-3	21-Aug-2011	580 [#1]	9.52 [#1]	< 0.003	< 0.003	27 [#1]	0.03	0.008 [#1]	0.25	< 0.00005	< 0.01 [#1]	< 0.002	< 0.06	< 0.002	---	0.028	0.017	0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	< 0.001	< 0.03
	16-Aug-2012	490 [#1]	9.65 [#1]	< 0.0030	< 0.0030	20 [#1]	0.12 [#1]	0.0088 [#1]	0.21	0.000033	< 0.0010	0.00034	0.084	< 0.00020	---	0.036	0.0071	0.00084	< 0.00010	< 0.00020	0.00021	< 0.0030
(Duplicate)	16-Aug-2012	---	---	---	---	19 [#1]	0.14 [#1]	0.0090 [#1]	0.20	0.000032	< 0.0010	0.00041	0.077	< 0.00020	---	0.036	0.0072	0.00099	< 0.00010	< 0.00020	0.00018	< 0.0030
	25-Aug-2013	480 [#1]	---	< 0.015	0.021	33 [#1]	0.21 [#1]	0.011 [#1]	0.092	0.000046	< 0.0010	0.00082	0.34 [#1]	0.00034	---	0.044	0.013	0.0021 [#1]	< 0.00010	< 0.00020	0.00012	< 0.0030
(Duplicate)	25-Aug-2013	490 [#1]	---	0.016	0.023	54 [#1]	0.21 [#1]	0.0098 [#1]	0.090	0.000033	< 0.0010	0.00062	0.20	0.00028	---	0.043	0.013	0.0022 [#1]	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	03-Aug-2014	530 [#1]	9.11 [#1]	< 0.010	< 0.010	33 [#1]	0.044	0.011 [#1]	0.22	0.00011 [#1]	< 0.0010	0.00034	0.21	< 0.00020	---	0.026	0.0096	0.0010 [#1]	< 0.00010	< 0.00020	0.00046	< 0.0030
(Duplicate)	03-Aug-2014	540 [#1]	8.74	< 0.010	< 0.010	32 [#1]	0.043	0.012 [#1]	0.22	< 0.000020	< 0.0010	< 0.00020	0.27	< 0.00020	---	0.026	0.0096	0.0010 [#1]	< 0.00010	< 0.00020	0.00054	< 0.0030
	09-Aug-2015	490 [#1]	10.7 [#1]	0.021	0.010	46 [#1]	0.092	0.011 [#1]	0.065	0.000022	< 0.0010	0.0014	0.068	0.00030	---	0.033	0.0098	0.0089 [#1]	< 0.00010	< 0.00020	0.00017	< 0.0030
(Duplicate)	09-Aug-2015	490 [#1]	10.7 [#1]	0.027	< 0.010	38 [#1]	0.066	0.012 [#1]	0.075	< 0.000020	< 0.0010	0.0012	< 0.060	0.00035	---	0.032	0.0097	0.0057 [#1]	< 0.00010	< 0.00020	0.00028	< 0.0030

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-300		Indicator Parameters and Phenols					Dissolved Metals															
Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		120	(6.5 - 9)	3	0.06	4	0.1	0.005	1.5	0.00009	0.0089	0.004	0.3	0.007	0.000026	0.073	0.15	0.001	0.00025	0.0008	0.015	0.03
BIS-10-3-3	21-Aug-2011	130 [#1]	7.82	0.008	< 0.003	< 2	< 0.01	0.002	0.02	0.00019 [#1]	< 0.01 [#1]	0.003	3.4 [#1]	< 0.002	---	< 0.002	0.041	< 0.002 [#1]	< 0.001 [#1]	< 0.002 [#1]	0.017 [#1]	< 0.03
	15-Aug-2012	110	7.55	0.0053	< 0.0030	< 2.0	0.0070	0.00095	< 0.020	0.00026 [#1]	< 0.0010	0.0073 [#1]	0.73 [#1]	< 0.00020	---	0.0014	0.031	0.00058	< 0.00010	< 0.00020	0.0071	0.013
	24-Aug-2013	100	---	0.025	0.0047	10 [#1]	0.011	0.0018	0.034	0.00013 [#1]	< 0.0010	0.0022	3.8 [#1]	< 0.00020	---	0.0020	0.030	0.0010 [#1]	< 0.00010	< 0.00020	0.0090	0.011
	03-Aug-2014	110	---	0.052	< 0.010	8.1 [#1]	0.0078	0.00075	< 0.020	0.00018 [#1]	< 0.0010	0.0056 [#1]	0.17	< 0.00020	---	0.0026	0.015	0.00041	< 0.00010	< 0.00020	0.0076	0.011
	08-Aug-2015	100	---	0.025	< 0.010	2.1	< 0.0030	0.00068	0.021	0.00013 [#1]	< 0.0010	0.0034	0.10	< 0.00020	---	0.0021	0.014	0.00043	< 0.00010	< 0.00020	0.0060	0.0081
BIS-16-1-3	10-Aug-2016	120 [#1]	7.52	< 0.010	< 0.010	5.8 [#1]	0.019	0.0037	< 0.020	0.000050	< 0.0010	0.0020	49 [#1]	< 0.00020	---	0.0027	0.017	0.00064	< 0.00010	< 0.00020	0.0077	0.016
	10-Aug-2017	100	---	< 0.010	< 0.010	9.5 [#1]	0.013	0.0014	0.038	0.00024 [#1]	< 0.0010	0.0013	9.4 [#1]	< 0.00020	---	0.0013	0.017	0.00042	< 0.00010	< 0.00020	0.0092	0.011
(Duplicate)	10-Aug-2017	100	---	< 0.010	< 0.010	8.8 [#1]	0.0081	0.0015	0.039	0.00025 [#1]	< 0.0010	0.0014	10 [#1]	< 0.00020	---	0.0013	0.017	0.00036	< 0.00010	< 0.00020	0.0090	0.011
BIS-16-7-5	08-Aug-2016	610 [#1]	7.28	0.054	0.033	200 [#1]	0.0077	0.0038	< 0.020	0.000023	< 0.0010	0.00057	50 [#1]	< 0.00020	---	0.0066	0.0061	0.00083	< 0.00010	< 0.00020	0.0076	0.011
	11-Aug-2017	620 [#1]	---	< 0.010	< 0.010	110 [#1]	0.015	0.011 [#1]	< 0.020	< 0.000020	< 0.0010	0.00056	43 [#1]	< 0.00020	---	0.0069	0.0026	0.00077	< 0.00010	< 0.00020	0.0062	0.0035
BIS-16-8-3	08-Aug-2016	13	6.91	0.016	0.011	< 2.0	0.014	0.0011	0.042	0.00034 [#1]	< 0.0010	0.0042 [#1]	0.29	< 0.00020	---	0.0023	0.034	0.00065	< 0.00010	< 0.00020	0.015 [#1]	0.032 [#1]
	11-Aug-2017	14	---	< 0.010	< 0.010	15 [#1]	0.019	0.0016	0.023	0.000091 [#1]	< 0.0010	0.0019	4.3 [#1]	< 0.00020	---	0.0016	0.042	0.00082	< 0.00010	< 0.00020	0.027 [#1]	0.026
BIS-16-10-4	11-Aug-2016	600 [#1]	7.48	< 0.010	< 0.010	3.8	0.018	0.0011	< 0.020	0.00011 [#1]	< 0.0010	0.0022	7.7 [#1]	< 0.00020	---	0.0051	0.026	0.0010 [#1]	< 0.00010	< 0.00020	0.020 [#1]	0.014
	11-Aug-2017	480 [#1]	---	< 0.010	< 0.010	12 [#1]	0.011	0.0011	< 0.020	0.00022 [#1]	< 0.0010	0.0049 [#1]	3.4 [#1]	< 0.00020	---	0.0045	0.017	0.00048	< 0.00010	< 0.00020	0.021 [#1]	0.0055
BIS-16-11-4	10-Aug-2016	190 [#1]	7.38	< 0.010	< 0.010	4.5 [#1]	0.014	0.0025	< 0.020	0.000055	< 0.0010	0.0014	53 [#1]	< 0.00020	---	0.0026	0.022	0.00088	< 0.00010	< 0.00020	0.017 [#1]	0.016
	11-Aug-2017	96	---	< 0.010	< 0.010	20 [#1]	0.012	0.0021	< 0.020	0.000057	< 0.0010	0.0016	72 [#1]	< 0.00020	---	0.0038	0.019	0.0011 [#1]	< 0.00010	< 0.00020	0.011	0.011
BIS-16-12-5	08-Aug-2016	540 [#1]	7.33	< 0.010	< 0.010	150 [#1]	0.0054	0.0037	< 0.020	< 0.000020	< 0.0010	< 0.00020	32 [#1]	< 0.00020	---	0.0038	0.011	0.00068	< 0.00010	< 0.00020	0.0093	0.014
	11-Aug-2017	520 [#1]	---	< 0.010	< 0.010	33 [#1]	0.010	0.012 [#1]	< 0.020	< 0.000020	< 0.0010	< 0.00020	29 [#1]	< 0.00020	---	0.0030	0.0027	0.00050	< 0.00010	< 0.00020	0.0062	< 0.0030
BIWS-16-1-4	03-Oct-2016	250 [#1]	7.05	0.020	< 0.010	9.0 [#1]	0.011	0.0020	0.039	0.00015 [#1]	< 0.0010	0.0011	48 [#1]	< 0.00020	---	0.0013	0.070	0.00086	< 0.00010	< 0.00020	0.013	0.027
	15-Aug-2017	180 [#1]	---	< 0.050	< 0.050	14 [#1]	0.0056	0.0022	< 0.020	< 0.000020	< 0.0010	0.0014	69 [#1]	< 0.00020	---	0.00068	0.035	0.00056	< 0.00010	< 0.00020	0.0093	0.020

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Total Metals

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Total Metals														
		Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIS6-17-SW01	27-Sep-2017	0.043	0.00087	< 0.020	< 0.000020	< 0.0010	0.00033	0.16	< 0.00020	0.00030	0.00087	< 0.00020	< 0.00010	< 0.00020	0.00012	0.0045
BI SW01	21-Aug-2011	0.016	0.0043	< 0.02	0.000009	< 0.001	0.0004	0.26	< 0.0002	< 0.0002	0.0013	< 0.0002	< 0.0001	< 0.0002	< 0.0001	0.005
(Duplicate)	21-Aug-2011	0.004	0.0040	< 0.02	< 0.000005	< 0.001	0.0003	0.06	< 0.0002	< 0.0002	0.0011	< 0.0002	< 0.0001	< 0.0002	< 0.0001	0.006
	16-Aug-2012	0.0098	0.0018	< 0.020	< 0.000025	< 0.0010	0.00038	**2.0** [#1]	< 0.00020	< 0.00020	0.0016	0.00027	< 0.00010	< 0.00020	0.00016	0.014
(Duplicate)	16-Aug-2012	0.014	0.0021	< 0.020	< 0.000025	< 0.0010	0.00052	**3.9** [#1]	< 0.00020	< 0.00020	0.0019	0.00028	< 0.00010	< 0.00020	< 0.00010	0.014
	23-Aug-2013	0.022	0.0013	< 0.020	< 0.000025	< 0.0010	0.00021	**1.1** [#1]	< 0.00020	< 0.00020	0.0013	0.00026	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	23-Aug-2013	0.020	0.0013	< 0.020	< 0.000025	< 0.0010	< 0.00020	**0.95** [#1]	< 0.00020	< 0.00020	0.0012	0.00024	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	03-Aug-2014	0.025	0.00099	< 0.020	< 0.000020	< 0.0010	0.00049	**1.7** [#1]	< 0.00020	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0042
(Duplicate)	03-Aug-2014	0.032	0.0014	< 0.020	< 0.000020	< 0.0010	0.00055	**3.1** [#1]	< 0.00020	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0056
	08-Aug-2015	0.013	0.0012	< 0.020	< 0.000020	< 0.0010	0.00025	**1.8** [#1]	< 0.00020	< 0.00020	0.0012	0.00024	< 0.00010	< 0.00020	< 0.00010	< 0.0030
(Duplicate)	08-Aug-2015	0.015	0.0013	< 0.020	< 0.000020	< 0.0010	0.00031	**1.8** [#1]	< 0.00020	< 0.00020	0.0011	0.00026	< 0.00010	< 0.00020	< 0.00010	< 0.0030
BI SW02	18-Aug-2008	0.026	< 0.001	< 0.02	< 0.00001	< 0.001	0.0003	0.24	< 0.0002	0.0011	0.0019	< 0.001	< 0.0001	< 0.0002	0.0007	**0.064** [#1]
	18-Aug-2009	0.031	0.0009	< 0.02	0.000009	< 0.001	0.0008	0.17	< 0.0002	0.0007	0.0020	< 0.0002	< 0.0001	< 0.0002	0.0005	0.003
	23-Aug-2010	0.001	0.0006	< 0.02	< 0.000005	< 0.001	0.0004	< 0.06	< 0.0002	0.0008	0.0008	< 0.0002	< 0.0001	< 0.0002	0.0005	< 0.003
	21-Aug-2011	0.002	0.0044	< 0.02	< 0.000005	< 0.001	< 0.0002	< 0.06	< 0.0002	0.0004	0.0013	< 0.0002	< 0.0001	< 0.0002	0.0003	0.003
	15-Aug-2012	0.0071	0.0014	< 0.020	< 0.000025	< 0.0010	0.00021	< 0.060	< 0.00020	< 0.00020	0.00059	< 0.00020	< 0.00010	< 0.00020	0.00011	0.0038
BI SW03	18-Aug-2008	**0.42** [#1]	0.002	< 0.02	0.00003	0.001	0.0013	**1.3** [#1]	0.0005	< 0.0002	0.0026	< 0.001	< 0.0001	< 0.0002	0.0003	**0.20** [#1]
	18-Aug-2009	0.019	0.0020	< 0.02	0.000011	< 0.001	0.0006	**4.4** [#1]	< 0.0002	0.0006	0.0050	< 0.0002	< 0.0001	< 0.0002	0.0013	< 0.003
	23-Aug-2010	0.002	0.0009	< 0.02	0.000009	< 0.001	0.0008	< 0.06	0.0008	0.0003	0.0011	< 0.0002	< 0.0001	< 0.0002	0.0003	< 0.003
	21-Aug-2011	0.003	**0.0092** [#1]	< 0.02	0.000011	< 0.001	0.0010	0.14	< 0.0002	0.0004	0.0039	0.0003	< 0.0001	< 0.0002	0.0005	0.006
	16-Aug-2012	< 0.010	0.0018	< 0.020	< 0.000025	< 0.0010	0.00032	**5.3** [#1]	< 0.00020	0.0029	0.0054	0.00043	< 0.00010	< 0.00020	0.011	0.0045
BI SW04	18-Aug-2008	**2.9** [#1]	0.005 [#1]	< 0.02	**0.00018** [#1]	0.005	**0.0062** [#1]	**5.7** [#1]	0.0031	0.0006	0.0097	< 0.001	< 0.0001	< 0.0002	0.0006	**0.049** [#1]
	18-Aug-2009	0.013	0.0012	< 0.02	< 0.000005	< 0.001	0.0004	0.16	< 0.0002	0.0002	0.0027	< 0.0002	< 0.0001	< 0.0002	0.0003	< 0.003
	23-Aug-2010	0.002	0.0009	< 0.02	0.000006	< 0.001	0.0004	< 0.06	< 0.0002	< 0.0002	0.0011	< 0.0002	< 0.0001	< 0.0002	0.0002	< 0.003
	21-Aug-2011	0.005	0.0048	< 0.02	0.000006	< 0.001	0.0003	0.09	< 0.0002	< 0.0002	0.0014	< 0.0002	< 0.0001	< 0.0002	0.0001	0.004
	16-Aug-2012	0.011	0.0015	< 0.020	< 0.000025	< 0.0010	0.00030	0.15	< 0.00020	< 0.00020	0.00069	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.0041

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Total Metals

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	Total Metals: Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BI SW05	16-Aug-2012	0.089	0.0041	< 0.020	0.000047	< 0.0010	0.0017	**9.1 [#1]**	0.00027	0.0041	0.011	0.00050	< 0.00010	< 0.00020	0.0027	0.013
	03-Aug-2014	0.020	0.0014	< 0.020	0.000021	< 0.0010	0.0012	0.24	< 0.00020	0.0042	0.0018	< 0.00020	< 0.00010	< 0.00020	0.0038	0.0074
	09-Aug-2015	0.0074	0.0013	< 0.020	0.000034	< 0.0010	0.00041	0.067	< 0.00020	0.00040	0.0013	< 0.00020	< 0.00010	< 0.00020	0.0010	< 0.0030
	10-Aug-2016	0.0060	0.00074	< 0.020	< 0.000020	< 0.0010	< 0.00020	0.090	< 0.00020	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
	11-Aug-2017	0.0062	0.0014	< 0.020	0.000030	< 0.0010	< 0.00020	0.18	< 0.00020	< 0.00020	0.00052	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
BI SW06	23-Aug-2010	0.021	0.0008	< 0.02	0.000015	< 0.001	0.0006	0.26	< 0.0002	0.0005	0.0023	< 0.0002	< 0.0001	< 0.0002	0.0003	0.005
	21-Aug-2011	0.036	0.0037	< 0.02	0.000039	< 0.001	0.0005	0.23	< 0.0002	0.0003	0.0029	< 0.0002	< 0.0001	< 0.0002	0.0003	0.008
	16-Aug-2012	0.10 [#1]	0.0034	< 0.020	< 0.000025	< 0.0010	0.00085	**1.3 [#1]**	0.00021	0.00054	0.0037	0.00024	< 0.00010	< 0.00020	0.00028	0.0088
	03-Aug-2014	0.012	0.00092	< 0.020	< 0.000020	< 0.0010	0.00070	0.082	< 0.00020	< 0.00020	< 0.00050	< 0.00020	< 0.00010	< 0.00020	0.00014	0.0052
	09-Aug-2015	0.046	0.0011	< 0.020	0.000028	< 0.0010	0.00043	**0.66 [#1]**	< 0.00020	0.00029	0.0012	< 0.00020	< 0.00010	< 0.00020	< 0.00010	< 0.0030
BI SW-13-1	19-Sep-2013	0.020	0.00054	< 0.020	< 0.000025	< 0.0010	0.00083	0.072	0.0010	0.00082	0.0013	< 0.00020	< 0.00010	< 0.00020	0.00021	< 0.0030
	04-Aug-2014	0.027	0.00095	< 0.020	< 0.000020	< 0.0010	0.0010	0.13	< 0.00020	0.00056	0.0010	< 0.00020	< 0.00010	< 0.00020	0.00014	0.015
	07-Aug-2015	**0.34 [#1]**	0.0011	< 0.020	0.000062	< 0.0010	0.0013	**1.1 [#1]**	0.00050	0.00069	0.0025	< 0.00020	< 0.00010	< 0.00020	0.00021	0.0061
	11-Aug-2016	0.037	0.0011	< 0.020	< 0.000020	< 0.0010	0.00054	**0.38 [#1]**	< 0.00020	0.00049	0.0015	< 0.00020	< 0.00010	< 0.00020	0.00015	< 0.0030
	14-Aug-2017	**0.26 [#1]**	0.0039	< 0.020	0.000048	< 0.0010	0.00034	**7.5 [#1]**	0.00048	0.00065	0.0021	< 0.00020	< 0.00010	< 0.00020	0.00024	0.0049
BI-13-11	19-Sep-2013	0.011	0.00067	< 0.020	< 0.000025	< 0.0010	0.00032	0.062	< 0.00020	0.00061	0.0011	< 0.00020	< 0.00010	< 0.00020	0.00024	0.0031
	03-Aug-2014	**0.18 [#1]**	0.0015	< 0.020	0.000020	< 0.0010	0.0012	**0.83 [#1]**	0.00046	0.00025	0.0022	< 0.00020	< 0.00010	< 0.00020	< 0.00010	0.014
	09-Aug-2015	0.039	0.0010	< 0.020	0.000020	< 0.0010	0.00040	0.15	< 0.00020	0.00032	0.0011	< 0.00020	< 0.00010	< 0.00020	0.00012	< 0.0030
	10-Aug-2016	0.037	0.0016	< 0.020	< 0.000020	< 0.0010	0.00053	0.29	< 0.00020	0.00051	0.0028	< 0.00020	< 0.00010	< 0.00020	0.00022	0.012
	14-Aug-2017	**8.3 [#1]**	**0.0073 [#1]**	0.28	**0.00049 [#1]**	**0.013 [#1]**	**0.0094 [#1]**	**76 [#1]**	**0.0080 [#1]**	0.0016	0.093	**0.0017 [#1]**	< 0.00010	< 0.00020	0.00085	**0.34 [#1]**
BI-13-12	19-Sep-2013	0.091	0.0012	< 0.020	< 0.000025	< 0.0010	0.00048	**0.52 [#1]**	< 0.00020	0.00059	0.0017	< 0.00020	< 0.00010	< 0.00020	0.00025	0.0057
BIS 97-1-3	15-Jul-1997	**0.33 [#1]**	**< 0.04 [#1]**	< 0.04	**< 0.002 [#1]**	**0.009 [#1]**	< 0.002	**35.4 [#1]**	**< 0.03 [#1]**	< 0.004	0.02	**< 0.03 [#1]**	**< 0.03 [#1]**	**< 0.03 [#1]**	---	0.01
BIS 97-3-5	15-Jul-1997	**0.24 [#1]**	**< 0.04 [#1]**	< 0.04	**< 0.002 [#1]**	**0.010 [#1]**	0.004 [#1]	**17.8 [#1]**	**< 0.03 [#1]**	< 0.004	0.04	**< 0.03 [#1]**	**< 0.03 [#1]**	**< 0.03 [#1]**	---	0.01

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
BIS6-17-SW01	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI SW01	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	23-Aug-2013	< 0.00040	0.00052	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2013	< 0.00040	0.00056	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI SW02	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI SW03	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI SW04	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI SW05	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI SW06	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	25-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI 08-1-4	21-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	15-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI 08-2-3	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	23-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI 08-3-2	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	25-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI 08-6-4	18-Aug-2008	0.17	**0.012** [#1]	0.018	0.013	0.25	0.7	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	0.0084	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	0.18	< 0.00040	0.0030	< 0.00080	< 0.1	0.11	---	---	---	---	---	---	---	---	---
BI 08-7-2	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	0.0005	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	0.00043	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI 08-8-4	16-Aug-2012	0.024	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.29	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2012	0.02	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.30	---	---	---	---	---	---	---	---	---
	03-Aug-2014	0.043	0.00080	0.00089	0.0054	< 0.1	0.23	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Aug-2014	0.017	< 0.00040	< 0.00040	0.0022	< 0.1	0.31	---	---	---	---	---	---	---	---	---
	08-Aug-2015	0.031	< 0.00040	0.00048	< 0.00080	< 0.1	0.16	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2015	0.031	< 0.00040	0.00050	< 0.00080	< 0.1	0.16	---	---	---	---	---	---	---	---	---
	08-Aug-2016	0.031	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.33	---	---	---	---	---	---	---	---	---
(Duplicate)	08-Aug-2016	0.033	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.46	---	---	---	---	---	---	---	---	---
	11-Aug-2017	0.052	0.00050	0.0015	0.0075	< 0.10	0.46	---	---	---	---	---	---	---	---	---
(Duplicate)	11-Aug-2017	0.051	0.00048	0.0015	0.0074	< 0.10	0.49	---	---	---	---	---	---	---	---	---
BI DP 08-4	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---
BI DP 08-5	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI SW-13-1	19-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	14-Aug-2017	< 0.00040	0.0014	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI-13-1-4	19-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
BI-13-11	19-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	14-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI-13-12	19-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI-13-2-4.5	19-Sep-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI-13-3-4.5	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	07-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2016	0.00042	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
	22-Nov-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI-13-5-2	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI-13-6-2	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI-14-10-3	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI-14-8-3	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BI-14-9-3	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.15	---	---	---	---	---	---	---	---	---
	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	0.39	---	---	---	---	---	---	---	---	---
BIS 02-4-5	22-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	24-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
BIS 97-1-3	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	22-Nov-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIS 97-2-4	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
(Duplicate)	19-Aug-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	23-Aug-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
BIS 97-3-5	22-Aug-2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	24-Aug-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	21-Aug-2006	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	19-Aug-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	18-Aug-2008	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
BIS-10-3-DP	29-Sep-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---
	24-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIS-10-4-DP	29-Sep-2010	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	---	---	---	---	---	---	---	---	---	---
	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	---	---	---	---	---	---	---	---	---	---
	24-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIS-10-2-3	21-Aug-2011	0.048	**0.081** [#1]	0.031	0.42	0.64	50	---	---	---	---	---	---	---	---	---
	16-Aug-2012	0.024	**0.015** [#1]	0.015	0.095	0.2	33	---	---	---	---	---	---	---	---	---
	25-Aug-2013	0.084	**0.089** [#1]	0.05	0.29	0.23	3.5	---	---	---	---	---	---	---	---	---
	03-Aug-2014	0.071	**0.11** [#1]	**0.11** [#1]	0.64	1.1	110	---	---	---	---	---	---	---	---	---
	08-Aug-2015	0.0049	**0.0044** [#1]	0.0041	0.024	0.15	24	---	---	---	---	---	---	---	---	---
BIS-10-1-3	21-Aug-2011	**0.58** [#1]	**0.16** [#1]	0.034	0.16	2.6	24	---	---	---	---	---	---	---	---	---
	16-Aug-2012	**0.64** [#1]	**0.22** [#1]	0.047	0.18	0.58	32	---	---	---	---	---	---	---	---	---
(Duplicate)	16-Aug-2012	**0.63** [#1]	**0.2** [#1]	0.046	0.17	0.69	38	---	---	---	---	---	---	---	---	---
	25-Aug-2013	**0.72** [#1]	**0.43** [#1]	0.054	0.24	0.5	22	---	---	---	---	---	---	---	---	---
(Duplicate)	25-Aug-2013	**0.73** [#1]	**0.44** [#1]	0.055	0.25	0.67	14	---	---	---	---	---	---	---	---	---
	03-Aug-2014	**0.38** [#1]	**0.17** [#1]	0.028	0.16	0.22	32	---	---	---	---	---	---	---	---	---
(Duplicate)	03-Aug-2014	**0.42** [#1]	**0.18** [#1]	0.037	0.18	0.33	39	---	---	---	---	---	---	---	---	---
	09-Aug-2015	**0.68** [#1]	**0.7** [#1]	**0.12** [#1]	0.65	1.8	420	---	---	---	---	---	---	---	---	---
(Duplicate)	09-Aug-2015	**0.62** [#1]	**0.66** [#1]	**0.14** [#1]	0.78	9.6	870	---	---	---	---	---	---	---	---	---
BIS-10-3-3	21-Aug-2011	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	---	---	---	---	---	---	---	---	---
	15-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	24-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	03-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIS-16-1-3	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
(Duplicate)	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIS-16-7-5	08-Aug-2016	**14** [#1]	**5.1** [#1]	**0.5** [#1]	2	< 0.1	0.43	---	---	---	---	---	---	---	---	---
	11-Aug-2017	**5.6** [#1]	**1.5** [#1]	**0.34** [#1]	1.4	2.4	0.39	---	---	---	---	---	---	---	---	---
BIS-16-8-3	08-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIS-16-10-4	11-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIS-16-11-4	10-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	11-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-300

Monitoring Station	Date (dd-mmm-yyyy)	PHC: Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^6-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	PAH: Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
BIS-16-12-5	08-Aug-2016	**5.3 [#1]**	**3.5 [#1]**	**0.45 [#1]**	1.9	< 0.1	0.50	---	---	---	---	---	---	---	---	---
	11-Aug-2017	**3.2 [#1]**	**0.0093 [#1]**	**0.35 [#1]**	0.39	1.9	0.52	---	---	---	---	---	---	---	---	---
BIWS-16-1-4	03-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
	15-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Appendix 11 Conceptual Site Model: Bear Island Flare Pit



Imperial

Conceptual Site Model

Bear Island Flare Pit (APEC BI-10), Norman Wells, NT

31 May 2018

407011-00622 – CA-REP-0005

Advisian
Suite 500, 151 Canada Olympic Rd SW
Calgary, AB T3B 6B7 CANADA
Phone: +1 403 247 0200
Facsimile: +1 403 247 4811
www.advisian.com

© Copyright 2018 WorleyParsons Canada Services Ltd.

Advisian
WorleyParsons Group

THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE

These documents and the information contained therein are confidential, property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial and territorial freedom of information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch.II"1", and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch.I"1", as such legislation may be amended from time to time.

Project No. 407011-00622-CA-REP-0005 - Conceptual Site Model: Bear Island Flare Pit (APEC BI-10), Norman Wells, NT

Rev	Description	Originator Approval	Reviewer Approval	Project Manager Approval	Date
0	Issued as final	A. Haigh	M. Brown	S. Gibb	31-May-18

Contents

1. Conceptual Site Model Summary 1

Figures

Figure 1 Site Location Map

Figure 2 Historical Air Photo 1979

Figure 3 Site Plan Showing Topography

Figure 4A Site Plan Showing Sampling Locations

Figure 4B Excavation Site Plan Showing Sampling Locations

Figure 5A Site Plan 3-D Visualization

Figure 5B Cross Section A-A' (North to South)

Figure 6A Soil Analytical Results: Inorganic Parameters

Figure 6B Soil Analytical Results: Organic Parameters

Figure 6C Excavation Soil Analytical Results: Organic Parameters

Figure 7A Groundwater and Surface Water Analytical Results: Inorganic Parameters

Figure 7B Groundwater and Surface Water Analytical Results: Organic Parameters

Figure 8 Conceptual Site Model

Figure 9 Conceptual Exposure Model, Current Land Use and Site Conditions

Tables

Table 1 Soil Analytical Results: Inorganic Parameters

Table 2 Soil Analytical Results: Organic Parameters

Table 3 Water Analytical Results: Inorganic Parameters

Table 4 Water Analytical Results: Total Metals

Table 5 Water Analytical Results: Organic Parameters

1. Conceptual Site Model Summary

Site Description

LAND USE	
Site Description:	Situated to the North of the former Bear Island Battery and current N-pad injection wells N-42X, N-40X, M-42X, M-39X. Access Road to the West of the site (Figures 1 and 2).
Current Land Use:	CCME Industrial land use.
Future Land Use:	CCME Parkland land use.
HISTORICAL LAND USE	
Infrastructure type:	Flare pit, possible former drilling pad (Figure 2).
Notes:	Used for disposal/combustion of fluids/gases from Battery (petroleum hydrocarbons [PHCs], polycyclic aromatic hydrocarbons [PAHs]), and buried metal debris.
Years Active:	From air photos, interpreted as pre-1979 to 1993 (Figure 2)
SITE SETTING	
Topography and Drainage:	Steep slope at south end of site, rising up to N-Pad and former Bear Island Battery (Figures 2, 3, 5A). Remainder of site is generally flat, then slopes north (down) to an unnamed creek. Site is subject to ice scouring and flooding during Mackenzie River spring breakup.
Nearby Surface Water Bodies (Distance and Direction):	Unnamed Creek flows North along the East side of the site (approximately 35 m to the East of the former flare pit), then roughly Northwest (approximately 20 m to the North of the former flare pit at closest point) to join with the Mackenzie River (~180 m North of the former flare pit).
SOIL AND GROUNDWATER CONDITIONS	
Surficial Materials:	Silty clay, sandy silt (Figures 5A/B).
Depth to Permafrost:	0.6 to 1.5 mbgs, discontinuous.
Depth to Bedrock:	Not encountered to depth of 9 mbgs investigated.
Bedrock Lithology:	Not encountered.
Number of Groundwater-Bearing Zones:	1
Number of Piezometers:	4 current, 3 historical now destroyed/decommissioned.
Free Product in Upper GW-Bearing Zone:	Not encountered.
Free Product in Second GW-Bearing Zone:	NA.
First Groundwater-Bearing Zone	
Primary Soil Type/Lithology:	Unconsolidated silty sand, sand, and/or silt
Dominant Grain Size:	Coarse (assumed porosity n=0.2).
Depth to Groundwater Surface:	~2 metres below top of casing (wells have not been surveyed).

Hydraulic Conductivity (Minimum):	9.9×10^{-6} m/s
Hydraulic Conductivity (Maximum):	3.6×10^{-5} m/s
Hydraulic Conductivity (Geometric Mean K):	1.9×10^{-5} m/s
Vertical Hydraulic Gradient:	Not assessed (underlain by discontinuous permafrost; wells have only been installed in uppermost water bearing zone)
Lateral Hydraulic Gradient (I):	Not assessed (current monitoring network distribution and lack of survey on current wells does not allow for interpretation of hydraulic gradient and/or flow velocity)
Groundwater Flow Direction and Velocity:	Groundwater is inferred to flow north towards the Mackenzie River. Current monitoring does not provide hydraulic gradient data to determine flow velocity.

HISTORICAL ENVIRONMENTAL ACTIVITIES

Soil and groundwater characterization and impact delineation (2011 to present). Locations of soils boreholes, and water monitoring network shown on Figures 4A/B.

Remedial excavation - partially complete (2014) with depth limited by groundwater seepage in base of excavation. Estimated 1174 m^3 of impacted soil removed. Backfilled with sand sourced from Islands 4 and 5. Excavation shown in Figures 4A/B and 6C.

CURRENT STATUS

Remaining soil impacts (Figures 6A-C)

Sources and Impacts

SOURCES

Historical Sources:	Flare Pit (APEC BI-10, Appendix 4). Below-ground utility corridor (still in place) runs North-South to the East of the Flare Pit. Two flare lines from the former Bear Island Battery northward to the flare pit have been abandoned.
Current Sources:	Impacted soil (secondary source). Potential leaks/spills from below-ground utilities running North-South to the East of the former Flare Pit.

KNOWN ENVIRONMENTAL CONCERNS

a. Soil

Potential Contaminants of Concern:	Petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs), metals, salinity.
Proven Contaminants of Concern:	PHCs (F1-F4+). PAHs (fluorene, naphthalene, phenanthrene).

Lateral Delineation:	Lateral delineation of PHCs and PAHs not fully achieved between former flare pit and Unnamed Creek, North of former flare pit. Lateral delineation of PHCs not achieved to the South between former flare line and below-ground utility corridor (BIFP-16-11). Lateral delineation of PHCs and PAHs achieved to the West, NW and SW of the former flare pit (Figures 6A-C).
Vertical Delineation:	Not achieved in excavated area due to soil saturation at depth. Not achieved to the south of the former flare pit, between the former flare line and below-ground utility corridor (BIFP-14-TP1, BIFP-14-TP2, BIFP-14-TP3, BIFP-16-11).

b. Groundwater

Potential Contaminants of Concern:	PHCs, PAHs, metals, phenols, salinity. PHCs (benzene).
Proven Contaminants of Concern:	Metals (at or close to background concentrations) Phenols (unlikely to be facility-related)
Presence of Free Product:	No free phase was observed during recent events.
Lateral Delineation:	Achieved to the North, East and South of identified benzene impact at BIFP-12-1-3; not achieved to the West (Figures 7A/B).
Vertical Delineation:	Only the upper groundwater-bearing zone to approximately 2-3 mbgs is currently instrumented. Permafrost has been observed in a few boreholes at depths between 0.6 and 1.5 mbgs, and may provide a hydraulic barrier underlying the former flare pit issues at depth.

Migration Pathways and Receptors

MIGRATION PATHWAYS

Summarized in Figures 8 and 9.
Potential pathways include leaching from soil to groundwater, lateral migration in groundwater, discharge to surface water, shallow vapour migration in soil, water and wind erosion.

RECEPTORS

Summarized in Figures 8 and 9.
Main receptor of interest is the Unnamed Creek, in relation to human, wildlife and freshwater aquatic life receptors. Plants and soil invertebrates may also be receptors in the rooting zone of shallow soils.

EXPOSURE PATHWAYS

Summarized in Figures 8 and 9.

Synopsis of Conceptual Risk

In terms of soil-related exposure pathways, the remedial excavation has removed most PHC impacted source soils underlying the former flare pit footprint, to depths up to a maximum of 4.0 m (Figure 6C). Due to physical obstacles to further excavation including the high water table and adjacent surface water bodies, some residual soil impacts exceeding PHC guidelines remain in place. Risks related to potential exposure pathways for human, ecological, microbial and wildlife direct contact or ingestion have been reduced by the excavation and subsequent placement of clean backfill, but not eliminated. The pathway for leaching from soil to groundwater is active, however measured PHC values in groundwater north of the excavation footprint do not exceed applied parkland guidelines.

In terms of groundwater-related exposure pathways, PHC concentrations exceeding the applied guidelines have not been observed. Any PHCs present in groundwater are not believed to have reached the closest surface water body (Unnamed Creek) and associated receptors. The exposure scenario related to groundwater use for drinking water or wildlife watering is considered inactive.

Limitation of Liability, Scope of Report, and Third Party Reliance

This report has been prepared and the work referred to in this report has been undertaken by WorleyParsons for Imperial Oil Limited. It is intended for the sole and exclusive use of Imperial Oil Limited, its affiliated companies and partners and their respective [insurers], agents, employees, and advisors (collectively, "Imperial Oil"). Any use, reliance on or decision made by any person other than Imperial Oil based on this report is the sole responsibility of such other person. Imperial Oil and WorleyParsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by WorleyParsons with respect to this report and any conclusions or recommendations made in this report reflect WorleyParsons' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for the specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

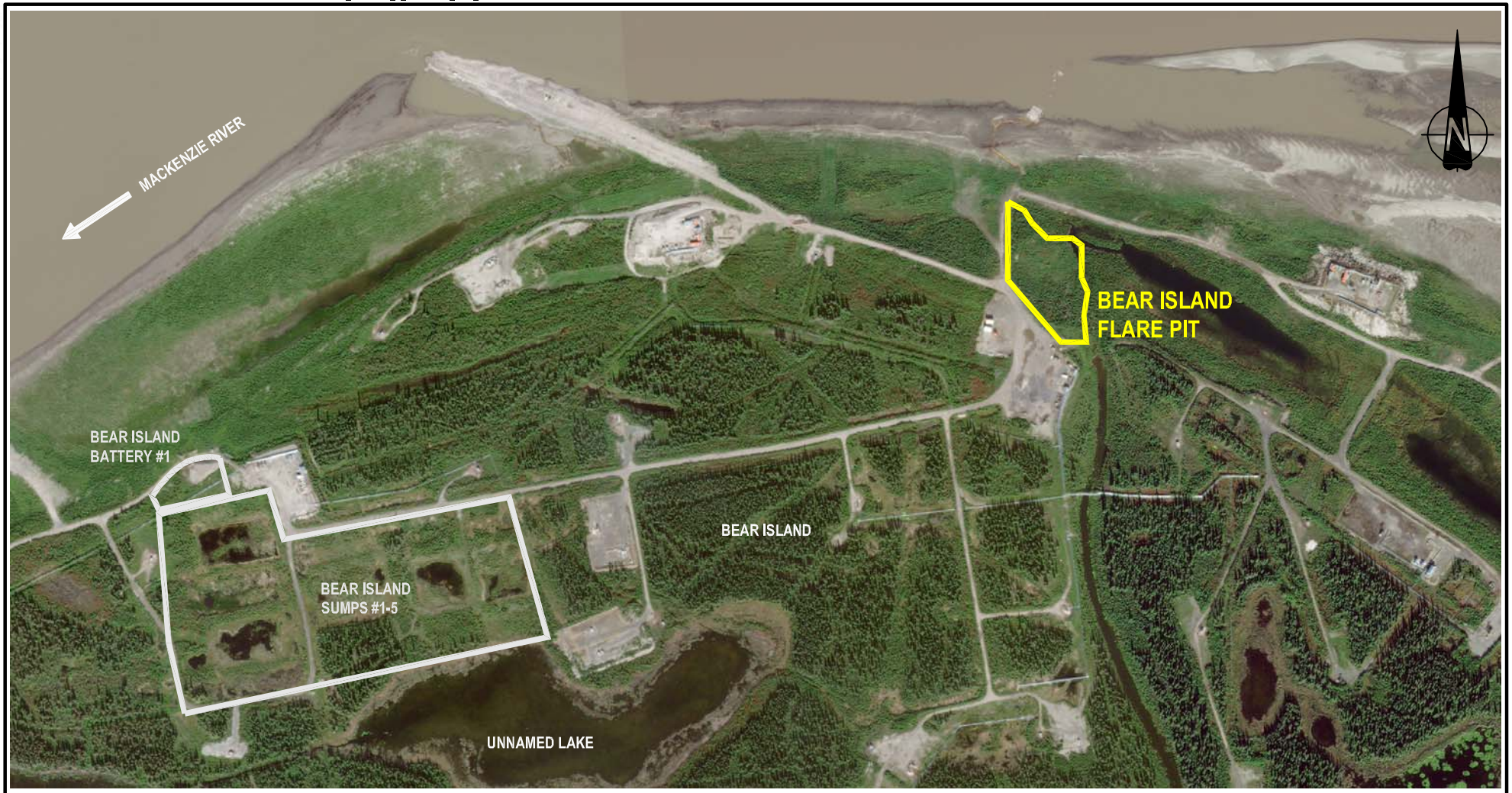
If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

Other than by Imperial Oil, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of WorleyParsons. Nothing in this report is intended to constitute or provide a legal opinion

Figures



FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-SITEAIRPHOTO2017.DWG



AIR PHOTO SOURCE: PLANET LABS GEOMATICS CORP.,
DATE: APRIL 6 AND 30, 2017

3TM NAD27

m 0 100 200 400 m

1:8000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

SITE LOCATION MAP

Date:	07-MAY-18	Drawn by:	BMF	Edited by:	-	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

FIG No: 1

REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 16/5/2018 12:47:55 PM USER NAME: blair.fink
SAVE DATE & TIME: 16/5/2018 12:14:31 PM ISSUING OFFICE: eCAD



m 0 50 100 150 m

1:2500

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

HISTORICAL AIR PHOTO 1979

Date:	Drawn by:	Edited by:	App'd by:
07-MAY-18	BMF	-	MB

Advisian
WorleyParsons Group

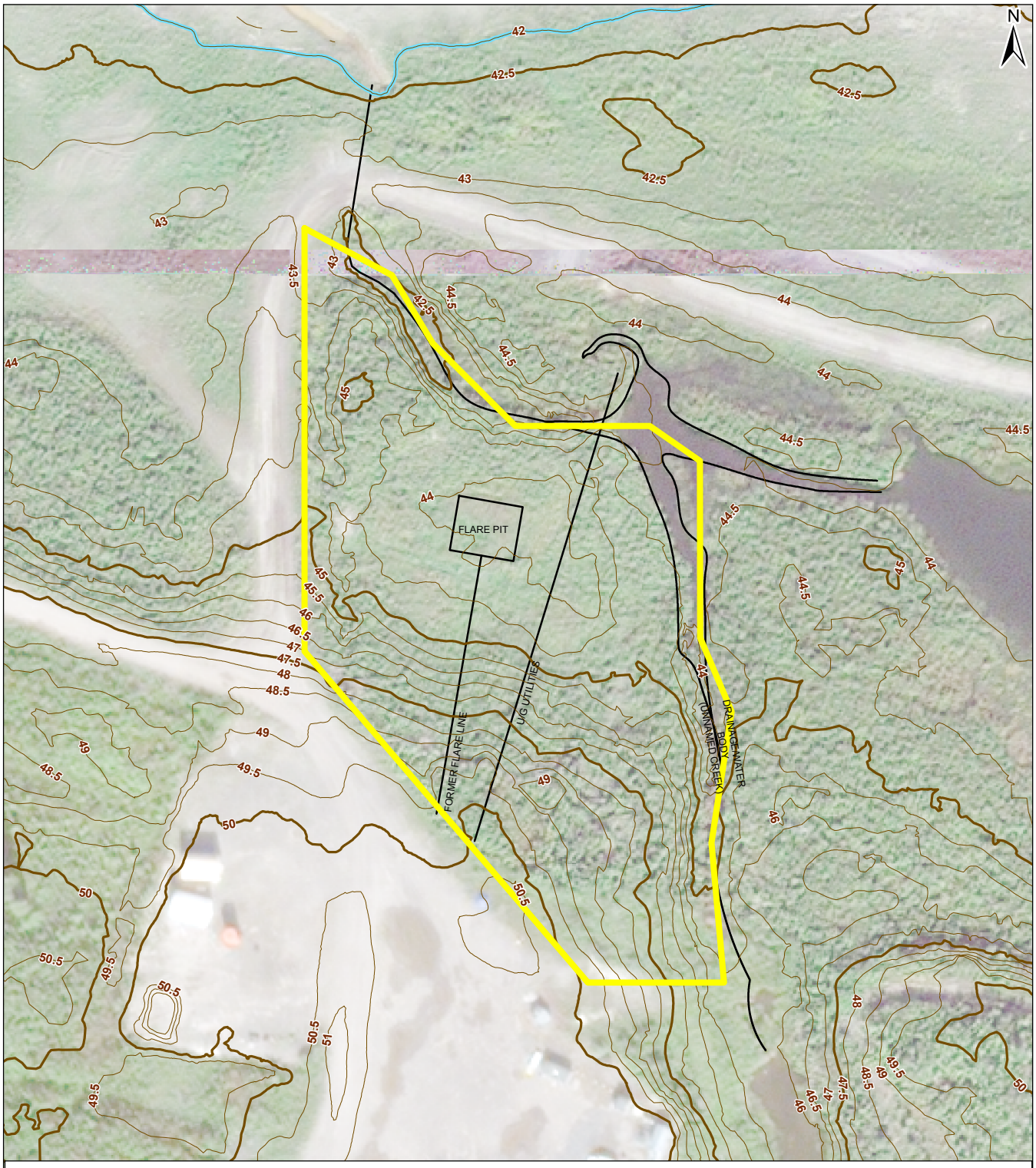
WorleyParsons Project No.
407011-00622-400

FIG No: 2
REV: B

*This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

PLOT DATE & TIME: 17/5/2018 9:53:21 AM
SAVE DATE & TIME: 16/5/2018 1:50:14 PM
USER NAME: blair.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-AIRPHOTO1979.DWG



Mean High Water Elevation of the Mackenzie River
(Generally Corresponding to Lease Boundary/O.W.H.M as per UMA Engineering Ltd. Files 010166101 [Rev 0 dated 95-10-16] and 98100003 [Rev 1 dated 98-10-08])

Site Boundary

Elevation Contour (2.5m interval)

Elevation Contour (0.5m interval)

Source:
Airborne Imaging; 2012

0 25 50
Metres
1:1,500

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

SITE PLAN SHOWING TOPOGRAPHY

Date:	Drawn by:	Edited by:	App'd by:
30-MAY-18	T.G.	T.G.	D.G.

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

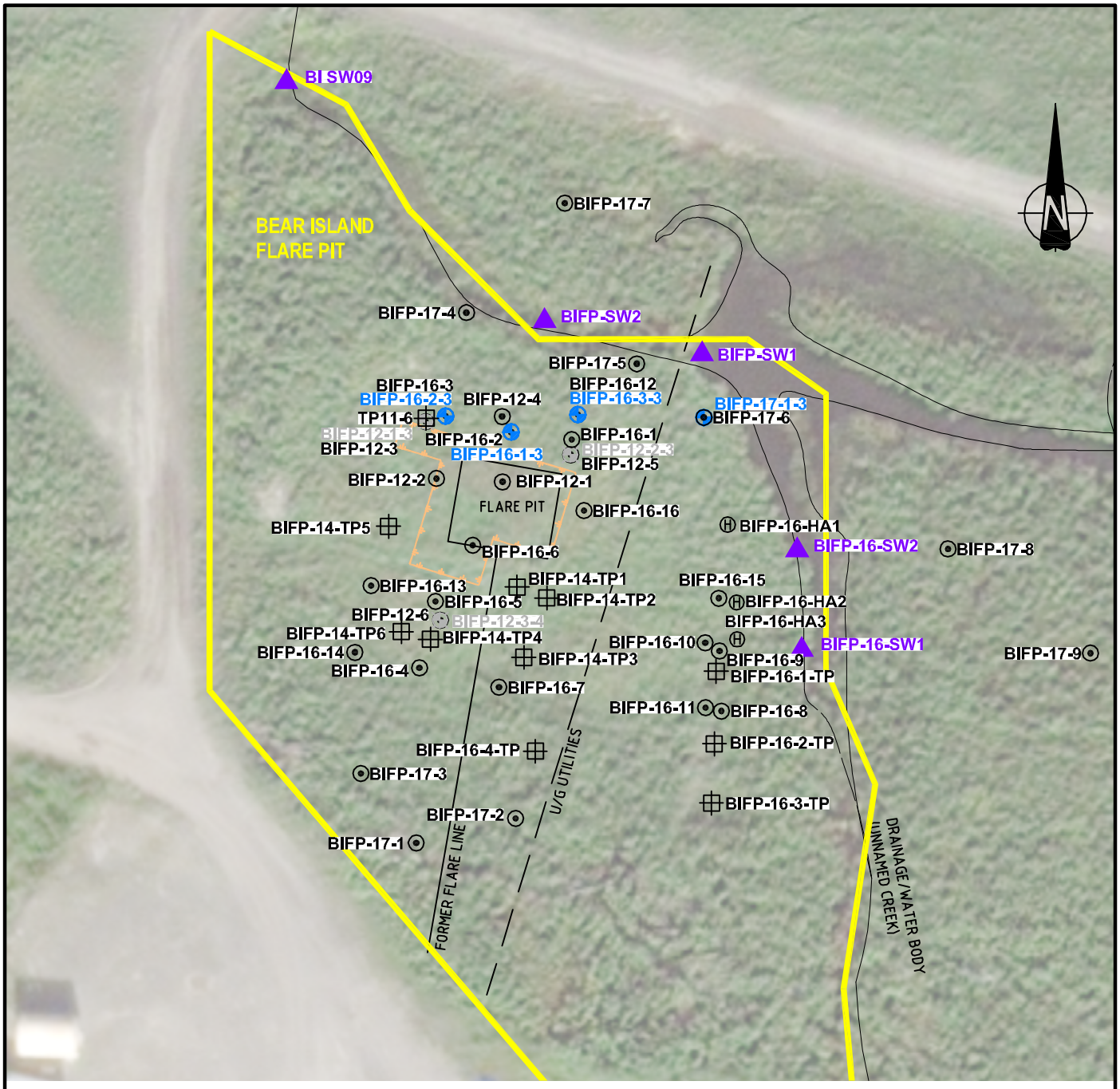
FIG No 3

REV 0

"This drawing is prepared solely for the use of our customers as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: never never
SAVE DATE & TIME: 30/05/2018 1:38:33 PM
USER NAME: Tom.Graham
ISSUING OFFICE: CALGARY GIS

FILE LOCATION: N:\PROJECTS\ImperialOil\NormanWells\MXDs\407011-00622.400\Conceptual Site Model\BIFP\BIFP_Topography_Rev0.mxd



LEGEND

- MONITORING WELL LOCATION
- SOIL SAMPLING LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- TEST PIT LOCATION
- HAND AUGER LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 50 m

1:1000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

SITE PLAN SHOWING SAMPLING LOCATIONS

Date:	03-MAY-18	Drawn by:	OTHERS	Edited by:	BMF	App'd by:	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

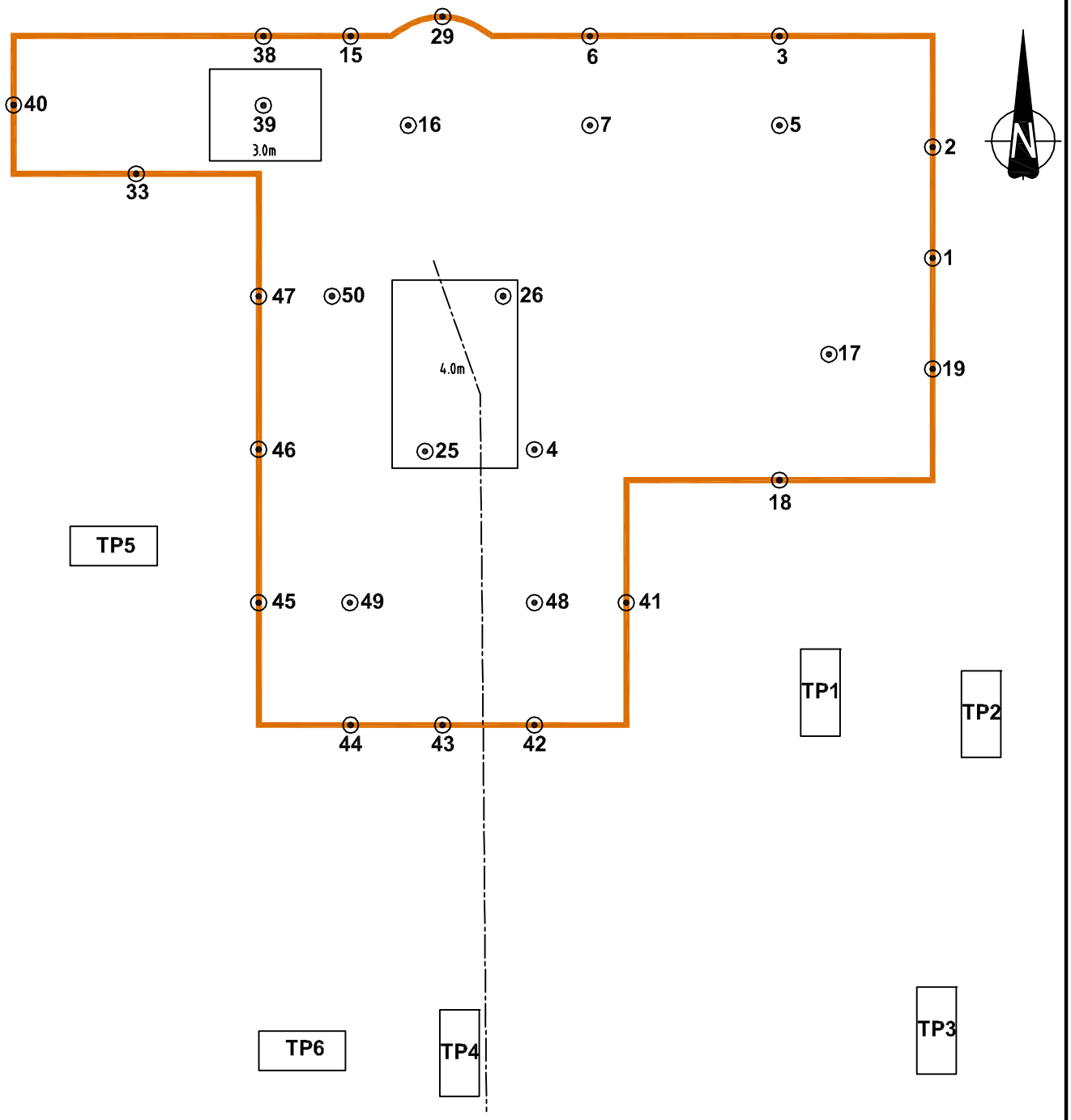
FIG No 4A

REV A

This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.

USER NAME: blair.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 17/5/2018 2:50:50 PM
SAVE DATE & TIME: 17/5/2018 2:47:34 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- BURIED FLARE LINE
- DRAINAGE DITCH
- EXCAVATION OUTLINE
- SOIL SAMPLING LOCATION
- TP — TEST PIT LOCATION

m 0 5 10 m

APPROXIMATELY 1:200

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

EXCAVATION SITE PLAN SHOWING SAMPLING LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
03-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

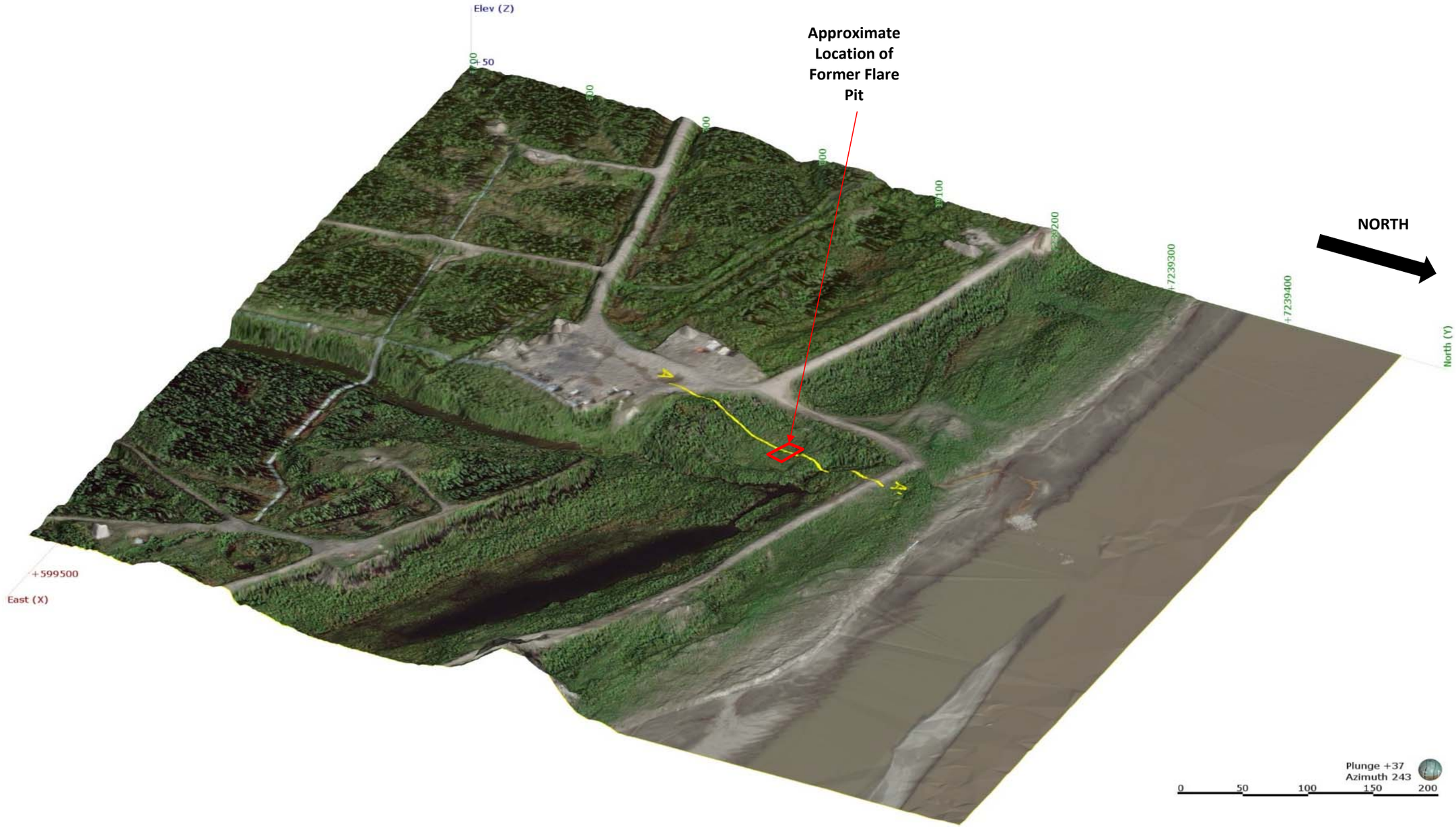
WorleyParsons Project No.
407011-00622-400

FIG No 4B | REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

PLOT DATE & TIME: 15/5/2018 1:24:27 PM
SAVE DATE & TIME: 7/5/2018 10:30:40 AM
USER NAME: blan.fink
ISSUING OFFICE: eCAD

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BIFP_EXCAVATION.DWG



IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

SITE PLAN 3-D VISUALIZATION

Date:	Drawn by:	Edited by:	App'd by:
17-May-18	AM	LG	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622

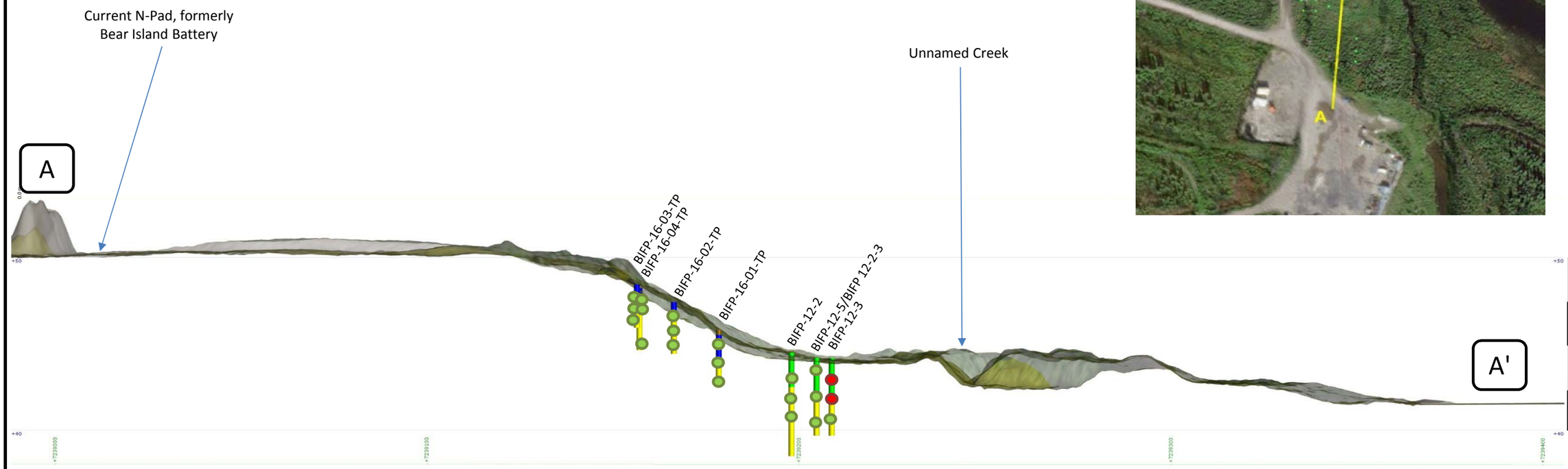
FIG No. 5A

REV A

* This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIFP





Unit

- CLAY
- TOPSOIL/FILL/ORGANICS
- SAND
- SILT

LOCATION WHERE SOIL SAMPLES ANALYZED FOR PETROLEUM HYDROCARBON PARAMETERS MET GUIDELINES, SHOWN IN GREEN

LOCATION WHERE SOIL SAMPLES ANALYZED FOR PETROLEUM HYDROCARBONS HAD ONE OR MORE PARAMETERS EXCEEDED GUIDELINES, SHOWN IN RED

Notes: 1) 5x Vertical Exaggeration.
2) Cross-Section width is 50 m.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

CROSS-SECTION A-A' (SOUTH TO NORTH)

Date:	Drawn by:	Edited by:	App'd by:
17-May-18	AM	LG	MB

OneWay to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.: 407011-00622

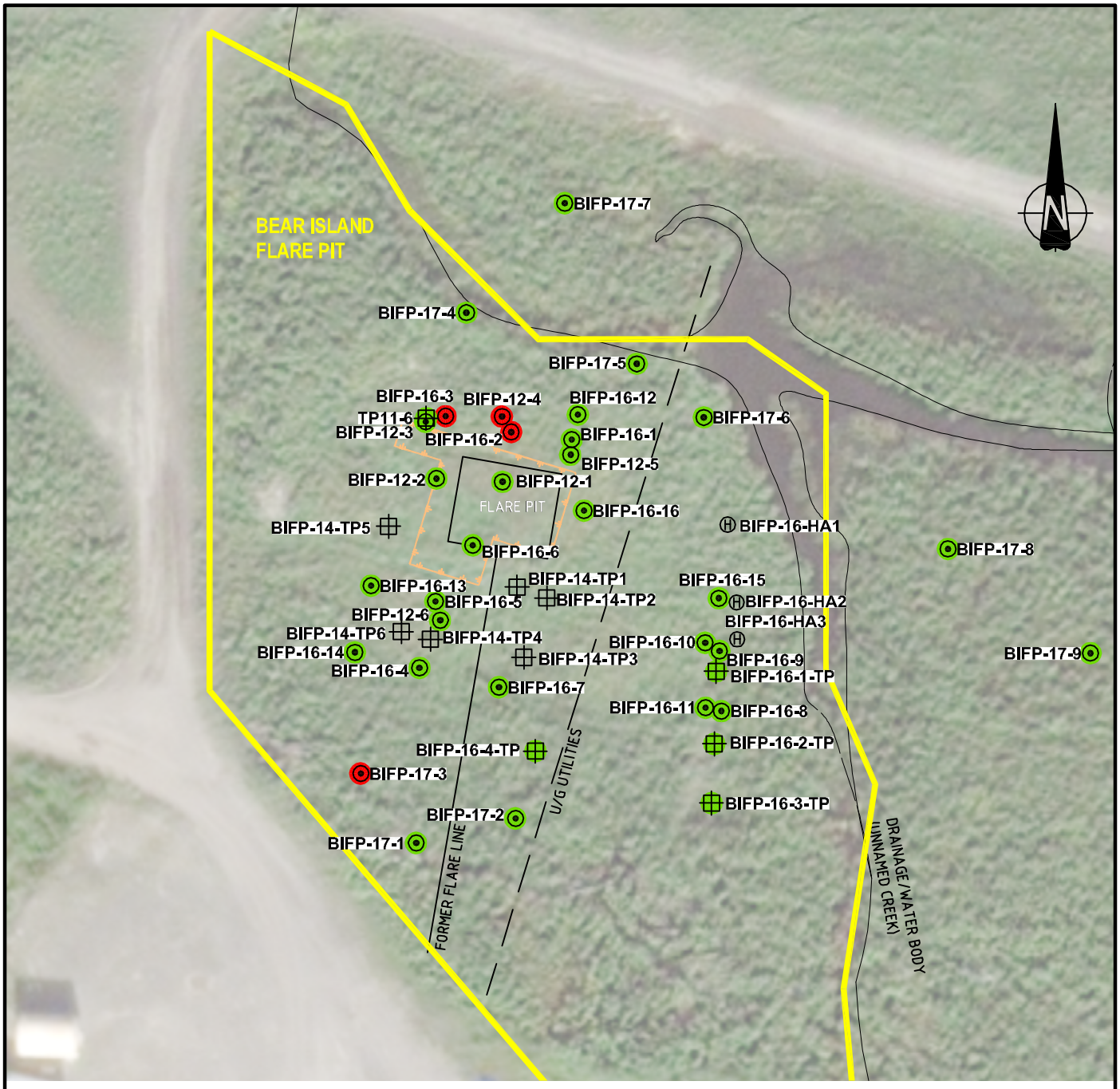
FIG No.: 5B

REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALGBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIFP



LEGEND

- SOIL SAMPLING LOCATION
- TEST PIT LOCATION
- HAND AUGER LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 50 m

1:1000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS: INORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
03-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

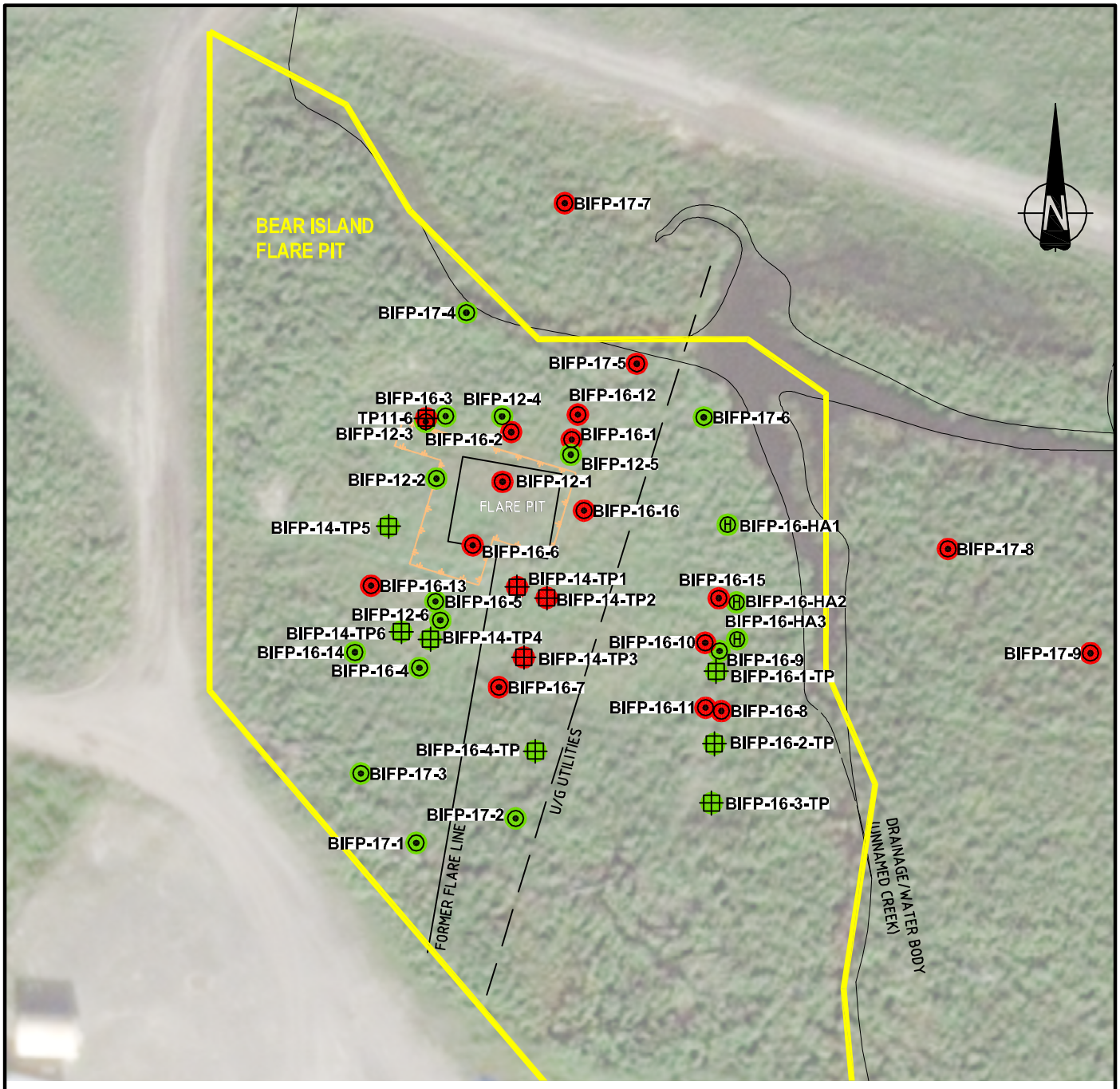
WorleyParsons Project No. 407011-00622-400

FIG No 6A | REV A

This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 17/5/2018 2:53:39 PM
SAVE DATE & TIME: 17/5/2018 2:47:34 PM
USER NAME: blan.fink
ISSUING OFFICE: eCAD



LEGEND

- SOIL SAMPLING LOCATION
- TEST PIT LOCATION
- HAND AUGER LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 50 m

1:1000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

SOIL ANALYTICAL RESULTS: ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
03-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

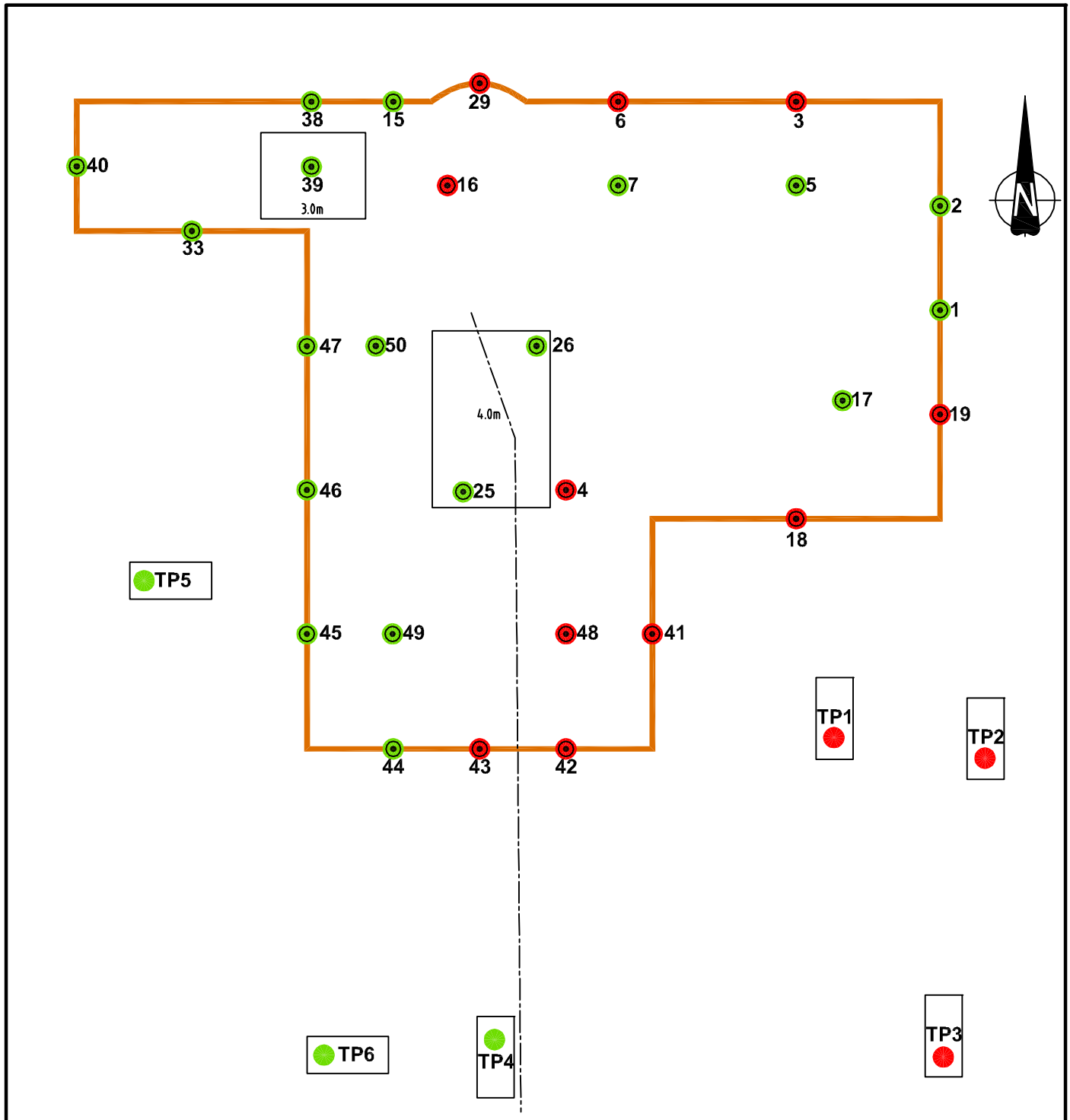
FIG No 6B

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blan.fink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 17/5/2018 2:55:26 PM
SAVE DATE & TIME: 17/5/2018 2:47:34 PM

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG



LEGEND

- BURIED FLARE LINE
- DRAINAGE DITCH
- EXCAVATION OUTLINE
- SOIL SAMPLING LOCATION
- TP — TEST PIT LOCATION

ANALYTICAL RESULTS

- LOCATION WHERE ALL SOIL SAMPLES MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED, SHOWN IN GREEN.
- LOCATION WHERE AT LEAST ONE SOIL SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED, SHOWN IN RED

m 0 5 10 m

APPROXIMATELY 1:200

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

EXCAVATION SOIL ANALYTICAL RESULTS: ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
29-MAY-18	OTHERS	BMF	ME

Advisian
WorleyParsons Group

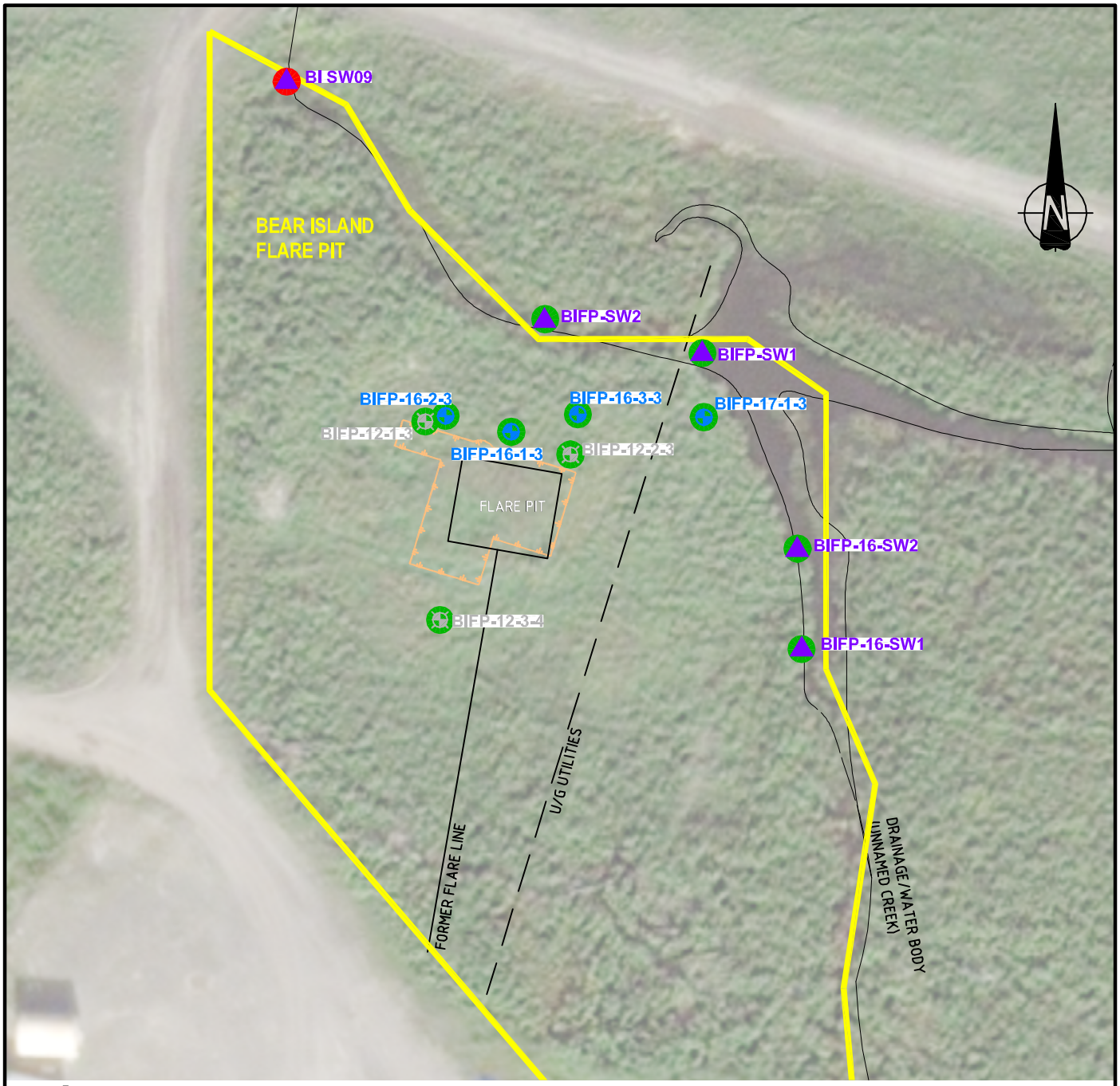
WorleyParsons Project No.
407011-00622-400

FIG No: 6C
REV: B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

USER NAME: blan.tink
ISSUING OFFICE: eCAD
PLOT DATE & TIME: 29/5/2018 8:36:12 AM
SAVE DATE & TIME: 29/5/2018 8:34:59 AM

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-BIFP_EXCAVATION.DWG



LEGEND

- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES AND/OR BACKGROUND FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES AND/OR BACKGROUND FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 50 m

1:1000

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: INORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
03-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

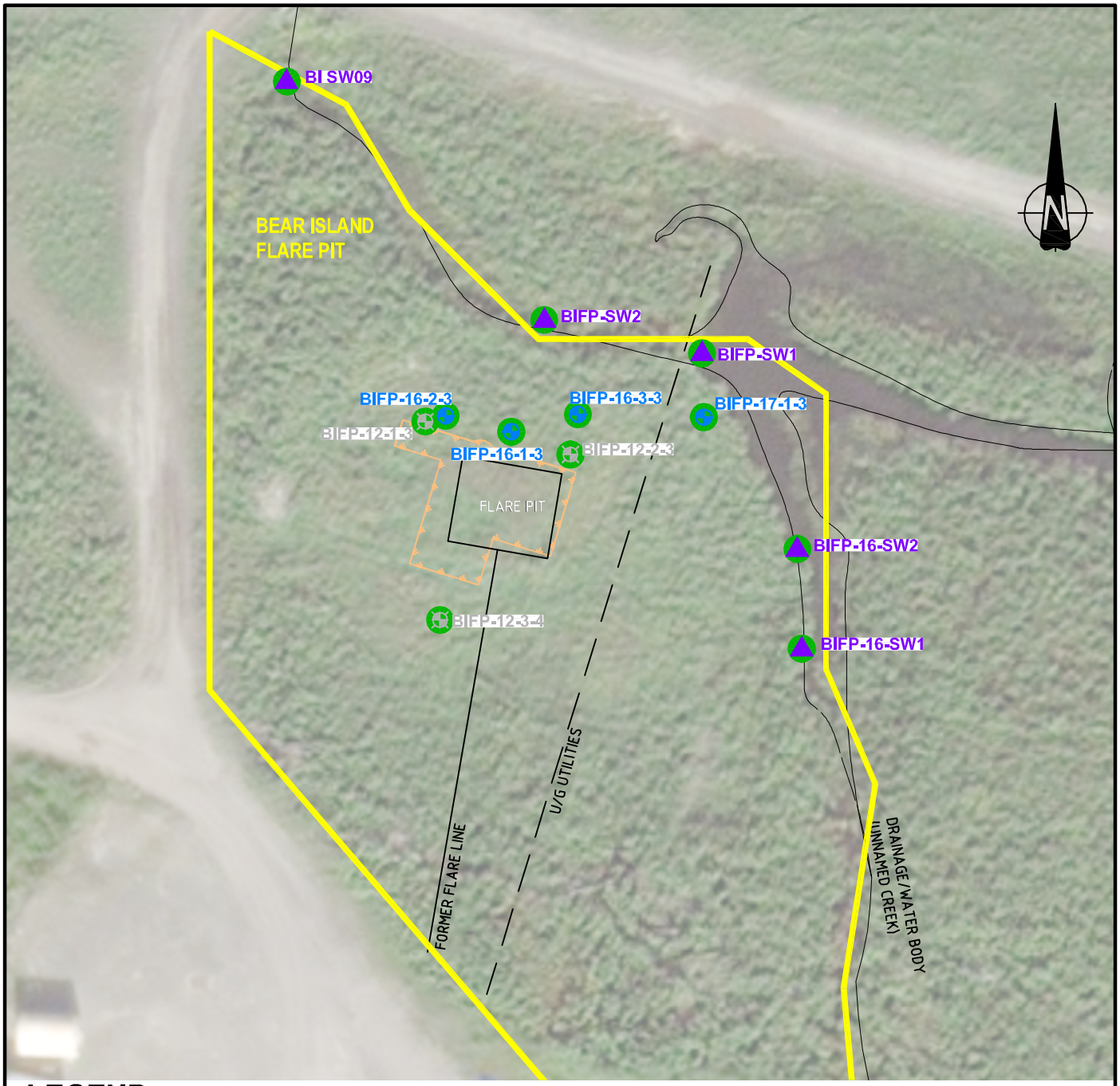
WorleyParsons Project No.
407011-00622-400

FIG No: 7A
REV: A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 18/5/2018 8:50:11 AM
SAVE DATE & TIME: 17/5/2018 2:59:30 PM
USER NAME: blan.fink
ISSUING OFFICE: eCAD



LEGEND

- MONITORING WELL LOCATION
- ABANDONED OR DESTROYED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- APPROXIMATE PERIMETER OF FORMER EXCAVATION

SOURCES:
1. SITE PLAN AS PER UMA ENGINEERING LTD. FILES 010166101 (REV 0 DATED 95-10-16) AND 98100003 (REV 1 DATED 98-10-08)
2. WORLEYPARSONS SURVEY 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017.

m 0 10 20 30 40 50 m

1:1000

ANALYTICAL RESULTS

- LOCATION WHERE GROUNDWATER SAMPLE MET GUIDELINES FOR ALL PARAMETERS THAT WERE ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN GREEN.
- LOCATION WHERE GROUNDWATER SAMPLE EXCEEDED GUIDELINES FOR AT LEAST ONE PARAMETER THAT WAS ANALYZED IN MOST RECENT SAMPLING EVENT, SHOWN IN RED
- LOCATION NOT SAMPLED IN MOST RECENT SAMPLING EVENT

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS: ORGANIC PARAMETERS

Date:	Drawn by:	Edited by:	App'd by:
03-MAY-18	OTHERS	BMF	MB

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622-400

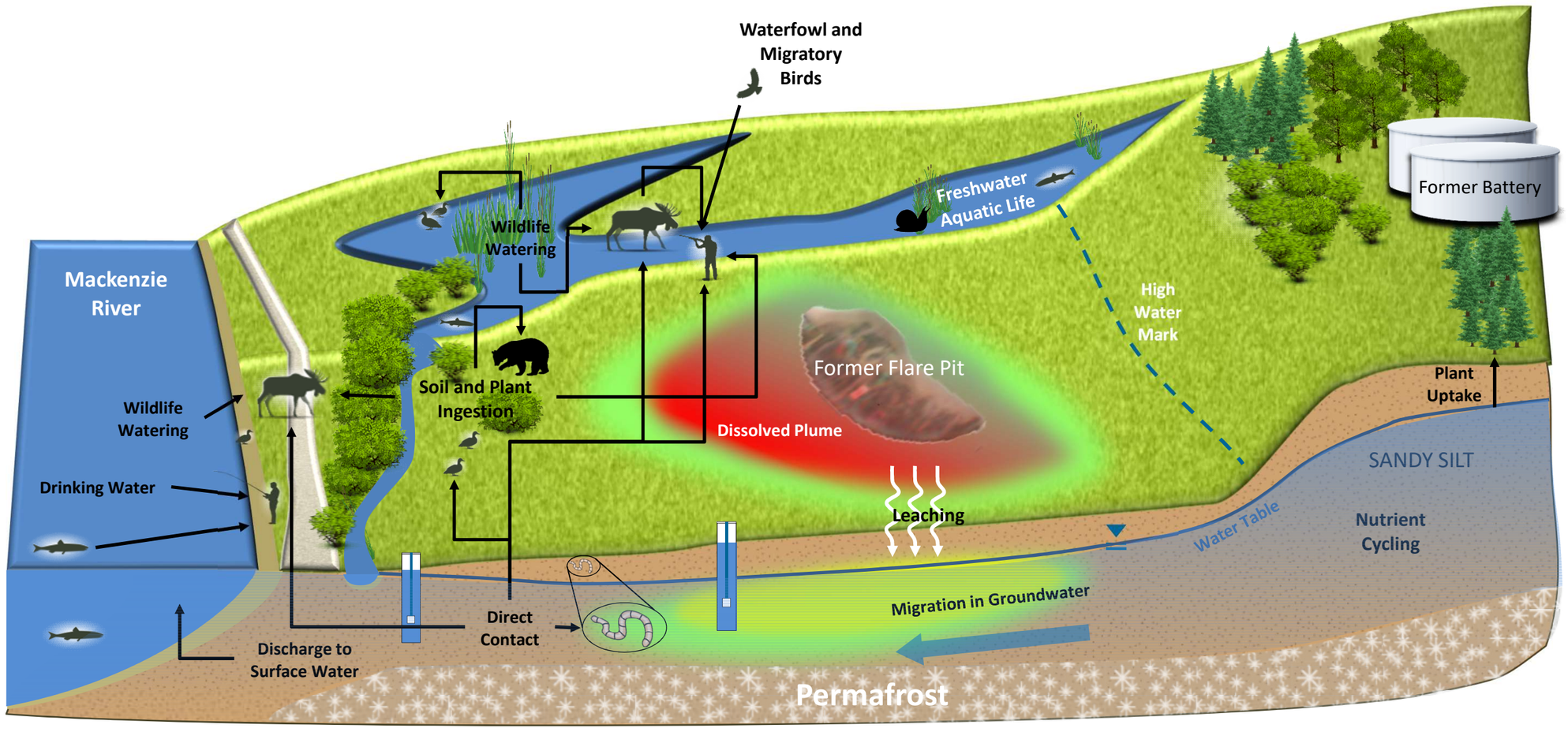
FIG No 7B

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\CAL\GBS\407011-00622\0400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.4_CAD_FILES\00622-400-00-EN-DWG-2018-BEARISLAND.DWG

PLOT DATE & TIME: 18/5/2018 8:55:09 AM
SAVE DATE & TIME: 17/5/2018 2:59:30 PM
USER NAME: blan.fink
ISSUING OFFICE: eCAD



Health Canada, 2015. Conceptual Site Model Builder, Version 1.0. Developed by eSolutions Group Ltd. 2015.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

CONCEPTUAL SITE MODEL

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AH	LG	MB

OneWay™ to zero harm

Advisian
WorleyParsons Group

WorleyParsons Project No.
407011-00622

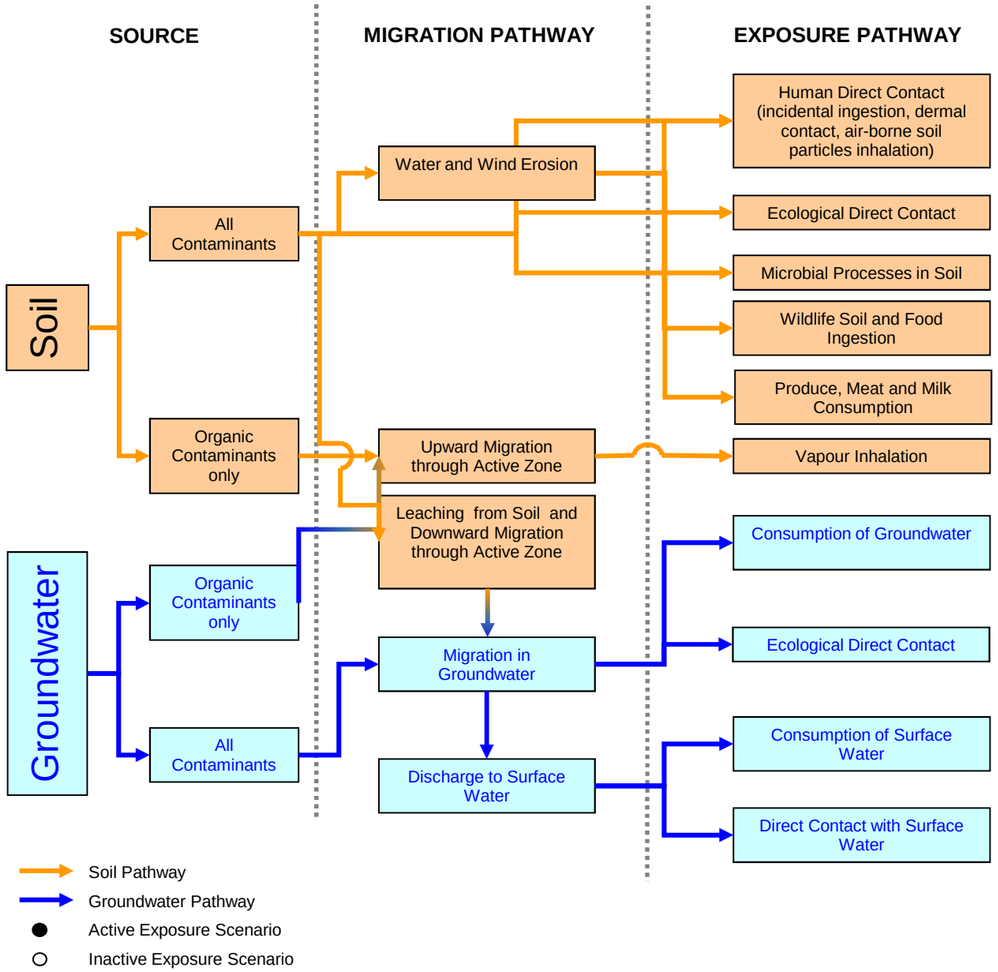
FIG No. 8 REV A

* This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.*

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CALIGBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIFP

Bear Island Flare Pit - Conceptual Exposure Model Flow Chart (Current Land Use and Site Conditions)



RECEPTORS

Humans	Wildlife	Plant and Soil Invertebrates	Freshwater Aquatic Life
●			
		●	
		●	
	●		
●[1]			
○			
		●	
○	●		
			●

Notes: 1) Although the current land use is industrial, it is recognized that due to the size of the site and the geographical features of the area (i.e. river, creek, etc.) animals may move on and off of the site, and hunters are able to hunt in close proximity to the site. As such, meat consumption through hunting should be considered as an active exposure pathway.

IMPERIAL
CONCEPTUAL SITE MODEL
BEAR ISLAND FLARE PIT, NORMAN WELLS, NT

CONCEPTUAL EXPOSURE MODEL
CURRENT LAND USE AND SITE CONDITIONS

OneWay™ to zero harm

Date:	Drawn by:	Edited by:	App'd by:
16-May-18	AH	LG	MB

Advision
WorleyParsons Group

WorleyParsons Project No.: 407011-00622

FIG No.: 9 REV: A

" This drawing is prepared solely for the use of our customer as specified in the accompanying report.
WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: CALGARY

FILE DIRECTORY: U:\CAL\GBS\407011-006220400-CONCEPTUAL SITE MODEL\11.0_FIGURES_&_MAPS\11.5_PDF_FINAL_FIGURES\BIFP

Tables



Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Fine Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIFP-12-1	24-Jul-2012	0.5 - 1.0m	0.68	2.9	6.95	< 1.0	8.1	290	0.43	0.50	14	< 0.15	7.9	17	9.4	< 0.050	1.7	24	0.53	< 1.0	< 0.30	< 1.0	< 1.0	25	85
	24-Jul-2012	2.0 - 2.5m	0.65	0.55	6.68	< 1.0	4.9	200	< 0.40	0.42	11	< 0.15	6.5	12	6.6	< 0.050	1.8	20	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	20	61
	24-Jul-2012	4.0 - 4.5m	0.41	0.23	6.76	< 1.0	7.3	190	< 0.40	0.58	12	< 0.15	7.6	17	8.0	< 0.050	2.1	23	0.59	< 1.0	< 0.30	< 1.0	1.0	21	76
BIFP-12-2	24-Jul-2012	1.0 - 1.5m	0.56	0.67	6.87	< 1.0	8.3	290	0.42	0.59	15	< 0.15	8.3	17	9.7	< 0.050	1.8	25	0.57	< 1.0	< 0.30	1.0	< 1.0	25	90
	24-Jul-2012	2.0 - 2.5m	0.33	0.88	6.81	< 1.0	6.5	160	< 0.40	0.32	9.6	< 0.15	6.0	9.5	6.0	< 0.050	1.6	18	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	18	57
	24-Jul-2012	3.0 - 3.5m	0.44	4.3	6.93	< 1.0	7.0	180	< 0.40	0.37	11	< 0.15	6.8	12	6.6	< 0.050	1.5	20	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	21	67
BIFP-12-3	25-Jul-2012	1.0 - 1.5m	0.32	0.31	6.60	< 1.0	8.1	320	0.47	0.46	15	< 0.15	8.3	19	9.6	< 0.050	1.9	26	0.63	< 1.0	< 0.30	< 1.0	< 1.0	26	81
	25-Jul-2012	2.5 - 3.0m	0.41	0.24	6.91	< 1.0	5.2	130	< 0.40	0.23	9.3	< 0.15	5.2	8.0	5.1	< 0.050	1.4	16	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	16	46
	25-Jul-2012	4.0 - 4.5m	0.23	0.21	7.03	< 1.0	5.1	140	< 0.40	0.35	9.6	< 0.15	6.1	9.3	5.5	< 0.050	1.5	18	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	19	54
(Duplicate)	25-Jul-2012	4.0 - 4.5m	0.44	0.21	6.78	< 1.0	5.3	140	< 0.40	0.39	10	< 0.15	7.3	11	6.4	< 0.050	1.9	20	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	19	61
BIFP-12-4	24-Jul-2012	0.5 - 1.0m	0.57	**5.4** [#1]	6.98	< 1.0	9.4	340	0.49	0.52	15	< 0.15	8.6	19	10	< 0.050	1.9	26	0.62	< 1.0	< 0.30	< 1.0	< 1.0	27	89
	24-Jul-2012	2.0 - 2.5m	0.26	2.4	6.82	< 1.0	6.9	180	< 0.40	0.31	10	< 0.15	6.6	10	6.5	< 0.050	1.7	19	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	19	61
BIFP-12-5	25-Jul-2012	0.5 - 1.0m	0.32	0.37	6.99	< 1.0	10	300	0.45	0.53	15	< 0.15	8.5	18	9.7	< 0.050	1.9	26	0.60	< 1.0	< 0.30	< 1.0	< 1.0	26	85
	25-Jul-2012	1.5 - 2.0m	0.30	0.23	6.80	< 1.0	7.7	270	< 0.40	0.48	13	< 0.15	7.7	17	8.9	< 0.050	1.9	24	0.57	< 1.0	< 0.30	< 1.0	< 1.0	23	79
	25-Jul-2012	3.5 - 4.0m	0.19	0.23	7.24	< 1.0	4.5	92	< 0.40	0.20	7.7	< 0.15	4.9	5.8	4.4	< 0.050	1.1	14	< 0.50	< 1.0	< 0.30	< 1.0	< 1.0	15	40
BIFP-12-6	25-Jul-2012	0.7 - 1.2m	1.0	0.43	7.15	< 1.0	7.2	280	< 0.40	0.42	14	< 0.15	7.3	16	7.9	< 0.050	1.7	23	0.55	< 1.0	< 0.30	< 1.0	< 1.0	24	73
	25-Jul-2012	2.5 - 3.0m	0.47	0.43	6.85	< 1.0	7.7	220	< 0.40	0.77	12	< 0.15	8.5	17	7.7	< 0.050	2.3	24	0.67	< 1.0	< 0.30	< 1.0	1.6	22	74
BIFP-16-1	24-Sep-2016	0.5 - 1.0m	0.26	0.54	6.92	0.61	8.2	340	0.49	0.52	16	< 0.080	9.1	20	10	0.051	2.0	27	0.64	< 0.20	0.15	< 1.0	0.93	24	90
	24-Sep-2016	1.0 - 1.5m	0.25	0.52	6.81	0.57	9.0	320	0.46	0.53	16	< 0.080	9.7	20	10	< 0.050	2.2	28	0.63	< 0.20	0.15	< 1.0	0.93	25	90
	24-Sep-2016	2.5 - 3.0m	0.30	0.48	7.00	0.51	6.3	170	< 0.40	0.46	11	< 0.080	7.0	13	7.0	< 0.050	1.7	20	< 0.50	< 0.20	0.11	< 1.0	0.84	18	65
BIFP-16-1-TP	11-Mar-2016	1.0m	0.60	0.40	7.26	0.69	9.6	370	0.58	0.59	18	< 0.080	9.6	21	11	0.051	2.3	30	0.82	< 0.20	0.19	< 1.0	1.1	30	98
	11-Mar-2016	2.0m	0.43	0.40	7.10	0.58	7.3	240	< 0.40	0.45	13	< 0.080	7.4	14	7.6	< 0.050	1.8	22	0.52	< 0.20	0.11	< 1.0	0.81	22	72
	11-Mar-2016	3.0m	0.45	0.46	7.14	0.71	9.6	280	0.45	0.54	15	< 0.080	9.6	17	10	< 0.050	2.5	28	0.64	< 0.20	0.14	< 1.0	1.0	26	91
BIFP-16-2	24-Sep-2016	0.5 - 1.0m	0.35	0.62	6.82	0.57	**13** [#1]	340	0.49	0.53	16	< 0.080	9.2	19	10	< 0.050	2.1	28	0.63	< 0.20	0.14	< 1.0	0.88	29	93
	24-Sep-2016	1.0 - 1.5m	0.29	0.52	6.78	0.66	9.4	330	0.48	0.59	16	< 0.080	9.8	21	11	< 0.050	2.3	29	0.73	< 0.20	0.16	< 1.0	1.0	26	96
	24-Sep-2016	2.0 - 2.5m	0.53	0.52	6.83	< 0.50	5.4	200	< 0.40	0.36	9.6	< 0.080	6.2	12	6.1	< 0.050	1.3	19	< 0.50	< 0.20	< 0.10	< 1.0	0.85	19	56
BIFP-16-2-TP	12-Mar-2016	1.0m	0.30	0.46	7.34	0.52	6.6	170	< 0.40	0.46	9.2	< 0.080	7.0	12	6.5	< 0.050	1.7	19	< 0.50	< 0.20	0.11	< 1.0	0.80	16	59
	12-Mar-2016	2.0m	0.40	0.49	7.28	< 0.50	5.7	100	< 0.40	0.27	7.8	< 0.080	5.6	7.9	5.1	< 0.050	1.7	17	< 0.50	< 0.20	< 0.10	< 1.0	0.81	15	50
	12-Mar-2016	3.0m	0.60	0.46	7.27	< 0.50	5.6	150	< 0.40	0.35	9.9	< 0.080	6.7	10	6.0	< 0.050	1.5	19	< 0.50	< 0.20	< 0.10	< 1.0	0.81	17	58
BIFP-16-3	24-Sep-2016	0.5 - 1.0m	0.31	3.8	7.12	0.63	9.7	340	0.51	0.56	16	< 0.080	9.5	20	11	< 0.050	2.2	28	0.66	< 0.20	0.14	< 1.0	0.96	26	94
	24-Sep-2016	1.0 - 1.5m	0.49	**6.8** [#1]	6.71	0.57	8.0	330	0.45	0.54	15	< 0.080	8.9	19	9.8	< 0.050	2.1	26	0.63	< 0.20	0.14	< 1.0	0.99	24	87
	24-Sep-2016	2.0 - 2.5m	0.36	1.8	7.20	< 0.50	6.0	170	< 0.40	0.26	9.3	< 0.080	6.0	7.9	5.8	< 0.050	1.5	16	< 0.50	< 0.20	< 0.10	< 1.0	0.68	18	55
BIFP-16-3-TP	12-Mar-2016	1.0m	1.1	0.33	7.46	0.58	7.7	280	0.42	0.49	13	< 0.080	7.4	16	8.2	< 0.050	2.0	23	0.60	< 0.20	0.13	< 1.0	0.89	24	76
	12-Mar-2016	2.0m	1.1	0.32	7.39	0.55	7.7	210	< 0.40	0.47	12	< 0.080	7.5	15	7.8	< 0.050	1.9	23	0.54	< 0.20	0.12	< 1.0	0.81	20	73
	12-Mar-2016	2.5m	1.1	0.31	7.25	0.77	10	260	0.47	0.65	14	< 0.080	9.9	18	10	< 0.050	2.7	29	0.69	< 0.20	0.17	< 1.0	1.3	26	100

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity			Total Metals																			
			Electrical Conductivity (dS/m)	Sodium Adsorption Ratio (none)	pH (pH units)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Fine Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIFP-16-4	24-Sep-2016	1.0 - 1.5m	0.35	0.38	7.51	0.53	7.1	200	< 0.40	0.48	11	< 0.080	6.9	13	7.4	< 0.050	1.8	21	0.53	< 0.20	0.11	< 1.0	0.88	19	69
	24-Sep-2016	2.5 - 3.0m	0.31	0.44	7.55	< 0.50	5.6	160	< 0.40	0.41	8.8	< 0.080	5.3	10	6.1	< 0.050	1.5	16	< 0.50	< 0.20	< 0.10	< 1.0	0.79	16	56
	24-Sep-2016	3.5 - 4.0m	0.45	0.62	7.37	< 0.50	4.6	110	< 0.40	0.23	7.9	< 0.080	4.8	6.2	4.9	< 0.050	1.3	14	< 0.50	< 0.20	< 0.10	< 1.0	0.57	14	43
BIFP-16-4-TP	13-Mar-2016	1.0m	0.47	0.36	7.42	0.57	7.3	240	< 0.40	0.51	13	< 0.080	7.5	15	8.2	< 0.050	1.8	22	0.53	< 0.20	0.13	< 1.0	0.81	22	77
	13-Mar-2016	2.0m	1.0	0.32	7.47	0.72	8.6	250	0.41	0.56	14	< 0.080	8.5	16	9.1	< 0.050	2.2	26	0.64	< 0.20	0.13	< 1.0	1.0	26	84
	13-Mar-2016	3.7m	0.88	0.62	7.33	0.66	8.8	220	< 0.40	0.54	13	< 0.080	8.4	15	8.3	< 0.050	2.2	26	0.58	< 0.20	0.12	< 1.0	1.1	25	85
BIFP-16-5	24-Sep-2016	1.0 - 1.5m	0.49	0.53	7.26	0.59	8.4	310	0.42	0.52	15	< 0.080	7.9	18	9.6	< 0.050	2.1	25	0.67	< 0.20	0.13	< 1.0	0.92	22	82
	24-Sep-2016	2.5 - 3.0m	0.34	0.47	6.83	< 0.50	7.2	200	< 0.40	0.48	8.8	< 0.080	5.7	11	6.3	< 0.050	1.8	17	< 0.50	< 0.20	< 0.10	< 1.0	0.97	16	58
	24-Sep-2016	3.0 - 3.5m	0.22	0.49	7.27	< 0.50	5.0	110	< 0.40	0.25	7.3	< 0.080	4.7	6.5	4.7	< 0.050	1.4	14	< 0.50	< 0.20	< 0.10	< 1.0	0.58	14	44
	24-Sep-2016	4.0 - 4.5m	0.41	0.52	7.28	< 0.50	5.3	140	< 0.40	0.33	8.6	< 0.080	6.6	8.6	5.7	< 0.050	1.6	17	< 0.50	< 0.20	< 0.10	< 1.0	0.80	16	58
BIFP-16-6	25-Sep-2016	1.7 - 2.5m	0.37	0.46	7.07	0.53	5.2	270	< 0.40	0.50	12	< 0.080	6.5	13	6.7	< 0.050	1.8	20	< 0.50	< 0.20	0.11	< 1.0	0.84	26	65
	25-Sep-2016	5.5 - 6.0m	0.49	0.59	7.14	< 0.50	5.8	170	< 0.40	0.33	10	< 0.080	6.1	9.0	6.0	< 0.050	1.4	18	< 0.50	< 0.20	< 0.10	< 1.0	0.69	19	58
	25-Sep-2016	7.0 - 7.5m	0.43	0.50	7.03	< 0.50	5.7	160	< 0.40	0.32	9.7	< 0.080	6.5	9.0	5.8	< 0.050	1.5	18	< 0.50	< 0.20	< 0.10	< 1.0	0.70	20	57
BIFP-16-7	25-Sep-2016	1.0 - 1.5m	0.96	0.48	7.24	0.59	7.8	340	0.45	0.51	15	< 0.080	8.1	24	8.9	< 0.050	1.9	24	0.60	< 0.20	0.14	< 1.0	0.93	26	83
	25-Sep-2016	2.5 - 3.0m	0.81	0.87	7.41	< 0.50	4.4	110	< 0.40	0.23	8.7	< 0.080	5.6	9.5	4.7	< 0.050	1.2	15	< 0.50	< 0.20	< 0.10	< 1.0	0.62	16	44
	25-Sep-2016	5.5 - 6.0m	0.95	0.57	7.07	< 0.50	6.2	180	< 0.40	0.39	10	< 0.080	6.5	11	6.3	< 0.050	1.5	18	< 0.50	< 0.20	< 0.10	< 1.0	0.77	20	62
BIFP-16-8	25-Sep-2016	1.0 - 1.5m	0.42	0.37	7.02	0.68	9.3	370	0.61	0.57	18	< 0.080	9.6	23	11	< 0.050	2.2	29	0.72	< 0.20	0.16	< 1.0	1.0	33	94
	25-Sep-2016	2.0 - 2.5m	0.29	0.56	7.07	< 0.50	6.0	260	< 0.40	0.40	12	< 0.080	6.6	14	6.8	< 0.050	1.7	19	< 0.50	< 0.20	0.10	< 1.0	0.86	23	66
	25-Sep-2016	4.0 - 4.5m	0.79	0.51	6.87	< 0.50	5.7	160	< 0.40	0.34	9.1	< 0.080	5.9	10	5.7	< 0.050	1.4	17	< 0.50	< 0.20	< 0.10	< 1.0	0.70	18	55
BIFP-16-9	25-Sep-2016	1.0 - 1.5m	0.27	0.42	7.08	0.68	9.3	360	0.55	0.53	17	< 0.080	9.2	20	10	< 0.050	2.2	28	0.73	< 0.20	0.17	< 1.0	0.99	31	93
	26-Sep-2016	2.0 - 2.5m	0.28	0.44	6.94	0.53	6.3	220	< 0.40	0.51	12	< 0.080	7.8	15	7.5	0.055	1.7	23	< 0.50	< 0.20	0.11	< 1.0	0.94	21	70
	26-Sep-2016	4.0 - 4.5m	0.43	0.31	6.74	0.65	7.8	250	0.41	0.63	14	< 0.080	8.4	20	9.3	0.062	2.5	25	0.69	< 0.20	0.14	< 1.0	1.1	24	86
BIFP-16-10	26-Sep-2016	1.0 - 1.5m	0.34	0.42	7.07	0.61	8.4	300	0.46	0.74	14	< 0.080	8.8	21	10	0.067	1.9	27	0.66	< 0.20	0.14	< 1.0	1.0	25	85
	26-Sep-2016	2.0 - 2.5m	0.25	0.47	7.00	< 0.50	6.1	180	< 0.40	0.38	11	< 0.080	6.6	12	6.4	< 0.050	1.8	19	< 0.50	< 0.20	< 0.10	< 1.0	0.91	19	64
	26-Sep-2016	3.0 - 3.5m	0.28	0.55	6.83	< 0.50	5.2	150	< 0.40	0.26	11	< 0.080	5.4	8.1	5.2	< 0.050	1.5	15	< 0.50	< 0.20	< 0.10	< 1.0	0.68	16	50
BIFP-16-11	26-Sep-2016	0.2 - 0.7m	0.70	0.33	7.17	0.59	8.4	330	0.50	0.47	15	< 0.080	8.2	20	9.0	< 0.050	1.9	25	0.57	< 0.20	0.14	< 1.0	0.85	29	82
	26-Sep-2016	1.0 - 1.5m	0.70	0.37	6.79	0.55	7.1	220	0.51	0.46	12	< 0.080	7.9	18	8.1	0.052	1.9	23	0.55	< 0.20	0.12	< 1.0	0.90	21	76
	26-Sep-2016	2.0 - 2.5m	0.87	0.59	6.96	< 0.50	6.1	120	< 0.40	0.37	9.5	< 0.080	7.4	11	6.4	< 0.050	2.2	20	< 0.50	< 0.20	< 0.10	< 1.0	0.80	18	61
BIFP-16-12	26-Sep-2016	0.5 - 1.0m	0.32	0.61	7.34	0.64	9.7	330	0.46	0.54	14	< 0.080	8.4	19	9.3	< 0.050	2.8	26	0.61	< 0.20	0.12	< 1.0	0.92	24	83
	26-Sep-2016	1.0 - 1.5m	0.35	0.36	6.78	0.60	8.1	370	0.46	0.55	15	< 0.080	8.4	22	9.4	< 0.050	2.0	25	0.63	< 0.20	0.15	< 1.0	1.0	28	86
	26-Sep-2016	2.2 - 2.7m	0.37	0.39	6.83	< 0.50	5.9	180	< 0.40	0.39	9.6	< 0.080	6.8	11	5.9	< 0.050	1.6	18	< 0.50	< 0.20	< 0.10	< 1.0	0.84	19	55
	26-Sep-2016	3.0 - 3.5m	0.20	0.42	7.02	< 0.50	5.0	120	< 0.40	0.24	8.8	< 0.080	6.0	7.0	4.7	< 0.050	1.3	16	< 0.50	< 0.20	< 0.10	< 1.0	0.61	18	51
BIFP-16-13	01-Oct-2016	1.0 - 1.5m	0.54	0.45	7.18	0.55	8.2	300	0.44	0.47	15	< 0.080	8.8	18	9.2	0.059	1.9	26	0.63	< 0.20	0.13	< 1.0	0.94	24	82
	01-Oct-2016	2.5 - 3.0m	0.31	0.46	7.42	< 0.50	5.0	100	< 0.40	0.22	8.1	< 0.080	6.3	7.4	4.8	< 0.050	1.4	16	< 0.50	< 0.20	< 0.10	< 1.0	0.62	15	48
	01-Oct-2016	3.0 - 3.5m	0.33	0.39	6.77	< 0.50	5.6	120	< 0.40	0.36	9.9	< 0.080	8.4	8.6	5.6	< 0.050	1.6	19	< 0.50	< 0.20	< 0.10	< 1.0	1.0	18	58
BIFP-16-14	01-Oct-2016	1.0 - 1.5m	1.4	0.34	7.58	0.60	8.1	230	0.41	0.57	13	< 0.080	8.1	17	8.5	0.059	2.1	25	0.64	< 0.20	0.12	< 1.0	1.1	24	79
	01-Oct-2016	2.5 - 3.0m	1.4	0.36	7.64	0.51	6.9	180	< 0.40	0.40	12	< 0.080	7.6	13	7.3	0.051	1.7	22	< 0.50	< 0.20	< 0.10	< 1.0	0.84	22	70
	01-Oct-2016	3.0 - 4.0m	1.3	0.39	7.44	< 0.50	4.8	84	< 0.40	0.18	8.3	< 0.080	4.6	6.1	4.5	< 0.050	1.1	14	< 0.50	< 0.20	< 0.10	< 1.0	0.51	15	45

Advisian
WorleyParsons Group

Table 1

Soil Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Salinity: Electrical Conductivity (dS/m)	Salinity: Sodium Adsorption Ratio (none)	Salinity: pH (pH units)	Total Metals: Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (Total) (mg/kg)	Chromium (hexavalent) (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Tin (mg/kg)	Uranium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
CCME Residential/Parkland Fine Sub-Surface [#2]			**2**	**5**	**(6 - 8)**	**20**	**12**	**500**	**4**	**10**	**52**	**0.4**	**50**	**63**	**140**	**6.6**	**10**	**45**	**1**	**20**	**1**	**50**	**23**	**130**	**200**
BIFP-16-15	01-Oct-2016	1.0 - 1.5m	0.35	0.44	7.15	0.56	8.6	310	0.48	0.53	16	< 0.080	9.1	19	9.6	0.069	2.0	26	0.63	< 0.20	0.14	< 1.0	0.93	26	88
	01-Oct-2016	2.0 - 2.5m	0.25	0.51	7.24	< 0.50	6.0	180	< 0.40	0.32	11	< 0.080	6.5	9.8	6.0	< 0.050	1.7	18	< 0.50	< 0.20	< 0.10	< 1.0	0.72	18	59
BIFP-16-16	01-Oct-2016	0.0 - 0.5m	0.55	0.44	6.77	0.58	9.0	340	0.52	0.63	17	< 0.080	9.4	21	10	0.061	2.2	29	0.67	< 0.20	0.16	< 1.0	1.0	28	95
	01-Oct-2016	1.0 - 1.5m	0.37	0.52	6.78	0.53	8.2	310	0.43	0.52	15	< 0.080	8.3	18	9.0	0.060	1.9	25	0.61	< 0.20	0.14	< 1.0	0.98	24	84
	01-Oct-2016	8.5 - 9.0m	0.42	0.78	7.62	0.65	11	290	0.71	0.46	22	< 0.080	12	30	12	0.060	2.1	35	0.79	< 0.20	0.14	< 1.0	1.3	32	100
BIFP-17-1	25-Sep-2017	1.0 - 1.5m	0.90	0.38	7.37	0.58	7.6	300	0.44	0.59	14	< 0.080	8.1	17	8.6	---	1.9	24	0.59	< 0.20	0.15	< 1.0	0.90	23	90
	25-Sep-2017	4.5 - 5.0m	1.7	0.34	7.56	0.52	7.3	220	< 0.40	0.43	12	< 0.080	7.5	15	8.5	---	1.8	22	< 0.50	< 0.20	0.11	< 1.0	0.80	21	73
	25-Sep-2017	5.5 - 6.0m	0.77	0.42	7.62	< 0.50	6.2	180	< 0.40	0.44	9.9	< 0.080	6.0	11	6.5	---	1.6	18	< 0.50	< 0.20	< 0.10	< 1.0	0.78	17	61
BIFP-17-2	25-Sep-2017	0.5 - 1.0m	0.38	0.51	7.47	0.62	7.4	290	< 0.40	0.50	13	< 0.080	7.5	16	8.3	---	1.9	23	0.56	< 0.20	0.13	< 1.0	0.92	22	75
BIFP-17-3	25-Sep-2017	1.0 - 1.5m	**2.9** [#1]	0.38	7.49	0.59	7.4	270	0.42	0.52	13	< 0.080	7.4	16	8.2	---	1.9	23	0.61	< 0.20	0.13	< 1.0	0.97	22	77
	25-Sep-2017	4.0 - 4.5m	1.6	0.31	7.58	0.54	6.9	210	< 0.40	0.50	11	< 0.080	7.1	14	7.5	---	1.9	21	0.53	< 0.20	0.12	< 1.0	0.94	21	71
	25-Sep-2017	5.0 - 5.5m	0.54	0.85	7.70	< 0.50	6.2	170	< 0.40	0.39	11	< 0.080	6.4	9.9	6.1	---	1.7	18	< 0.50	< 0.20	< 0.10	< 1.0	0.82	18	61
BIFP-17-4	25-Sep-2017	1.0 - 1.5m	0.35	0.49	7.47	0.54	7.6	240	< 0.40	0.48	13	< 0.080	7.9	16	8.4	---	1.8	23	0.56	< 0.20	0.12	< 1.0	0.81	21	74
	25-Sep-2017	2.0 - 2.5m	0.38	0.62	7.55	< 0.50	5.3	140	< 0.40	0.36	8.9	< 0.080	5.8	10	5.7	---	1.4	17	< 0.50	< 0.20	< 0.10	< 1.0	0.66	16	58
BIFP-17-5	25-Sep-2017	0.5 - 1.0m	0.37	0.53	7.64	0.54	7.4	300	0.43	0.48	14	< 0.080	7.9	17	8.5	---	1.8	24	0.54	< 0.20	0.13	< 1.0	0.83	23	76
	25-Sep-2017	1.5 - 2.0m	0.39	0.45	7.45	0.62	8.3	300	0.44	0.56	14	< 0.080	8.5	18	9.3	---	2.0	25	0.58	< 0.20	0.13	< 1.0	0.89	23	83
BIFP-17-6	25-Sep-2017	0.5 - 1.0m	0.42	0.44	7.61	0.54	7.4	280	0.40	0.54	13	< 0.080	7.8	17	8.6	---	1.8	23	0.54	< 0.20	0.13	< 1.0	0.83	21	80
	25-Sep-2017	2.5 - 3.0m	0.27	0.47	7.61	< 0.50	6.0	160	< 0.40	0.33	9.0	< 0.080	6.1	9.4	5.9	---	1.5	17	< 0.50	< 0.20	< 0.10	< 1.0	0.75	16	56
BIFP-17-7	26-Sep-2017	0.5 - 1.0m	0.39	0.45	7.52	0.56	8.1	300	0.43	0.46	13	< 0.080	8.2	18	9.0	---	1.9	24	0.59	< 0.20	0.13	< 1.0	0.85	22	80
	26-Sep-2017	1.5 - 2.0m	0.33	0.51	7.48	< 0.50	5.8	170	< 0.40	0.37	9.7	< 0.080	6.2	11	6.3	---	1.5	18	< 0.50	< 0.20	< 0.10	< 1.0	0.68	17	56
BIFP-17-8	26-Sep-2017	0.5 - 1.0m	0.49	0.40	7.46	0.63	7.9	290	0.44	0.51	14	< 0.080	8.3	18	9.6	---	1.9	25	0.62	< 0.20	0.14	< 1.0	0.90	23	82
	26-Sep-2017	1.0 - 1.5m	0.46	0.47	7.50	< 0.50	7.1	230	0.40	0.43	13	< 0.080	7.7	15	8.2	---	1.7	23	0.53	< 0.20	0.13	< 1.0	0.80	21	73
BIFP-17-9	26-Sep-2017	0.5 - 1.0m	0.80	0.36	7.39	0.67	8.5	350	0.51	0.66	15	< 0.080	9.3	20	10	---	1.5	28	0.75	< 0.20	0.15	< 1.0	0.99	25	91
	26-Sep-2017	1.5 - 2.0m	0.47	0.50	7.49	0.63	7.8	320	0.44	0.61	14	< 0.080	8.3	18	9.0	---	2.1	25	0.62	< 0.20	0.14	< 1.0	0.95	23	85
(Duplicate)	26-Sep-2017	1.5 - 2.0m	0.47	0.41	7.47	0.64	8.3	300	0.44	0.56	14	< 0.080	8.2	18	9.1	---	2.1	25	0.60	< 0.20	0.14	< 1.0	0.90	23	83
TP11-6	10-Aug-2011	2.0 - 2.5m	0.53	0.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline/criteria.
4. Highlighting indicates non-detect parameters above applied guideline/criteria.
5. Highlighting indicates parameters at applied guideline/criteria.
6. Chloride (Calculated)
7. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Surface soils, 1999 and updates)
8. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, 1999 and updates)

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																	
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			60	110	120	65	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Residential/Parkland Fine Sub-Surface [#2]			120	220	240	130	---	---	---	---	---	0.28	320	2.5	1	0.6	5.3	5.3	1	6.2	1	15.4	0.25	1	1	0.013	0.046	7.7
CCME Canada Wide Standards Surface [#3]			---	---	---	---	210	150	1300	5600	5600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	800	1000	3500	10000	10000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-12-1	24-Jul-2012	0.5 - 1.0m	< 0.0050	< 0.020	0.019	< 0.040	< 12	**1100** [#3]	**21000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	2.0 - 2.5m	1.0	< 0.030	5.4	9.3	**710** [#3]	**4000** [#3]	**8600** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	4.0 - 4.5m	0.059	< 0.020	0.020	< 0.040	< 12	< 10	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-12-2	24-Jul-2012	1.0 - 1.5m	0.034	< 0.020	0.029	0.077	< 12	68	660	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	2.0 - 2.5m	3.5	< 0.020	< 0.010	< 0.040	< 12	< 10	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	3.0 - 3.5m	2.4	< 0.020	0.017	< 0.040	< 12	< 10	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-12-3	25-Jul-2012	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	19	65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Jul-2012	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-12-4	24-Jul-2012	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	18	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Jul-2012	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-12-5	25-Jul-2012	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Jul-2012	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Jul-2012	3.5 - 4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-12-6	25-Jul-2012	0.7 - 1.2m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	32	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Jul-2012	2.5 - 3.0m	0.075	< 0.020	< 0.010	< 0.040	< 12	20	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-1	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0072	< 0.0050	0.0077	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.12	0.0084	0.016	0.0076
BIFP-14-2	02-Mar-2014	2.0m	0.012	< 0.020	< 0.010	< 0.040	< 12	60	260	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0075	< 0.0050	0.0092	< 0.0050	< 0.0050	< 0.0050	0.0057	0.12	0.018	0.022	0.0092
BIFP-14-3	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	15	97	< 50	---	< 0.0050	< 0.0050	< 0.0040	0.0058	0.0058	< 0.10	0.015	< 0.0050	0.016	0.0052	0.0095	< 0.0050	0.0063	0.24	**0.015** [#1]	0.034	0.019
BIFP-14-4	02-Mar-2014	2.5m	0.59	< 0.020	< 0.010	0.21	< 12	120	410	190	---	0.0053	0.010	< 0.0040	< 0.0060	< 0.0050	< 0.10	0.0076	< 0.0050	0.020	< 0.0050	0.0076	0.042	< 0.0050	0.14	**0.14** [#1]	**0.11** [#1]	0.024
BIFP-14-5	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0072	< 0.0050	0.0085	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.12	0.0079	0.017	0.0081
BIFP-14-6	02-Mar-2014	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	38	460	210	---	< 0.0050	< 0.0050	< 0.0040	0.0052	0.0069	< 0.10	0.017	< 0.0050	0.015	0.0052	0.011	0.0054	0.0072	0.24	**0.014** [#1]	0.033	0.025
(Duplicate)	02-Mar-2014	2.0m	0.017	< 0.020	< 0.010	< 0.040	< 12	76	570	290	---	0.0068	0.0060	< 0.0040	0.010	0.011	< 0.10	0.026	< 0.0050	0.024	0.0089	0.016	0.0098	0.012	0.32	**0.021** [#1]	0.042	0.047
BIFP-14-7	02-Mar-2014	2.0m	0.057	< 0.020	< 0.010	< 0.040	< 12	30	280	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	0.0054	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.082	< 0.0050	0.0088	< 0.0050
BIFP-14-15	07-Mar-2014	2.0m	0.41	< 0.020	< 0.010	< 0.040	15	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0058	< 0.0050
BIFP-14-16	07-Mar-2014	2.5m	1.0	< 0.020	0.74	0.56	20	30	56	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	**0.11** [#1]	0.011	< 0.0050
BIFP-14-17	09-Mar-2014	2.5m	0.76	< 0.020	< 0.010	0.38	< 12	29	110	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	0.011	0.010	< 0.0050
BIFP-14-18	09-Mar-2014	2.0m	1.3	< 0.020	0.028	0.098	< 12	37	450	280	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0076	< 0.0050	0.0094	< 0.0050	0.0065	0.0094	0.0063	0.12	**0.030** [#1]	0.036	0.015
BIFP-14-19	09-Mar-2014	2.0m	0.61	< 0.020	< 0.010	< 0.040	< 12	47	640	300	---	< 0.0050	0.0074	< 0.0040	0.0050	0.0050	< 0.10	0.010	< 0.0050	0.018	< 0.0050	0.0085	0.019	0.0057	0.13	**0.045** [#1]	**0.083** [#1]	0.019
(Duplicate)	09-Mar-2014	2.0m	0.60	< 0.020	< 0.010	0.35	< 12	12	120	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-25	15-Mar-2014	4.0m	0.15	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	0.0055	< 0.0050	< 0.0050	0.0051	< 0.0050	0.097	0.016	0.018	0.0069

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**60**	**110**	**120**	**65**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Residential/Parkland Fine Sub-Surface [#2]			**120**	**220**	**240**	**130**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Canada Wide Standards Surface [#3]			---	---	---	---	**210**	**150**	**1300**	**5600**	**5600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-26	18-Mar-2014	4.0m	0.88	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.078	0.0050	0.0087	< 0.0050
(Duplicate)	18-Mar-2014	4.0m	0.93	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-29	18-Mar-2014	2.0m	0.57	< 0.020	< 0.010	< 0.040	< 12	39	470	270	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0055	< 0.10	0.011	< 0.0050	0.012	< 0.0050	0.0071	0.0056	0.0076	0.15	**0.016** [#1]	0.028	0.023
BIFP-14-33	19-Mar-2014	2.0m	1.7	< 0.020	< 0.010	< 0.040	< 12	20	140	69	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	< 0.0050	0.0073	< 0.0050	0.0052	< 0.0050	< 0.0050	0.12	0.0054	0.015	0.011
BIFP-14-38	29-Mar-2014	2.0m	0.14	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0075	< 0.0050
BIFP-14-39	29-Mar-2014	3.0m	2.8	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0075	< 0.0050
BIFP-14-40	29-Mar-2014	2.0m	1.2	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0070	< 0.0050	0.0057	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.11	0.0053	0.013	0.0083
BIFP-14-41	02-Apr-2014	2.0m	4.4	< 0.030	16	29	**920** [#3]	**9400** [#3]	**29000** [#3]	**14000** [#3]	---	**0.69** [#1]	< 0.53	< 0.32	< 0.24	0.15	0.25	0.25	< 0.0050	0.91	< 0.11	0.23	**2.5** [#1]	0.050	**2.8** [#1]	**12** [#1]	**6.5** [#1]	1.0
BIFP-14-42	02-Apr-2014	2.0m	2.6	< 0.020	16	22	**1100** [#3]	**9100** [#3]	**17000** [#3]	**6000** [#3]	---	0.16	< 0.18	< 0.10	< 0.066	0.021	< 0.10	0.034	< 0.0050	0.14	< 0.0050	0.079	**0.74** [#1]	< 0.0050	0.55	**1.4** [#1]	**1.5** [#1]	0.27
(Duplicate)	02-Apr-2014	2.0m	4.4	< 0.050	26	42	**830** [#3]	**12000** [#3]	**26000** [#3]	**9300** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-43	02-Apr-2014	2.0m	0.52	< 0.020	2.1	2.2	140	**950** [#3]	**1900** [#3]	650	2200	0.083	< 0.057	< 0.021	< 0.017	0.0083	< 0.10	0.015	< 0.0050	0.060	< 0.0050	0.020	0.24	< 0.0050	0.22	**1.2** [#1]	**0.52** [#1]	0.072
BIFP-14-44	02-Apr-2014	2.0m	3.0	< 0.020	0.022	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	< 0.0050	0.0070	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.12	0.0084	0.020	0.0080
BIFP-14-45	02-Apr-2014	2.0m	2.8	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	< 0.0050	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.12	0.0057	0.017	0.0079
BIFP-14-46	02-Apr-2014	2.0m	4.0	< 0.020	< 0.010	< 0.040	< 12	26	210	110	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	< 0.0050	0.0064	< 0.0050	< 0.0050	0.0065	< 0.0050	0.12	0.0077	0.020	0.0094
BIFP-14-47	02-Apr-2014	2.0m	0.50	< 0.020	0.10	0.22	< 12	15	270	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0070	< 0.0050	0.0059	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.11	0.015	0.016	0.0085
BIFP-14-48	02-Apr-2014	2.0m	4.9	< 0.020	7.6	8.8	**290** [#3]	**4500** [#3]	**14000** [#3]	**6000** [#3]	---	**0.48** [#1]	< 0.43	0.30	< 0.30	0.13	0.23	0.24	< 0.0050	0.81	< 0.12	0.17	**2.0** [#1]	0.042	**2.6** [#1]	**8.1** [#1]	**5.2** [#1]	0.80
BIFP-14-49	02-Apr-2014	2.5m	0.29	< 0.020	< 0.010	0.84	< 12	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.010	< 0.0050
BIFP-14-50	02-Apr-2014	2.5m	2.2	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	---	YES	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.013	< 0.0050
BIFP-14-TP1	05-Apr-2014	0.0 - 1.0m	0.017	< 0.020	< 0.010	< 0.040	< 12	**6700** [#3]	**19000** [#3]	**7900** [#3]	---	< 0.050	< 0.060	< 0.040	0.071	0.11	0.19	0.19	< 0.050	0.34	0.050	0.13	< 0.050	< 0.050	**2.1** [#1]	< 0.050 [#1]	< 0.19 [#1]	0.73
	05-Apr-2014	1.0 - 2.0m	18	< 0.020	< 0.010	26	**1200** [#3]	**4800** [#3]	**11000** [#3]	**3600** [#3]	---	< 0.37 [#1]	< 0.35	< 0.040	< 0.17	< 0.050	< 0.10	0.078	< 0.050	0.31	< 0.050	0.14	**1.7** [#1]	< 0.050	**1.4** [#1]	**8.0** [#1]	**4.1** [#1]	0.44
	05-Apr-2014	2.0 - 2.5m	33	< 0.020	6.0	62	**1300** [#3]	**5800** [#3]	**11000** [#3]	**3600** [#3]	---	0.16	< 0.24	< 0.16	< 0.069	0.014	< 0.10	0.039	< 0.0050	0.33	< 0.022	0.11	**1.1** [#1]	< 0.022	0.71	**5.0** [#1]	**2.8** [#1]	< 0.36
BIFP-14-TP2	05-Apr-2014	0.0 - 1.0m	2.1	< 0.020	0.035	0.15	< 12	32	**1100** [#3]	880	3300	< 0.0050	< 0.0050	< 0.0040	0.0053	0.0063	< 0.10	0.014	< 0.0050	0.017	< 0.0050	0.0090	0.0064	0.012	0.21	**0.037** [#1]	0.043	0.025
	05-Apr-2014	1.0 - 2.0m	2.6	0.050	4.4	21	**370** [#3]	**910** [#3]	**1300** [#3]	370	---	< 0.042	< 0.045	< 0.0040	0.012	< 0.0050	< 0.10	0.0082	< 0.0050	0.041	< 0.0050	0.012	0.25 [#1]	< 0.0050	0.15	**1.6** [#1]	**0.55** [#1]	0.028
	05-Apr-2014	2.0 - 3.0m	9.5	0.67	9.9	54	**1200** [#3]	**2200** [#3]	**3100** [#3]	900	---	0.042	< 0.070	< 0.0042	0.018	< 0.0050	< 0.10	0.0098	< 0.0050	0.058	< 0.0050	0.017	**0.31** [#1]	0.0069	0.21	**2.1** [#1]	**0.69** [#1]	0.049
(Duplicate)	05-Apr-2014	2.0 - 3.0m	4.9	0.11	2.1	16	**360** [#3]	**840** [#3]	**1200** [#3]	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-TP3	05-Apr-2014	0.0 - 1.0m	0.050	< 0.020	< 0.010	< 0.040	< 12	48	610	300	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0085	< 0.0050	0.0092	< 0.0050	0.0065	< 0.0050	0.0093	0.16	**0.021** [#1]	0.030	0.015
	05-Apr-2014	1.0 - 2.0m	17	39	18	**74** [#1]	**1900** [#3]	**2600** [#3]	**3600** [#3]	950	---	0.077	< 0.18	< 0.0040	< 0.026	< 0.0050	< 0.10	0.012	< 0.0050	0.14	< 0.0050	0.018	**0.73** [#1]	0.015	0.32	**5.0** [#1]	**1.7** [#1]	0.18
	05-Apr-2014	2.0 - 3.0m	25	52	23	**96** [#1]	**1700** [#3]	**3900** [#3]	**5400** [#3]	1500	---	0.070	< 0.13	< 0.024	< 0.017	< 0.0050	< 0.10	0.0082	< 0.0050	0.074	< 0.0050	0.027	**0.60** [#1]	< 0.0050	0.15	**4.2** [#1]	**1.2** [#1]	0.086

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH															
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50}+)-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**60**	**110**	**120**	**65**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Residential/Parkland Fine Sub-Surface [#2]			**120**	**220**	**240**	**130**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Canada Wide Standards Surface [#3]			---	---	---	---	**210**	**150**	**1300**	**5600**	**5600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-TP4	05-Apr-2014	0.0 - 1.0m	0.054	0.031	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0068	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.10	0.0056	0.012	0.0065
	05-Apr-2014	1.0 - 2.0m	0.050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0063	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.075	< 0.0050	0.016	0.0060
	05-Apr-2014	2.0 - 3.0m	0.55	< 0.020	< 0.010	< 0.040	< 12	< 10	50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0053	< 0.10	0.0094	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.098	0.0055	0.013	0.0068
(Duplicate)	05-Apr-2014	2.0 - 3.0m	0.57	< 0.020	0.020	< 0.040	< 12	< 10	57	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-14-TP5	10-Apr-2014	0.0 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0081	< 0.0050	0.010	< 0.0050	0.0060	< 0.0050	0.0060	0.15	0.010	0.024	0.011
	10-Apr-2014	1.0 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.080	< 0.0050	0.0097	< 0.0050
	10-Apr-2014	2.0 - 2.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0076	< 0.0050
BIFP-14-TP6	11-Apr-2014	0.0 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0072	< 0.0050	0.0082	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.12	0.0092	0.019	0.0091
	11-Apr-2014	1.0 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0072	< 0.0050
	11-Apr-2014	2.0 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0084	< 0.0050
(Duplicate)	11-Apr-2014	2.0 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-16-1	24-Sep-2016	0.5 - 1.0m	0.15	< 0.020	0.019	< 0.040	20	< 10	71	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0063	< 0.10	0.012	< 0.0050	0.0080	< 0.0050	0.0081	< 0.0050	0.0076	0.17	0.011	0.025	0.015
	24-Sep-2016	1.0 - 1.5m	0.22	< 0.020	0.13	2.1	110	**170** [#3]	290	75	---	0.0089	0.0095	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0079	< 0.0050	0.0093	< 0.0050	0.0085	0.044	0.0058	0.14	**0.52** [#1]	**0.093** [#1]	0.020
	24-Sep-2016	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0068	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.10	0.0077	0.015	0.0088
BIFP-16-1-TP	11-Mar-2016	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	480	350	---	< 0.0050	0.0059	< 0.0040	< 0.0050	0.0074	< 0.10	0.017	< 0.0050	0.012	0.0051	0.0071	0.0053	0.014	0.20	0.0068	0.024	0.015
	11-Mar-2016	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	0.0055	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.096	< 0.0050	0.010	0.0061
	11-Mar-2016	3.0m	0.0085	< 0.020	0.025	< 0.040	< 12	< 10	140	93	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.083	0.0063	0.0076	0.0051
BIFP-16-2	24-Sep-2016	0.5 - 1.0m	< 0.0050	0.056	0.028	0.098	< 12	86	**1500** [#3]	970	4800	< 0.0050	0.021	0.0058	0.011	0.018	< 0.10	0.040	< 0.0050	0.016	0.012	0.023	0.0085	0.035	0.43	**0.051** [#1]	**0.063** [#1]	0.089
	24-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	52	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0062	< 0.10	0.012	< 0.0050	0.0084	< 0.0050	0.0086	< 0.0050	0.0072	0.17	0.013 [#1]	0.027	0.016
	24-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.093	< 0.0050	0.013	0.0076
BIFP-16-2-TP	12-Mar-2016	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.060	< 0.0050	0.0060	< 0.0050
	12-Mar-2016	2.0m	0.0095	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.078	< 0.0050	0.0076	< 0.0050
	12-Mar-2016	3.0m	0.032	< 0.020	0.057	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.076	< 0.0050	0.0065	< 0.0050
(Duplicate)	12-Mar-2016	3.0m	0.041	< 0.020	0.072	< 0.040	< 12	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-16-3	24-Sep-2016	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	96	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0068	< 0.10	0.013	< 0.0050	0.0094	< 0.0050	0.0093	0.0058	0.010	0.19	0.011	0.027	0.019
	24-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	110	55	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0058	< 0.10	0.012	< 0.0050	0.0083	< 0.0050	0.0084	< 0.0050	0.0093	0.17	0.011	0.027	0.017
(Duplicate)	24-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	24-Sep-2016	2.0 - 2.5m	0.010	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.012	< 0.0050	0.076	< 0.0050	0.011	< 0.0050
BIFP-16-3-TP	12-Mar-2016	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	< 0.0050	< 0.0050	< 0.0050	0.0073	< 0.0050	< 0.0050	0.090	< 0.0050	0.0088	0.0085
	12-Mar-2016	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0068	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.098	< 0.0050	0.010	0.0066
	12-Mar-2016	2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.093	< 0.0050	0.0098	0.0062

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50}+)-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**60**	**110**	**120**	**65**	---	---	---	---	---	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Residential/Parkland Fine Sub-Surface [#2]			**120**	**220**	**240**	**130**	---	---	---	---	---	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Canada Wide Standards Surface [#3]			---	---	---	---	**210**	**150**	**1300**	**5600**	**5600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-16-4	24-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.089	0.0057	0.011	0.0058
	24-Sep-2016	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.080	< 0.0050	0.011	0.0058
	24-Sep-2016	3.5 - 4.0m	0.17	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	< 0.0050	< 0.0050
BIFP-16-4-TP	13-Mar-2016	1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	< 0.0050	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.12	0.0072	0.016	0.0081
	13-Mar-2016	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	0.0053	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.097	< 0.0050	0.010	0.0055
(Duplicate)	13-Mar-2016	2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	13-Mar-2016	3.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.079	< 0.0050	0.0089	< 0.0050
BIFP-16-5	24-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	51	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0072	< 0.0050	0.0058	< 0.0050	0.0060	< 0.0050	< 0.0050	0.12	0.011	0.021	0.011
	24-Sep-2016	2.5 - 3.0m	0.75	< 0.020	0.048	0.14	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0083	< 0.0050
	24-Sep-2016	3.0 - 3.5m	2.8	< 0.020	0.40	0.88	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	0.0095	0.0075	< 0.0050
	24-Sep-2016	4.0 - 4.5m	0.24	< 0.020	0.019	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0071	< 0.0050
BIFP-16-6	25-Sep-2016	1.7 - 2.5m	0.72	< 0.020	22	19	**1800** [#3]	**6100** [#3]	**13000** [#3]	4900	**21000** [#3]	0.26	0.45	0.18	0.092	0.058	0.12	0.12	0.082	0.36	0.033	0.14	**1.8** [#1]	0.021	**1.8** [#1]	**8.1** [#1]	**4.5** [#1]	0.56
(Duplicate)	25-Sep-2016	1.7 - 2.5m	1.0	< 0.020	22	20	**2900** [#3]	**8500** [#3]	**17000** [#3]	**6200** [#3]	**33000** [#3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Sep-2016	5.5 - 6.0m	0.024	< 0.020	0.034	< 0.040	< 12	13	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0055	< 0.0050	0.059	**0.015** [#2]	0.015	0.0055
	25-Sep-2016	7.0 - 7.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	17	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	**0.016** [#2]	0.014	< 0.0050
BIFP-16-7	25-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0078	< 0.0050	0.0063	< 0.0050	0.0062	< 0.0050	0.0064	0.14	0.011	0.021	0.012
	25-Sep-2016	2.5 - 3.0m	0.20	< 0.020	0.26	0.070	< 12	12	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	**0.15** [#1]	< 0.0050	< 0.0050
	25-Sep-2016	5.5 - 6.0m	0.013	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.082	0.0055	0.011	0.0060
BIFP-16-8	25-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	94	< 50	---	< 0.0050	< 0.0050	< 0.0040	0.0053	0.0081	< 0.10	0.015	< 0.0050	0.011	< 0.0050	0.011	0.0072	0.010	0.22	**0.017** [#1]	0.033	0.020
	25-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.093	0.0050	0.012	0.0072
	25-Sep-2016	4.0 - 4.5m	0.011	< 0.020	0.022	0.081	< 12	11	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.081	**0.025** [#2]	0.011	0.0060
BIFP-16-9	25-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	55	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0060	< 0.10	0.012	< 0.0050	0.0085	< 0.0050	0.0085	< 0.0050	0.0076	0.17	0.013 [#1]	0.028	0.016
	26-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.083	< 0.0050	0.010	0.0060
	26-Sep-2016	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	0.57	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0071	< 0.0050	0.0065	< 0.0050	0.0061	< 0.0050	< 0.0050	0.12	0.0091	0.022	0.011
BIFP-16-10	26-Sep-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	63	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0053	< 0.10	0.011	< 0.0050	0.0082	< 0.0050	0.0061	< 0.0050	0.0057	0.16	**0.018** [#1]	0.032	0.011
	26-Sep-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0083	< 0.0050
	26-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0064	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.080	0.0052	0.012	0.0063
BIFP-16-11	26-Sep-2016	0.2 - 0.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	16	260	290	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0052	< 0.10	0.011	< 0.0050	0.0071	< 0.0050	0.0076	0.0060	0.0083	0.15	0.012	0.022	0.016
	26-Sep-2016	1.0 - 1.5m	0.27	< 0.020	0.016	< 0.040	< 12	15	61	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0065	< 0.10	0.012	< 0.0050	0.0091	< 0.0050	0.0088	< 0.0050	0.0066	0.18	0.012	0.030	0.016
(Duplicate)	26-Sep-2016	1.0 - 1.5m	0.19	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	26-Sep-2016	2.0 - 2.5m	0.023	< 0.020	0.017	< 0.040	25	**1400** [#3]	**6800** [#3]	3000	**13000** [#3]	0.080	0.068	< 0.0040	0.066	0.036	< 0.10	0.072	< 0.0050	0.20	0.018	< 0.0050	**0.44** [#1]	0.022	0.91	**0.075** [#1]	**1.5** [#1]	< 0.0050

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																	
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50+})-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**60**	**110**	**120**	**65**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Residential/Parkland Fine Sub-Surface [#2]			**120**	**220**	**240**	**130**	**---**	**---**	**---**	**---**	**---**	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Canada Wide Standards Surface [#3]			---	---	---	---	**210**	**150**	**1300**	**5600**	**5600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-16-12	26-Sep-2016	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	170	130	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0076	< 0.0050	0.0078	< 0.0050	0.0066	< 0.0050	0.0054	0.13	0.013 [#1]	0.024	0.012
	26-Sep-2016	1.0 - 1.5m	0.084	< 0.020	0.072	< 0.040	93	10	51	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0062	< 0.10	0.012	< 0.0050	0.0091	< 0.0050	0.0091	0.0053	0.0082	0.19	**0.014** [#1]	0.031	0.017
	26-Sep-2016	2.2 - 2.7m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0071	< 0.0050
	26-Sep-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0062	< 0.0050
BIFP-16-13	01-Oct-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0060	< 0.10	0.012	< 0.0050	0.010	< 0.0050	0.0092	< 0.0050	0.0051	0.17	**0.021** [#1]	0.035	0.017
	01-Oct-2016	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0060	< 0.0050
	01-Oct-2016	3.0 - 3.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0067	< 0.0050	< 0.0050	< 0.0050	0.0075	< 0.0050	< 0.0050	0.098	**0.019** [#2]	0.019	0.012
BIFP-16-14	01-Oct-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0068	< 0.0050	0.0055	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.10	0.0099	0.016	0.0081
	01-Oct-2016	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0066	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.090	0.0087	0.017	0.0086
	01-Oct-2016	3.0 - 4.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	< 0.0050	< 0.0050
BIFP-16-15	01-Oct-2016	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	54	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0077	< 0.0050	0.0075	< 0.0050	0.0077	< 0.0050	0.0050	0.14	**0.014** [#1]	0.025	0.014
	01-Oct-2016	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0082	< 0.0050
BIFP-16-16	01-Oct-2016	0.0 - 0.5m	1.5	< 0.020	4.1	4.1	**710** [#3]	**2900** [#3]	**4900** [#3]	1700	**8000** [#3]	0.082	0.11	0.032	0.035	0.11	0.13	0.12	< 0.0050	0.10	< 0.0050	0.018	**0.43** [#1]	0.013	0.74	**1.9** [#1]	**0.93** [#1]	0.047
	01-Oct-2016	1.0 - 1.5m	1.6	< 0.020	0.28	1.7	100	**170** [#3]	260	78	---	0.0080	0.011	< 0.0040	0.0059	< 0.0050	< 0.10	0.0083	< 0.0050	0.011	< 0.0050	0.0092	0.053	0.0051	0.16	**0.38** [#1]	**0.12** [#1]	0.021
(Duplicate)	01-Oct-2016	1.0 - 1.5m	1.5	< 0.020	0.57	2.1	140	**290** [#3]	440	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01-Oct-2016	8.5 - 9.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	70	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.10	0.0076	< 0.0050	0.0070	< 0.0050	0.0087	< 0.0050	0.0052	0.13	0.0051	0.017	0.020
BIFP-16-HA1	04-Oct-2016	0.2 - 0.4m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	140	86	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-2016	0.8 - 1.1m	< 0.0050	0.032	< 0.010	< 0.040	< 12	< 10	190	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-2016	1.7 - 1.9m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-16-HA2	04-Oct-2016	0.4 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	11	210	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-2016	1.1 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	12	77	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-2016	1.7 - 1.9m	0.010	< 0.020	< 0.010	< 0.040	< 12	12	75	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-16-HA3	04-Oct-2016	0.4 - 0.6m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	220	190	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-2016	1.1 - 1.3m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	13	130	81	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-2016	1.8 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	82	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-17-1	25-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	66	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Sep-2017	4.5 - 5.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	25-Sep-2017	5.5 - 6.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-17-2	25-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	70	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0076	< 0.0050	0.0071	< 0.0050	0.0061	< 0.0050	< 0.0050	0.14	0.011	0.019	0.011

Advisian
WorleyParsons Group

Table 2

Soil Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Sampling Location	Date (dd-mmm-yyyy)	Sample Depth	Petroleum Hydrocarbons (PHCs)									PAH																	
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (Total) (mg/kg)	PHC F1 (C_6-C_{10}) - BTEX (mg/kg)	PHC F2 (C_{10}-C_{16}) (mg/kg)	PHC F3 (C_{16}-C_{34}) (mg/kg)	PHC F4 (C_{34}-C_{50}) (mg/kg)	PHC F4 (C_{34}-C_{50}+)-Gravimetric (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)Anthracene (mg/kg)	Benzo(a)Pyrene (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (mg/kg)	Benzo(a)Pyrene Total Potency Equivalent (CCME) (mg/kg)	Benzo(k)Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)Pyrene (mg/kg)	Calculate CCME IACR (none)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
CCME Residential/Parkland Fine Surface [#1]			**60**	**110**	**120**	**65**	---	---	---	---	---	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Residential/Parkland Fine Sub-Surface [#2]			**120**	**220**	**240**	**130**	---	---	---	---	---	**0.28**	**320**	**2.5**	**1**	**0.6**	**5.3**	**5.3**	**1**	**6.2**	**1**	**15.4**	**0.25**	**1**	**1**	**0.013**	**0.046**	**7.7**
CCME Canada Wide Standards Surface [#3]			---	---	---	---	**210**	**150**	**1300**	**5600**	**5600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CCME Canada Wide Standards Sub-Surface [#4]			---	---	---	---	**800**	**1000**	**3500**	**10000**	**10000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BIFP-17-3	25-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	58	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0074	< 0.0050	0.0069	< 0.0050	0.0062	< 0.0050	< 0.0050	0.14	0.011	0.019	0.012
	25-Sep-2017	4.0 - 4.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0071	< 0.0050	< 0.0050	< 0.0050	0.0051	< 0.0050	< 0.0050	0.12	0.0077	0.017	0.0099
	25-Sep-2017	5.0 - 5.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.086	< 0.0050	0.011	0.0056
BIFP-17-4	25-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0055	0.011	0.011	< 0.0050	0.0075	< 0.0050	0.0083	< 0.0050	0.0057	0.17	0.013 [#1]	0.025	0.015
	25-Sep-2017	2.0 - 2.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0061	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.059	< 0.0050	0.0068	< 0.0050
BIFP-17-5	25-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	12	290	160	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	0.0080	0.0081	< 0.0050	0.0087	< 0.0050	0.0073	< 0.0050	0.0065	0.15	0.012	0.022	0.016
	25-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	11	63	< 50	---	< 0.0050	< 0.0050	< 0.0040	0.0053	0.0073	0.014	0.014	< 0.0050	0.013	< 0.0050	0.012	< 0.0050	0.0075	0.23	**0.015** [#1]	0.034	0.021
BIFP-17-6	25-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	110	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0054	0.011	0.011	< 0.0050	0.0089	< 0.0050	0.0075	< 0.0050	0.0071	0.18	0.012	0.024	0.015
	25-Sep-2017	2.5 - 3.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.082	< 0.0050	0.0099	0.0057
BIFP-17-7	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	57	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0074	0.014	0.014	< 0.0050	0.011	< 0.0050	0.010	0.0054	0.0073	0.22	**0.024** [#1]	0.038	0.019
	26-Sep-2017	1.5 - 2.0m	< 0.0050	0.036	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	< 0.0050	< 0.0071	0.0068	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.099	0.013 [#1]	0.015	0.0070
BIFP-17-8	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	100	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0063	0.012	0.012	< 0.0050	0.0098	< 0.0050	0.0090	0.0050	0.0057	0.19	**0.021** [#1]	0.033	0.016
	26-Sep-2017	1.0 - 1.5m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0058	0.012	0.012	< 0.0050	0.0092	< 0.0050	0.0078	< 0.0050	0.0074	0.17	**0.023** [#1]	0.029	0.015
BIFP-17-9	26-Sep-2017	0.5 - 1.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	130	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0061	0.012	0.012	< 0.0050	0.010	< 0.0050	0.0094	0.0070	0.0061	0.19	**0.021** [#1]	0.036	0.017
	26-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	79	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0054	0.011	0.011	< 0.0050	0.010	< 0.0050	0.0084	0.0055	0.0054	0.18	**0.018** [#1]	0.032	0.015
(Duplicate)	26-Sep-2017	1.5 - 2.0m	< 0.0050	< 0.020	< 0.010	< 0.040	< 10	< 10	< 50	< 50	---	< 0.0050	< 0.0050	< 0.0040	< 0.0050	0.0054	0.011	0.011	< 0.0050	0.0087	< 0.0050	0.0079	< 0.0050	< 0.0050	0.16	**0.016** [#1]	0.029	0.015
TP11-6	10-Aug-2011	2.0 - 2.5m	1.1	< 0.020	0.030	< 0.040	28	**290** [#3]	920	---	2000	0.013	0.012	0.010	< 0.0050	< 0.0050	< 0.1	0.0072	< 0.0050	0.035	< 0.0050	0.016	0.056	< 0.0050	0.12	**0.073** [#1]	**0.095** [#1]	0.031

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
7. Superscript [#2] denotes values exceeding
   (CCME Canadian Environmental Quality Guidelines for Residential/Parkland, Fine-grained Sub-Surface soils, excluding Groundwater Check (drinking water) and Inhalation of Indoor Air Pathways, 1999 and updates)
8. Superscript [#3] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Surface Soils, excluding protection of potable groundwater, 2001 and updates)
9. Superscript [#4] denotes values exceeding
   (CCME Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for Residential/Parkland Land Use, Fine-grained Sub-Surface Soils, excluding protection of potable groundwater, 2001 and updates)

Advisian
WorleyParsons Group

Table 3

Water Analytical Results: Inorganic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	Chloride (mg/L)	pH (pH Units)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Phenols (µg/L)	Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
		Inorganic Parameters and Phenols					**Dissolved Metals**														
CCME CEQG Freshwater Aquatic Life [#1]		**120**	**(6.5 - 9)**	**3**	**0.06**	**4**	**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIFP-12-1-3	16-Aug-2012	8.6	7.93	< 0.0030	< 0.0030	**12** [#1]	0.0053	**0.010** [#1]	0.032	< 0.000025	< 0.0010	0.00096	**14** [#1]	< 0.00020	0.0083	0.012	0.00028	< 0.00010	< 0.00020	0.00097	0.0046
	22-Aug-2013	7.2	7.77	0.0090	0.0050	**14** [#1]	0.011	**0.0063** [#1]	0.025	< 0.000025	< 0.0010	0.00037	**6.1** [#1]	< 0.00020	0.0042	0.0092	0.00039	< 0.00010	< 0.00020	0.0029	0.0050
BIFP-12-2-3	16-Aug-2012	6.0	7.19	< 0.0030	< 0.0030	< 2.0	0.018	**0.0066** [#1]	< 0.020	< 0.000025	< 0.0010	0.00065	**35** [#1]	< 0.00020	0.0040	0.032	0.00070	< 0.00010	< 0.00020	0.0019	0.0096
BIFP-12-3-4	16-Aug-2012	70	7.64	**6.7** [#1]	0.022	< 2.0	0.0083	0.00076	0.032	**0.00039** [#1]	< 0.0010	0.0032	0.28	< 0.00020	0.0013	0.024	0.00067	< 0.00010	< 0.00020	**0.021** [#1]	0.018
BIFP-16-1-3	04-Oct-2016	6.6	7.66	< 0.010	< 0.010	**5.7** [#1]	0.0061	0.0039	< 0.020	< 0.000020	< 0.0010	0.00072	**2.4** [#1]	< 0.00020	0.0052	0.012	0.00031	< 0.00010	< 0.00020	0.0025	0.0040
	10-Aug-2017	5.5	---	0.031	< 0.010	3.6	0.0062	0.0015	0.095	0.000041	< 0.0010	0.0011	< 0.060	< 0.00020	0.017	0.0075	0.00034	< 0.00010	< 0.00020	0.0056	0.0034
BIFP-16-2-3	04-Oct-2016	1.6	7.75	< 0.010	< 0.010	3.3	0.0074	0.0047	0.047	< 0.000020	< 0.0010	0.00063	0.15	< 0.00020	0.0058	0.0077	0.00053	< 0.00010	< 0.00020	0.0020	0.0034
BIFP-16-3-3	04-Oct-2016	5.0	7.39	0.017	< 0.010	**13** [#1]	0.0063	**0.0059** [#1]	0.030	0.000020	< 0.0010	0.00069	**11** [#1]	< 0.00020	0.0047	0.020	0.00051	< 0.00010	< 0.00020	0.0041	0.0076
	10-Aug-2017	5.3	---	0.018	< 0.010	**6.1** [#1]	0.013	0.0011	0.097	0.000049	< 0.0010	0.0012	< 0.060	< 0.00020	0.014	0.0071	0.00033	< 0.00010	< 0.00020	0.0037	< 0.0030
BIFP-16-SW1	04-Oct-2016	4.7	7.99	0.010	< 0.010	< 2.0	---	---	---	---	---	---	0.16	---	---	---	---	---	---	---	---
	10-Aug-2017	4.7	---	0.027	< 0.010	**4.6** [#1]	---	---	---	---	---	---	0.098	---	---	---	---	---	---	---	---
	27-Sep-2017	4.5	---	< 0.010	< 0.010	---	0.0034	0.00050	< 0.020	< 0.000020	< 0.0010	0.00037	0.18	< 0.00020	0.0016	0.0012	< 0.00020	< 0.00010	< 0.00020	0.00024	< 0.0030
BIFP-16-SW2	04-Oct-2016	4.6	7.98	< 0.010	< 0.010	3.6	---	---	---	---	---	---	0.14	---	---	---	---	---	---	---	---
	10-Aug-2017	4.6	---	0.011	< 0.010	**4.5** [#1]	---	---	---	---	---	---	0.088	---	---	---	---	---	---	---	---
	27-Sep-2017	4.4	---	< 0.010	< 0.010	---	0.0031	0.00069	< 0.020	< 0.000020	< 0.0010	< 0.00020	0.24	< 0.00020	0.0015	0.0012	< 0.00020	< 0.00010	< 0.00020	0.00023	< 0.0030
BIFP-17-1-3	15-Oct-2017	5.4	---	< 0.010	< 0.010	---	---	---	---	---	---	---	**1.6** [#1]	---	---	---	---	---	---	---	---
BIFP-17-SW1	27-Sep-2017	4.2	---	< 0.010	< 0.010	---	0.0041	0.00064	< 0.020	< 0.000020	< 0.0010	0.00046	0.24	< 0.00020	0.0016	0.0012	< 0.00020	< 0.00010	< 0.00020	0.00023	< 0.0030
BIFP-17-SW2	27-Sep-2017	4.7	---	< 0.010	< 0.010	---	0.0033	0.0010	< 0.020	< 0.000020	< 0.0010	< 0.00020	**0.44** [#1]	< 0.00020	0.0015	0.0013	< 0.00020	< 0.00010	< 0.00020	0.00023	< 0.0030
BI SW09	06-Sep-2010	3	7.55	< 0.003	< 0.003	< 2	---	---	---	---	---	---	< 0.06	---	---	---	---	---	---	---	---
	21-Aug-2011	4	7.88	< 0.003	< 0.003	< 2	---	---	---	---	---	---	0.21	---	---	---	---	---	---	---	---
	15-Aug-2012	5.2	7.78	0.012	< 0.0030	**14** [#1]	---	---	---	---	---	---	0.11	---	---	---	---	---	---	---	---
	22-Aug-2013	2.7	---	0.0080	0.0050	**15** [#1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Aug-2014	3.0	---	0.011	< 0.010	3.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Aug-2015	7.5	---	< 0.010	< 0.010	2.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 4

Water Analytical Results: Total Metals

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	Total Metals														
		Aluminum (mg/L)	Arsenic (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.1**	**0.005**	**1.5**	**0.00009**	**0.0089**	**0.004**	**0.3**	**0.007**	**0.073**	**0.15**	**0.001**	**0.00025**	**0.0008**	**0.015**	**0.03**
BIFP-16-SW1	04-Oct-2016	**0.45 [#1]**	0.0029	< 0.020	**0.0010 [#1]**	0.0010	0.0026	**3.3 [#1]**	0.0014	0.0026	0.0042	0.00023	< 0.00010	< 0.00020	0.00064	0.013
	10-Aug-2017	0.061	0.0013	< 0.020	0.000038	< 0.0010	0.00050	**0.52 [#1]**	< 0.00020	0.0025	0.0014	< 0.00020	< 0.00010	< 0.00020	0.00037	< 0.0030
	27-Sep-2017	**0.13 [#1]**	0.0045	< 0.020	**0.000097 [#1]**	< 0.0010	0.0015	**6.1 [#1]**	0.00028	0.0012	0.0031	< 0.00020	< 0.00010	< 0.00020	0.00028	0.010
BIFP-16-SW2	04-Oct-2016	**1.6 [#1]**	0.0035	< 0.020	**0.00019 [#1]**	0.0029	**0.0040 [#1]**	**5.4 [#1]**	0.0020	0.0024	0.0070	0.00025	< 0.00010	< 0.00020	0.00064	0.027
	10-Aug-2017	0.041	0.0011	< 0.020	< 0.000020	< 0.0010	0.00045	**0.32 [#1]**	< 0.00020	0.0020	0.0015	< 0.00020	< 0.00010	< 0.00020	0.00044	< 0.0030
	27-Sep-2017	0.033	0.00073	< 0.020	< 0.000020	< 0.0010	0.00050	**0.39 [#1]**	< 0.00020	0.0016	0.0013	< 0.00020	< 0.00010	< 0.00020	0.00025	< 0.0030
BIFP-17-SW1	27-Sep-2017	0.016	0.00070	< 0.020	< 0.000020	< 0.0010	0.00041	**0.34 [#1]**	< 0.00020	0.0016	0.0014	< 0.00020	< 0.00010	< 0.00020	0.00023	< 0.0030
BIFP-17-SW2	27-Sep-2017	**2.3 [#1]**	**0.016 [#1]**	< 0.020	**0.00036 [#1]**	0.0061	**0.0071 [#1]**	**22 [#1]**	0.0037	0.0020	0.011	0.00034	< 0.00010	< 0.00020	0.00057	**0.043 [#1]**
BI SW09	15-Aug-2012	**3.5 [#1]**	**0.11 [#1]**	< 0.20	**0.0013 [#1]**	**< 0.050 [#1]**	**0.033 [#1]**	**1600 [#1]**	**< 0.010 [#1]**	0.031	0.055	**< 0.010 [#1]**	< 0.0050	< 0.010	< 0.0050	**< 0.15 [#1]**
	22-Aug-2013	0.021	0.0011	< 0.020	< 0.000025	< 0.0010	0.00038	**0.77 [#1]**	< 0.00020	0.0023	0.0016	0.00039	< 0.00010	< 0.00020	0.00025	< 0.0030
	04-Aug-2014	**1.5 [#1]**	0.0046	< 0.020	**0.00017 [#1]**	0.0030	**0.0060 [#1]**	**15 [#1]**	0.0022	0.0040	0.0085	0.00039	< 0.00010	0.00023	0.00073	0.028
	09-Aug-2015	0.0083	0.00051	< 0.020	0.000025	< 0.0010	0.00039	0.21	< 0.00020	0.0014	0.0012	< 0.00020	< 0.00010	< 0.00020	0.00023	0.0039
	08-Aug-2016	0.074	0.00097	< 0.020	0.000025	< 0.0010	0.00034	**0.89 [#1]**	< 0.00020	0.0015	0.0014	< 0.00020	< 0.00010	< 0.00020	0.00015	< 0.0030
	10-Aug-2017	**0.64 [#1]**	**0.0092 [#1]**	< 0.020	**0.00016 [#1]**	0.0017	0.0022	**23 [#1]**	0.0030	0.0026	0.0072	0.00033	< 0.00010	< 0.00020	0.00088	0.016

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Superscript [#1] denotes values exceeding

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Advisian
WorleyParsons Group

Table 5

Water Analytical Results: Organic Parameters

PROJECT No.: 407011-00622-400

Monitoring Station	Date (dd-mmm-yyyy)	PHC						PAH								
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	PHC F1 (C^{6}-C^{10}) - BTEX (mg/L)	PHC F2 (C^{10}-C^{16}) (mg/L)	Acenaphthene (mg/L)	Anthracene (mg/L)	Benzo(a)Anthracene (mg/L)	Benzo(a)Pyrene (mg/L)	Fluoranthene (mg/L)	Fluorene (mg/L)	Naphthalene (mg/L)	Phenanthrene (mg/L)	Pyrene (mg/L)
CCME CEQG Freshwater Aquatic Life [#1]		**0.37**	**0.002**	**0.09**	**---**	**---**	**---**	**0.0058**	**0.000012**	**0.000018**	**0.000015**	**0.00004**	**0.003**	**0.0011**	**0.0004**	**0.000025**
BIFP-12-1-3	16-Aug-2012	**0.51** [#1]	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	22-Aug-2013	0.13	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-12-2-3	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-12-3-4	16-Aug-2012	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-16-1-3	04-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.000090	< 0.000020
	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-16-2-3	04-Oct-2016	0.00069	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.00010	< 0.000020
BIFP-16-3-3	04-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	0.000095	< 0.000020
	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-16-SW1	04-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-16-SW2	04-Oct-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	< 0.00010	< 0.000010	< 0.0000085	< 0.0000075	< 0.000010	< 0.000050	< 0.00010	< 0.000050	< 0.000020
	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-17-1-3	15-Oct-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-17-SW1	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BIFP-17-SW2	27-Sep-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---
BI SW09	22-Aug-2013	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	04-Aug-2014	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	09-Aug-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	08-Aug-2016	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.1	< 0.10	---	---	---	---	---	---	---	---	---
	10-Aug-2017	< 0.00040	< 0.00040	< 0.00040	< 0.00080	< 0.10	< 0.10	---	---	---	---	---	---	---	---	---

NOTES:
1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters above applied guideline.
4. Highlighting indicates non-detect parameters above applied guideline.
5. Highlighting indicates parameters at applied guideline.
6. Benzo(a)Pyrene Total Potency Equivalent (ESRD)

(CCME. 2015. Canadian Environmental Quality Guidelines Summary Table. Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Sept, 2015.)

Appendix 12 Norman Wells Closure and Reclamation Work Areas Summary



Appendix 12
Norman Wells C&R Work Areas Summary

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
Mainland West											
Former Battery #1 (LH1 Area)	MW-2	1999	2008	2008	2008, 2010	2008-2013	circa 1980			Phase 2 assessment partially complete.	
CPF	MW-7	1999	2008		1997, 1998, 2006, 2008, 2009	1997-present				Partial phase 2 delineation.	Groundwater Monitoring.
CPF Flare Stack	MW-8		2008		1998, 2008, 2009	1998-present				Partial phase 2 delineation.	Groundwater Monitoring.
C-27X Wellsite	MW-10				2013		2015			Flowline break assessment completed in 2013. Well head cut and capped in 2015, above-ground infrastructure removed. Preliminary Phase 2 completed.	
Historical AST E of E-26X Wellsite	MW-18	1999, 2016	2008							Identified during aerial photograph review. Not investigated.	
D-27X Utilidor	MW-18	1999	2008	2008	2008	2008-2013				Phase 2 delineation complete.	Groundwater Monitoring.
E-27X Wellsite	MW-11	1999	2008	2013	2008, 2009	2008-present	2014			Well cut and capped in 2014, above-ground infrastructure was removed. Preliminary Phase 2 ESA completed.	Groundwater Monitoring.
F-28X Wellsite	MW-3	1999	2008	1997, 2009	1997, 1998, 2009, 2010	1997-2015				Phase 2 delineation partially complete, Screening Level Risk Assessment complete.	Develop Management Plan.
F-29X & G30X Wellsites	MW-5	1999	2008	2008	2008, 2009, 2010, 2016	2010-2011				Phase 2 delineation complete, Screening Level Risk Assessment complete. Supplementary Phase 2 ESA conducted in 2016.	Develop Management Plan.
Former Pit/Tank/Dump Site Near LT3	MW-4		2008		2010					Partially delineated.	
Historical Laydown/Camp Area W of CPF	MW-6		2008							Identified during aerial photograph review. Not investigated.	
Historical Excavation by Drill Rig Site by G-22X	MW-12	2016								Identified during aerial photograph review. Not investigated.	
Former AST and Pit W of Cemetery Sump	MW-13	2016			2016					Preliminary Phase 2 ESA conducted in 2016.	Supplemental Phase 2 ESA.
Historical Tank Farm W of E-26X	MW-14	2016								Identified during aerial photograph review. Not investigated.	
Historical AST and Pit N of H-29X	MW-15	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit SE of G-30X	MW-16	2016								Identified during aerial photograph review. Not investigated.	
Historical AST W of Settling Pond/CPF	MW-17	2016								Identified during aerial photograph review. Not investigated.	
Historical AST N of E-25X	MW-19	2016								Identified during aerial photograph review. Not investigated.	
Potential historical dump site S of F-28X	MW-20	1999, 2008								Identified during aerial photograph review. Not investigated.	
Mainland Central											
Former A&R Biocell (ARB) Area	MC-16		2008		2008, 2009, 2010, 2012, 2013	2008-present		2013-present	2016-2017	Phase 2 ESA delineation of historic hydrocarbon issue south of A&R Biocell complete. Biocells A and B decommissioned and reconstructed as larger cell (Biocell 1) in 2012. Remedial excavation of historic hydrocarbon impacts to south initiated in 2013 and continued through to 2016. Reseeding of backfilled excavation area in 2016-2017.	Groundwater Monitoring. Vegetation Monitoring.
Biocell 1	No APEC assigned, engineered lined cell. Historical impact unrelated to cell covered by MC-16				2012, 2013	2012-present				Biocell 1 constructed in 2012. Replaced decomissioned A&R Biocells A and B. Ongoing treatment of hydrocarbon affected soils.	Soil treatment by twister bucket. Groundwater Monitoring.
Biocell 2	No APEC assigned, engineered lined cell				2015	2015-present				Biocell 2 constructed in 2014 in former "Yard D" area. Ongoing treatment of hydrocarbon affected soils.	Soil treatment by twister bucket. Groundwater Monitoring.

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
B-33X Wellsite	No APEC assigned. No residual impact related to well operation.	1999	2008		2010, 2017	2010-2014, 2017	2009-2010			Well abandoned in 2009, above-ground infrastructure removed and Phase 2 completed in 2010. Soil washing treatment pad constructed in 2015. Phase 2 ESA completed in 2017.	Soil washing/treatment of Battery #3 soils. Groundwater monitoring.
Battery #3 (incl. Process Area)	MC-22	1999	2008	pre-2008, 2008	1993, 1997, 1998, 1999, 2000-2003, 2008, 2013	1997-present	1997-1998	1996, 1999, 2000, 2002		Metals removal from Process Area completed in 1999. Phase 2 delineation complete, completed Screening Level Risk Assessment. Sampled Tank Farm and Flare	Groundwater Monitoring. Develop Management Plan for BT3.
Landfarm, Debris Storage and Dump Site North of Battery #3 Flare Pit	MC-17		2008	2011	1998, 2010, 2011			1996-2004		Hand sampling completed in 2010, test pit sampling completed in 2011; further investigation of dump site required.	Soil Monitoring for Closure Reporting for Landfarm area; develop management plan for debris storage/dump site.
Battery #3 Flare Pit	MC-18	1999	2008		2003, 2008, 2012, 2014, 2017			2002, 2016		Metals impacted soil removal completed in 2002. 2012 and 2014 supplementary Phase 2 sampling completed. Source removal excavation initiated in 2016. Supplementary Phase 2 ESA completed in 2017.	Groundwater monitoring.
Battery #3 Wax Pit	Included with MC-22							1999 (HC removal)	1999		
PCB & Mercury Storage Facility	No APEC assigned						1996				
Bosworth Creek Weir	No APEC assigned	1999	2008		2007		2005			Complete, weir removed in 2005.	
Bosworth Creek East Bank	MC-19	1999	2008	2008	1998, 2000, 2006, 2008, 2010, 2013	1998-present		2008, 2009	2008, 2009, 2012, 2014-2017	Complete aquatics monitoring, Bank stabilization activities completed in 2012. New drivepoints in 2013. Bank revegetation activities in 2014 and 2015. Reseeding through erosional area completed in 2016, vegetation assessment completed in 2017.	Monitor restored bank for stability, revegetation activities as needed, filling transverse cracks, reinstalling silt fence. Groundwater Monitoring.
Bosworth Creek Delta (E-32X Area)	MC-2	1999	2008	pre-2008, 2008	1997, 1998, 1999, 2000, 2001, 2007, 2009, 2010	1997-2014				Further delineation required.	
Bosworth Creek Delta (Well #6 Near D-34X)	MC-14		2008		2001, 2009, 2010	2001-2014				Site visit conducted. Further delineation required.	
Bosworth Creek Delta (D-36X-1 Area)	MC-20		2008		2001, 2008, 2010					Further delineation required.	
E-33X Area - Potential historical dump site, potential grave site	MC-9			pre-2008, 2013	2013 (by Operations)					Proven during Operations work, no investigation to date.	
Two historical pits N of F-33X	MC-5	1999	2008	pre-2008	2009, 2010					Preliminary investigation - hydrocarbons may be due to natural seeps.	
C-32X Wellsite	MC-7	1999	2008	2008	1996, 1997, 2007, 2008	2013-present		1996 (Flowline spill site)	1997	Phase 2 delineation complete.	Groundwater Monitoring.
Potential Buried Pit near C-34X	MC-41	1999	2008	2008						Not investigated.	
F-31X Wellsite and Area	MC-3	1999	2008		1997, 1998, 2000, 2002, 2007, 2010	1997-present		1999 (Flowline spill site)	2000	Phase 2 delineation complete on flowline spill, former dump site to northwest of F-31X.	Groundwater Monitoring.
North of F-31X (buried metal)	MC-1		2008		2010					Limited Phase 2 ESA completed.	
G-32X Wellsite and Area	MC-4	1999	2008		2009, 2010	2009-present				Partially delineated.	Groundwater Monitoring.
LT11 Satellite Building	MC-21	1999	2008	pre-2008, 2008	1997, 2004-2005, 2008	1997-2013				Further delineation required	
Tank 53 Area	MC-8	1999	2008		1999, 2002		2001-2002	2004-present	2009, 2010	Soil remediation partially complete, revegetation in progress	Closure monitoring of vegetation and subsidence.
Tank 401 Area	MC-11	1999	2008		1999, 2002, 2006		2001	2010-2011	2011, 2012	Excavated, treated and backfilled soil, regraded surface in 2011. Recontoured & seeded in 2012.	Monitor vegetation, repair any subsidence.
Tank 401 Pumphouse	MC-12		2008		2010					Limited Phase 2 investigation completed	
D-32X Wellsite	MC-10	1999	2008	pre-2008	2009	2009-2013				Investigated, no issues identified.	
Well Services Yard & Warehouses	MC-6, MC-26	1999	2008		1997, 2013	1997-present		1997-present		Further delineation required.	Groundwater Monitoring.
C-30X Wellsite	MC-27		2008		2010	2010-present				Preliminary Phase 2 investigation; delineation required.	Groundwater Monitoring.
B-30X Wellsite	MC-23		2012	2012	2012, 2013, 2015, 2017	2012-present	2012			Well abandoned. Cut and capped in 2012, Phase 2 assessment completed in 2013. Phase 2 sampling completed in 2015 and 2017.	Groundwater monitoring. Develop delineation and management plan.
E-33X Wellsite	MC-45			2013	2016, 2017		2014	2014		Well cut and capped in 2014, aboveground infrastructure removed. Preliminary Phase 2 ESA was completed. Supplementary Phase 2 ESAs completed in 2016 and 2017.	Reclamation as required to meet CCME Industrial Land Use Standards.
Former pit(s) SW of D-34X on Bosworth banks	MC-15	1999	2008		2009					Limited Phase 2 ESA completed. Further delineation required.	
Possible grave site S of Tank 401 Pumphouse	MC-13		2008							Anecdotal information from site interviews. Not investigated.	
Historical AST Northeast of Biocell 2	MC-24	2016								Identified during aerial photograph review. Not investigated.	
Former Helicopter Pad	MC-25	2016			2010					Identified during aerial photograph review. Not investigated under pad, limited investigation to East of pad.	
Material (metal, wood debris) pushed over bank, NW of F-31X Injection Facility and potentially extending to N of D-31X	MC-28	2016								Identified during aerial photograph review. Not investigated.	
Bermed area S of F-31X Injection Facility	MC-29	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit SW of H-31X	MC-30	2016								Identified during aerial photograph review. Not investigated.	

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
Historical Pit NW of F-33X	MC-31	2016								Identified during aerial photograph review. Not investigated.	
Historically cleared and bermed area W of Tank 401 pump building	MC-32	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit at D-35-1X	MC-33	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit E of F-35X	MC-34	2016								Identified during aerial photograph review. Not investigated.	
Historical Building and AST E of Battery #3	MC-35	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit at SW corner of Battery #3 Flare Pit	MC-36	2016			2016			2016		Excavated during remedial works at adjacent Battery #3 Flare Pit.	
Historical AST along road NE of Battery #3 Flare Pit, NW of C-34X wellsite	MC-37	2016		2011						Identified during aerial photograph review and geophysical investigations. Not assessed.	
Historical ground disturbance S of D-34X	MC-38	2016								Identified during aerial photograph review. Not investigated.	
Potential dump site S of Biocells and Warehouse Access Road	MC-39	1999	2008		2014-2016					Partially investigated during remedial excavation works for Biocell area.	
Potential buried pit NE of E-32-1X	MC-40	1999	2008							Identified during aerial photograph review. Not investigated.	
Historical flowline release N of D-36X	MC-42				1993, 2002					Very limited Phase 2 ESA sampling conducted to date, West of spill area.	
Potential Historical spill site SE of C-30X	MC-43				2010					Limited Phase 2 ESA completed (one borehole).	
Potential grave site SE of D-36X	MC-44									Anecdotal information from site personnel. Not investigated.	
Mainland East											
Former Refinery	ME-7	1999	2008	pre-2008	1993, 97, 98, 99, 2000, 2002, 2003, 2008, 2009, 2012, 2013, 2017	1993-present	1996-1997	1999, 2002 excavations		Phase 2 delineation complete, Screening Level Risk Assessment complete. In-situ remediation at Refinery Bank area from 2003 to present. Additional monitoring wells installed between former Refinery and Mackenzie River in 2017.	Groundwater Monitoring, operation of in-situ systems.
API Separator	ME-8	1999	2008		2003, 2009	2003-present	1997	1997	1997	Partially delineated.	Groundwater Monitoring.
B-38X Well Area	ME-6	1999	2008	pre-2008	1993, 1997, 1998, 1999, 2000, 2002, 2003, 2008, 2012	1997-present	1992 ongoing	2004-present		In-situ DPE remediation system active seasonally, upgrades and expansion in 2009, expanded solar panel water heater capacity in 2012. Completed 2012 soil & GW sampling to verify current PHC levels in-situ at FTA, LT7, B38.	Groundwater Monitoring, operation of in-situ remediation system.
B-40X Wellsite	Also ME-6	1999	2008		2003, 2008, 2010	2003-present				Phase 2 delineation completed in 2010.	Groundwater Monitoring.
C-36X Wellsite and Historical Dump Site	ME-2	1999	2008		2009, 2010	2009-present				Phase 2 delineation mostly completed in 2010.	Groundwater Monitoring.
C-38X Wellsite	ME-3	1999	2008		1997, 2006, 2008	2008-present		2005		Verification soil sampling at Line 405 Break; Phase 2 delineation complete.	Groundwater Monitoring.
D-42X Wellsite	ME-22				2012					Preliminary Phase 2 ESA completed, impacts proven but not delineated.	
D-44X Wellsite	ME-21	1999	2008	2008	2008, 2009			2010		Remediation complete.	
F-50X Wellsite	No APEC assigned	1999	2008		1997					Surficial sampling/delineation near wellhead completed in 1997. Operational well so no further intrusive work.	
B-42X Wellsite	ME-15	1999	2008	2013	2006, 2010, 2017	2017	2014			Phase 2 delineation completed in 2010, geophysical investigation completed in 2013, wellhead/flowline cut and cap and limited Phase 2 completed in 2014. Supplementary Phase 2 completed in 2017.	Reclamation as required to meet CCME Industrial Land Use Standards. Groundwater monitoring.
B-35X Wellsite	ME-27		2012	2012	2012	2012-present	2012			Well abandoned. Cut and capped in 2012, Phase 2 assessment of wellhead area complete in 2012. Ground disturbance and former AST area identified during aerial photograph review to W of wellhead, not investigated.	Groundwater Monitoring.
Fire Training Area	Also ME-6	1999	2008	pre-2008	1993, 1998, 1999, 2000, 2003, 2008, 2012	1998-present	1992-2008	2008-present		In-situ DPE remediation system active seasonally, upgrades and expansion in 2009. Upgrades ongoing to engineered system in 2013-2014.	Groundwater Monitoring, Operation and Optimization of In-situ Remediation System.
Former Pits (South of B-39X)	ME-5		2008		2009, 2010					Phase 2 delineation incomplete.	
Reduced Crude Flare Pit	ME-10	1999	2008	pre-2008	1993, 1998, 1999, 2003, 2009	1998-present	2002	2002, 2003	2004	Phase 2 delineation completed.	Groundwater and Vegetation Monitoring.
Potential Dump Site SW of RCFP	ME-34	1999	2008		2015					Preliminary Phase 2 test-pitting completed in 2015, proven but not delineated.	

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
Refinery Bank, Seeps, Former Flare pit	ME-17	1999	2008	pre-2008	1993, 1998, 1999, 2001, 2003, 2008, 2009, 2010, 2012, 2013	1998-present		1999, 2003-present		In-situ remediation system active, groundwater pumping system upgraded to run year-round in 2012, MPE running seasonally, Screening Level Risk Assessment complete, soil & gw sampling. Drilling on beach area in 2013. Upgrades to engineered systems ongoing 2013-14.	Groundwater monitoring, operation and optimization of in-situ remediation system.
Historical Dump site SW of Seepage Lake	MO-1	1999								Anecdotal evidence from site interviews. Not investigated.	
Seepage Lake	MO-2	1999								Anecdotal evidence from site interviews. Not investigated.	
Historical Dump site at West end of Airport Runway (S Side)	MO-3	1999, 2016								Identified during aerial photograph review. Not investigated.	
Airport Landfill (N Side)	MO-5	1999	2008	pre-2008	1998	1998-2013				Preliminary Phase 2 complete.	
Airport Landfarm	MO-4	1999	2008					1996-2004		Closure report complete.	
Potential buried crushed barrels, SW of Mainland Sumps Area	MO-6	1999	2008							Anecdotal evidence from site interviews and IOL map of known historical dump sites. Not investigated.	
Potential historic drainage ditch between Seepage Lake and Bosworth Creek	MO-7	1999	2008							Anecdotal evidence from site interviews. Not investigated.	
Mainland Tank Farm	ME-12	1999	2008		1993, 1997, 1998, 2001, 2002, 2003	1997-present				Phase 2 delineation partially complete, installed 2 thermistors in the area in 2013.	Groundwater Monitoring.
Historical Dump Site (NE of C-34-1X)	ME-1		2008		2010					Preliminary investigation using hand auger, no issues identified.	
Former Garage Site on Refinery at NWPC Yard	ME-9		2008		2010	2010				Phase 2 Assessment complete.	
Former pipe racks and storage yard in Mainland Tank Farm	ME-13		2008							Anecdotal evidence from site interviews. Not investigated.	
Former Drum Storage South of NWPC Yard	ME-20		2008		2010	2010				Partially delineated.	
Bermed Area in NE corner of Flint Yard	ME-25	2016								Identified during aerial photograph review. Not investigated.	
ASTs formerly situated at S side of Flint Yard		2016								Identified during aerial photograph review. Not investigated.	
Former Fueling Site near Flint shop	ME-19		2008		2010	2010-present				Partially delineated.	Groundwater Monitoring.
Former Camp Site near Flint shop	ME-18		2008		2009	2009-present				Phase 2 Assessment complete.	Groundwater Monitoring.
Potential Historical Pit and Debris N of Mainland Tank Farm	ME-11		2008	pre-2008	2009					Preliminary Phase 2 completed, no issues identified.	
Historical Dump Site NE of Reduced Crude Flare Pit	ME-14		2008							Anecdotal evidence from site interviews. Not investigated.	
Old Well #3	ME-16		2008							Anecdotal evidence from site interviews. Iinspected in 2013, no visual surface impression of former well site.	
Historical Storage Area E/SE of C-44X	ME-23	2016								Identified during aerial photograph review. Not investigated.	
Wireline Shop and Contractor Shop	ME-24	2016								Not investigated.	
Unknown historical structure on Embankment, Location of Discovery Well #1, SW of C-37X	ME-28	2016								Identified during aerial photograph review. Not investigated.	
Unknown historical structures on Embankment, W of D-39X	ME-29	2016								Identified during aerial photograph review. Not investigated.	
Former ASTs N of D-39X	ME-30	2016								Identified during aerial photograph review. Not investigated.	
Bulk Sales Yard	ME-31	2016								Identified during aerial photograph review. Not investigated.	
Storage Area E of B-42X	ME-32	2016								Identified during aerial photograph review. Not investigated.	
Historical AST N of road past C-38X pad to Tank Farm	ME-33	2016								Identified during aerial photograph review. Not investigated.	
Potential Old Warehouse site W of D-41X	ME-35	1999	2008							Anecdotal evidence from site interviews. Not investigated.	
Sheet Pile and Metal Debris N of C-41X	ME-36	1999	2008							Anecdotal evidence from site interviews. Not investigated.	
Former Drill Pad N of 8-Bay Building	ME-38	2016								Identified during aerial photograph review. Site visit conducted and surface solids sample collected.	

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
Sumps											
Mainland Drilling Sump	MS-1	1999	2008, 2012	2008, 2013	1992, 1993, 1997, 1998, 2002, 2008, 2009, 2012, 2013	1997-present	2006	2007, 2008	2008	Decommissioned, contained and capped with surface restoration as of 2009. Phase 2 ESA complete. Placement of fill and re-contouring of areas with identified depressions to prevent surface water collection in 2014.	Preparation of long term Sump Management Strategy. Vegetation and groundwater monitoring.
Well Services Sump	MS-2	1999	2008	2008	1998, 2002, 2009	1998-present	2006	2007, 2008, 2009	2009	Decommissioned, remediated, restored as of 2009, Phase 2 ESA complete.	Preparation of long term Sump Management Strategy. Vegetation and groundwater monitoring.
Mainland Sumps 1 to 6	MS-3	1999	2008	2008	1997, 1998, 2002, 2009, 2010, 2012, 2013	1997-present				Decommissioned and capped. Phase 2 ESA complete. Long term management strategy developed in 2014. Fluids removed from Sumps 2, 3 and 4 and depression areas backfilled with clean soil in 2014. Further fluid removal and depression backfilling in 2015 and 2016.	Preparation of long term Sump Management Strategy. Vegetation and groundwater monitoring.
B-38X Buried Pit/Sump	ME-4	1999	2008	Pre-2008, 2009	1997, 1999, 2000, 2002, 2003, 2006-2007, 2010	1997-present		2007-2008	2008-2009	Surface restoration complete, delineation drilling to south of former sump in 2010. Further delineation required.	Vegetation, Groundwater Monitoring.
C-27X Sump	MW-9	1999	2008	2005, 2008	2008, 2009, 2013, 2016	2008-present		2015-2016		Discontinued and capped. Supplementary Phase 2 ESA works conducted in 2014. Fluid removed and depression backfilled in 2015. Supplementary Phase 2 ESAs completed in 2015 and 2016, final sump capping in 2016.	Assess sump cap for settling. Groundwater Monitoring.
Cemetery Sump	MW-1	1999	2008	2005, 2013	2005, 2008, 2009, 2010, 2013	2008-present		2010	2010	Phase 2 delineation complete, recontouring and interim capping completed 2010, screening Level Risk Assessment completed 2010. Thermistor installed to characterize permafrost.	Vegetation & groundwater monitoring, development of long term management strategy.
Bear Island Sumps 1 to 6	BI-4 and BI-15	1999	2008	pre-2008, 2013	1997, 1998, 2002, 2008, 2009, 2010, 2013, 2014, 2016, 2017	1997-present				Decommissioned and capped. Supplemental Phase 2 ESA works conducted in 2014-2017.	Continued Phase 2 ESA works. Groundwater and vegetation monitoring, development of long term management strategy.
Bear Island											
Former Tank Farm at B.I.T.#5	BI-18	1999	2008		2010	2010-present				Preliminary Phase 2 ESA (one borehole). Further investigation required.	Groundwater Monitoring.
O-45X/O-46X Well Sites (former spill sites)	BI-14	1999	2008	pre-2008, 2008	1997, 1998, 2008, 2009, 2010	1997-present		1997, 1998		Further delineation required.	Groundwater Monitoring.
1979 Landfarm Area	No APEC assigned	1999	2008	2008				1979			
Former Battery Site and Tank Farm Near N-42X	BI-11	1999	2008	2010	1998, 2002, 2009, 2010	1998-present				Further delineation required.	Groundwater Monitoring.
N-42X Well Site (former spill site)	No APEC assigned	1999	2008	pre-2008		2009-present				Phase 2 assessment complete.	Groundwater Monitoring.
Former Battery West of Q-34X (BIBT1 area)	BI-3	1999	2008	pre-2008	2008, 2009, 2010, 2012, 2014, 2016, 2017	2009-present		2014-2015		Phase 2 and remedial excavation works completed in 2014 and 2015. Supplemental Phase 2 ESAs completed in 2015, 2016, and 2017.	Continued Phase 2 delineation works. Develop management plan. Groundwater monitoring.
Tank Farm Near Q-38X	BI-7		2008		2010					Minor surface impacts identified. Area lined/bermed.	
Former Tanks South of R-36X	BI-17		2008		2015-2016	2015-present				Brush clearing, testpit and soil sampling in 2015. Supplemental Phase II ESA works in 2016.	Groundwater Monitoring.
Bear Island Flare Pit (North of N-42X)	BI-10		2008	2011	2011, 2012, 2016, 2017	2012, 2016-present		2014		Remedial excavation for source removal and supplemental Phase 2 ESA works undertaken in 2014. Further Phase 2 ESA works undertaken in 2016 and 2017.	Reclamation as required to meet CCME Parkland Standards. Groundwater monitoring.
Bear Island #1 Well Site, West End	BI-1		2008, 2012	2012	2010, 2012	2012-present				Well abandonment/cut&cap complete. Phase 2 assessment complete. Armouring and PHC soil around wellhead removed.	Groundwater monitoring.
B.I.T.#4 Pigging Station	BI-8		2008		2010					Proven but not delineated.	
Historical Tanks and Buildings W of Sump #1	BI-2		2008		2009, 2010, 2011					Limited investigation; no soils impacts identified, but debris visible in brush.	
Former Tank Farm N of Sump #3	BI-5	1999								Identified during aerial photograph review. Not investigated.	
Former Fuel Storage Area SW of P-37X	BI-6	1999			2015					Proven but not delineated. Area was lined, impacts expected to be confined to surface soil.	
B.I.T.#4 Flowline Break	BI-9		2008							Potential, not investigated.	
Historical Spill Site E of N-44X	BI-12				1998, 2009					Proven, delineated and remediated.	
Historical Spill Site N of N-45X	BI-13				1998, 2009					Proven, delineated and remediated.	
M-43X Line Break	BI-16							2011-2012		RAP developed, site remediated.	
Former Storage Area at Q Pad	BI-19	1999, 2016	2008	2008	2008					Identified during aerial photograph review. Not investigated.	
Historical Pit near P-37X	BI-20	2016								Identified during aerial photograph review. Not investigated.	

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
Unexplained Clearing near P-38X	BI-21	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit near N-39X	BI-22	1999, 2016	2008		2008					Preliminary Phase 2 ESA. Further investigation required.	
Historical Pit / Soil Pile near O-43X	BI-23	2016								Identified during aerial photograph review. Not investigated.	
Historical Pit near N-45X	BI-24	2016								Identified during aerial photograph review. Not investigated.	
Unexplained Clearing near O-46X	BI-25	2016	2008							Identified during aerial photograph review. Not investigated.	
Former AST Location SE of Sump #1	BI-26		2008		2015-2016	2016				Preliminary Phase 2 ESA. Further investigation required.	Groundwater Monitoring.
Pipeline release at O-43X	BI-27				2015	2015-2016				Proven, not delineated. Drive point piezometers installed between release and Unnamed Creek in 2015. Further investigation required.	Groundwater Monitoring.
Pipeline release at Q-43X	BI-28				2015					Proven, not delineated. Further investigation required.	
Frenchy's Island											
Well Site, Frenchy's Island East End	FI-1		2008		2010	2010				Phase 2 assessment complete, piezometers destroyed by ice, no further GW monitoring needed.	
Goose Island											
Former Borrow Area (T-10X Area)	No APEC assigned	1999	2008	2008	2009	2009-2010				Phase 2 delineation complete.	
Former Camp Site NE of Q-10X	GI-2	1999	2008		2009					Investigated, no issues identified.	
Former Drilling Sumps (Sump 2, P-9X Area)	GI-3	1999	2008		2009	2009-present				Investigated, no issues identified.	Groundwater Monitoring.
Former Tank Farm Areas (Q-8X Area)	GI-1	1999	2008		2009, 2010	2009-present				Phase 2 Delineation completed 2010.	Groundwater Monitoring.
Possible Old Burn Pit (G.I.T.#4)	GI-8	1999	2008	2008						Anecdotal report from site personnel. Not investigated.	
GIT 7	No APEC assigned	1999	2008	2008						No Phase 2 sampling completed to date.	

Norman Wells Area	Current APEC Number	Phase 1 ESA	Phase 1 ESA Update	Phase 2 ESA - Geophysics	Phase 2 ESA - Drilling, Test-Pitting, Grab Sampling	Groundwater Monitoring	Dismantling/ Demolition	Remediation	Surface Restoration	Current Status	Planned 2018 Activities
GIT 9	No APEC assigned	1999	2008	2008						No Phase 2 sampling completed to date.	
Historical Spill Sites (Q-10X Area)	GI-12	1999	2008		2009					Phase 2 delineation complete.	
Historical Spill Site near O-14X	GI-5	1999	2008		2009					Investigated, no issues identified.	
O-18X Pipeline Break	GI-6				2012, 2013	2012-present				Phase 2 delineation & remedial excavations complete.	Groundwater Monitoring.
Q-06X Pipeline Break	GI-7				2012, 2013					Flowline is active, preliminary surface restoration completed by Imperial	
N-25X Wellsite	No APEC assigned	1999	2008	2008	2009					Phase 2 delineation complete.	
Former Tank Farm SE of P-11X Wellsite	GI-4	1999	2008	2008	2009, 2010	2009-present				Further delineation required.	Groundwater Monitoring.
O-29X Wellsite	No APEC assigned				2017		2014			Well cut and capped in 2014, above-ground infrastructure was removed. Preliminary Phase 2 ESA completed in 2017.	Reclamation as required to meet CCME Parklands Standards.
T-08X Wellsite	No APEC assigned						2015			Well Cut and Capped in 2015, above-ground infrastructure removed. Preliminary Phase 2 completed.	
Town Leases											
A-45X	ME-37	1999	2008	pre-2008	2008, 2009, 2013	2013-2015	2009	2013-2015		Phase 2 and 3 delineation complete, well cut and cap in 2009, excavation and recontour complete 2010. Screening Level Risk Assessment complete. Additional Phase 2 delineation remediation of southwest corner complete in 2013. Additional test pitting and remedial excavation works completed in 2014 and 2015.	Monitoring well abandonment planned Preparation to close out lease and return property to productive use.
Lot 1000	No APEC assigned	1999	2008		2008			2010	2010	Phase 2 and 3 delineation complete, remedial excavation and recontouring completed in 2010.	
Cemetery	No APEC assigned	1999	2008		2008, 2013					Phase 2 in up-gradient area complete.	Continued groundwater monitoring in area upgradient of cemetery.
Other C&R Initiatives											
Landfill / Borrow Area / Biocell Siting					2009, 2010					Limited Phase 2 ESA completed in potential locations. Biocell constructed in Yard D in 2014.	
Metals Stabilization										Co-operative research on-going with Australian Antarctic Research Division, final report received in 2011.	
Soil Ecotoxicity										Research with SRC continued in 2010/11 & 2012. Soil samples collected for invertebrate identification. Plant and invertebrate ecotoxicity testing on-going following method development. Ccoperative research with Imperial, Queens University, Royal Military College and Advisian.	Continue development of plant and invertebrate ecotoxicity tests with Norman Wells soil.
Revegetation Trial Plots										Plots dismantled at T401 for soil remediation activities in 2011.	
Background Conditions in Soil/Groundwater					various years, 1997 to 2012, 2016	1997-present				Characterized new inferred background locations in 2010 and 2012 to supplement existing information, completed statistical analysis. Background boreholes completed on Mainland, Goose and Bear in 2015. Revised soil background assessment completed in 2016. Updated groundwater background assessment completed in 2017/2018.	Continue annual monitoring to build on existing background groundwater chemistry database.
Monitoring Well Abandonments					2009-2016					Damaged/surplus monitoring wells were abandoned or confirmed destroyed by ice.	
Thermistor Study					2013, 2016					Seven thermistors installed on Mainland. Thermistor installed at Bear Island Sumps.	Download data and report annually on temperature profile trends with depth.
Mackenzie River Scour Study										Field work completed in 2012.	
Former Production Well Abandonments					2012, 2013, 2014, 2015		2012, 2014, 2015			B-30X and B-35X cut and capped in 2012; O-29X, E-27X, E-33X and B-42X cut and capped in 2014. T-08X and C-27X cut and capped in 2015.	No well abandonments planned for 2018.