May 19, 2020

Manitoba Conservation and Climate
1007 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Edwin Yazon

Re: Supplemental Information Request File No. 6046.00: Redonda DGHTA Application

As a leader in environmental and energy services, Tervita Corporation (Tervita) has a strong track record of safety and environmental compliance. We have built our track record on the safe, secure management of industrial and oil and gas wastes through our network of Treatment and Recovery facilities and industrial landfills.

Tervita received questions regarding the Redonda Hazardous Waste and Hazardous Recyclable Processing and Storage Facility (the Facility), Dangerous Goods Handling and Transportation Act (DGHTA) application on May 1st from the Technical Advisory Committee (TAC). Below are the questions with responses:

1) Conditional use order

a) *Conditional use order No. 19-18 issued is to establish a "Hazardous waste transport facility". The proposal is for establishing a "Hazardous Waste and Hazardous Recyclable Processing and Storage Facility". Please ensure to a use permit that does not only transport HW, but also process and store HW. This is to prevent issue in the future regarding the intended use of the facility.*

Tervita will work with the Rural Municipality (RM) of Springfield to ensure the wording "Hazardous Waste and Hazardous Processing and Storage Facility" is used in the development agreement.

2) Exterior Storage

a) *Sea-cans – Set back distance from the boundary fence is required.*

The sea-cans will be set back approximately 2m from the fence-line.

b) *Is there containment within the sea-can storage or spill containment structures used?*

The sea-cans have a sealed metal base that are visually inspected on a monthly basis to ensure there are no integrity issues. All the hazardous waste is in Transportation of Dangerous (TDG) certified containers prior to storage in the sea-cans. Tervita will place secondary containment within or below the sea-can prior to storing hazardous waste.

c) *What are non-hazardous wastes: Provide a list with estimated quantity stored.*

Examples of non-hazardous wastes for 2018 from our former Winnipeg Transfer Station are provided in Table 1. Volumes and types of non-hazardous waste will vary year over depending on projects and economic conditions.

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Table 1: Examples of Non-Hazardous Waste Types

Waste Type	Physical State	Weight (kg/L)
Adhesives	Liquid	7153
Clean Oil	Liquid	402
Glycol Solutions	Liquid	14405
Grease	Liquid	48400
Latex Paint	Liquid	1978
Oil with PCBs <50ppm	Liquid	11000
Absorbents/Rags	Solid	65002
Aluminum Oxide	Solid	2900
Non-Regulated Chemicals	Solid	15908
Cement/Concrete	Solid	9277
Light bulbs	Solid	3807
Oily Debris	Solid	12142
Solids with PCBs <50ppm	Solid	600

d) *Heavy equipment: what are they and why are they used? [may not be a part of the licence but the emission (air/noise/liquid) from the operations may become an issue].*

Yellow iron is stored while waiting to be mobilized to active projects except for maintenance occurring in the shop or minor site maintenance requirements such as snow removal, site grading etc. Equipment working at site is a forklift and transport trucks coming to load supplies and unload waste. An equipment list is in Attachment 1.

e) *Truck parking area needs to be marked, e.g. no truck storage of HW allowed.*

Please see the parking marked on the site plan (Attachment 2).

f) *Why containment curbs are not required for exterior storage area?*

There is no permanent storage of waste outside except for what's in the sealed sea-cans. The area is used for loading and unloading prior to waste being brought inside the transfer station. As per our hazardous waste transportation license, we will only store waste on our trucks for a maximum of 48 hours.

g) *Details of surface water drainage plan (collection, testing and discharge protocol) needs to be provided.*

The surface water drainage plan is in Attachment 3. The only waste stored outside is the sealed sea-cans, therefore there is a low risk of spills and contact with surface water. All spills are cleaned up immediately. Therefore, at this time, storage and testing of surface water is not planned.

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3) Interior Storage

a) Interior floor plan with areas marked for HW storage, drum washing, shredding, crushing, sump pit, liquid collection tank, loading/unloading bay, etc. is required.

The interior floor plan with requested markup is in Attachment 4.

b) Process details for crushing /shredding of filters/absorbents are required.

Filters and absorbents can be shredded/crushed to separate solids from liquids. Material deemed suitable for crushing/shredding is sorted first to ensure non-conforming waste such as compressed gas cylinders are not put through the process. Recovered fluids are directed to a container where oil can be skimmed for recycling. Solids are bulked into a large container, where a representative sample is taken. Depending on economic conditions and customer preferences, solids can be sent to locations such as landfill, fuel for power options etc. Wastewater is sampled and sent to a suitable disposal option.

c) Estimated number of drums washed, and estimated quantity of filters/absorbents crushed or shredded.

The number of drums washed, and filters processed is dependent on the number of projects available to Tervita. Drums washed on an annual basis may vary from 100-1000 and filters processed could range from 10,000kg to 75,000kg.

d) Does the filters/absorbents crushing/ shredding process generate air emission? If yes, please provide mitigation measures.

When operational, the press would be tied into the electrical power grid and not have associated air emissions. The shredder would only be operated if projects became available for its use.

e) Will Tervita use the mechanical shop for a different purpose other than storing and servicing heavy equipment, e.g. to cater to outside clients?

At this time, Tervita only services our own yellow iron. If this change, Tervita will work with the RM of Springfield to ensure our business license, zoning etc. is accurately reflected by our operations.

f) Containerized processing involves consolidation and repacking of hazardous waste. Materials could include highly flammable and volatile types. Materials may also generate dust (asbestos impacted materials). Identify possible emission sources with methods of abatement.

Tervita will not be repacking asbestos waste unless packaging is damaged. It will remain in 6mm double wrapped poly if it's being consolidated. Bulking of flammable and volatile waste streams to make full containers is minimal at the facility and is primarily performed at the customers site. Flammable liquids are stored in tight-head drums

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therefore, when bulking is being performed there are only a 2" diameter and ¾" diameter bung open on the drum. This minimizes surface area and volatiles being able to escape. As soon as bulking is done, the bungs are sealed again to prevent volatile loss.

Tervita has deemed the following materials are not suitable for bulking:

- Chlorinated solvents
- Isocyanates
- Peroxide forming compounds
- High odour compounds (thiols, amines, mercaptans)

4) General

a) *Copies of Standard Operating Procedures (SOPs) identified in the proposal need to be provided.*

All SOP's can be provided to MCC during an inspection of the facility when operational.

b) *Non-conforming waste receipt: this needs to follow the Hazardous waste regulatory requirements - Section 20, Duty of consignee on discrepancy or refusal to accept waste and Section 24(1) Duties when consignee does not accept hazardous waste.*

When accepting movement documents, Tervita will ensure Part C is completed, which details whether the shipment was accepted or refused. If waste is refused, Tervita will provide the paperwork back to the carrier for delivery back to the consignor.

c) *A copy of the baseline environmental site assessment report (already available) needs to be submitted*

A copy of the report is in Attachment 5.

d) *Generator registration form do not reflect all types of waste generated/stored in the proposed development. The form needs to be revised and re-submitted.*

Tervita will update the generator registration form and resubmit it.

e) *A contingency or an emergency response plan, and the details of fire safety equipment needs to be provided.*

Tervita's Corporate ERP is in Attachment 6 and the Fire Safety Plan is in Attachment 7. Tervita is still working with the Fire Chief to finalize all the details in the Fire Plan. A finalized version can be provided once complete. The site-specific ERP will be finalized once the site is operational. The site-specific ERP will contain the following details:

- General worksite information
- Common Response Procedures
- Incident Assessment Procedures
- Emergency Classification
- Emergency Response Actions
- Incident Management Team
- Plot Plan
- Hazardous Substances
- Medical Facility Route

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- Emergency Contact Numbers
- Agency and Priority Contacts
- Industrial Operators Within Immediate Area
- Support Services (Safety Contractors etc.)
- Incident Command System

Sincerely,

Tervita Corporation

Peter Nelson
Advisor, Environment & Regulatory
pnelson@tervita.com

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Attachment 1
Equipment List

Equipment

Excavators 9

1 EX137 JD 200DLC
1 EX345 Cat 336EL
1 EX346 Cat 336EL
1 EX409 Kom 450LC-8
1 EX411 Cat 345DL
1 EX4-028-ES Kom 450LC

Dozers 3

1 CT244 Cat D6TXW w/Ripper (GPS)
1 CT6-252-ES Cat D6TSW
1 CT6-053-ES Cat D6T LGP (wide)

Rock Trucks 4

1 AT204 Cat 730
1 AT221 Vlv A30F
1 AT227 Cat 730
1 AT228 Cat 730

Loaders 2

1 LD130 Cat 803
1 LD124 Cat 966

Forklifts 3

1 FL146 Cat DP70
1 FL147 Doo D30S

Skid Steers 1

1 SS3-006-ES JD Skid Steer

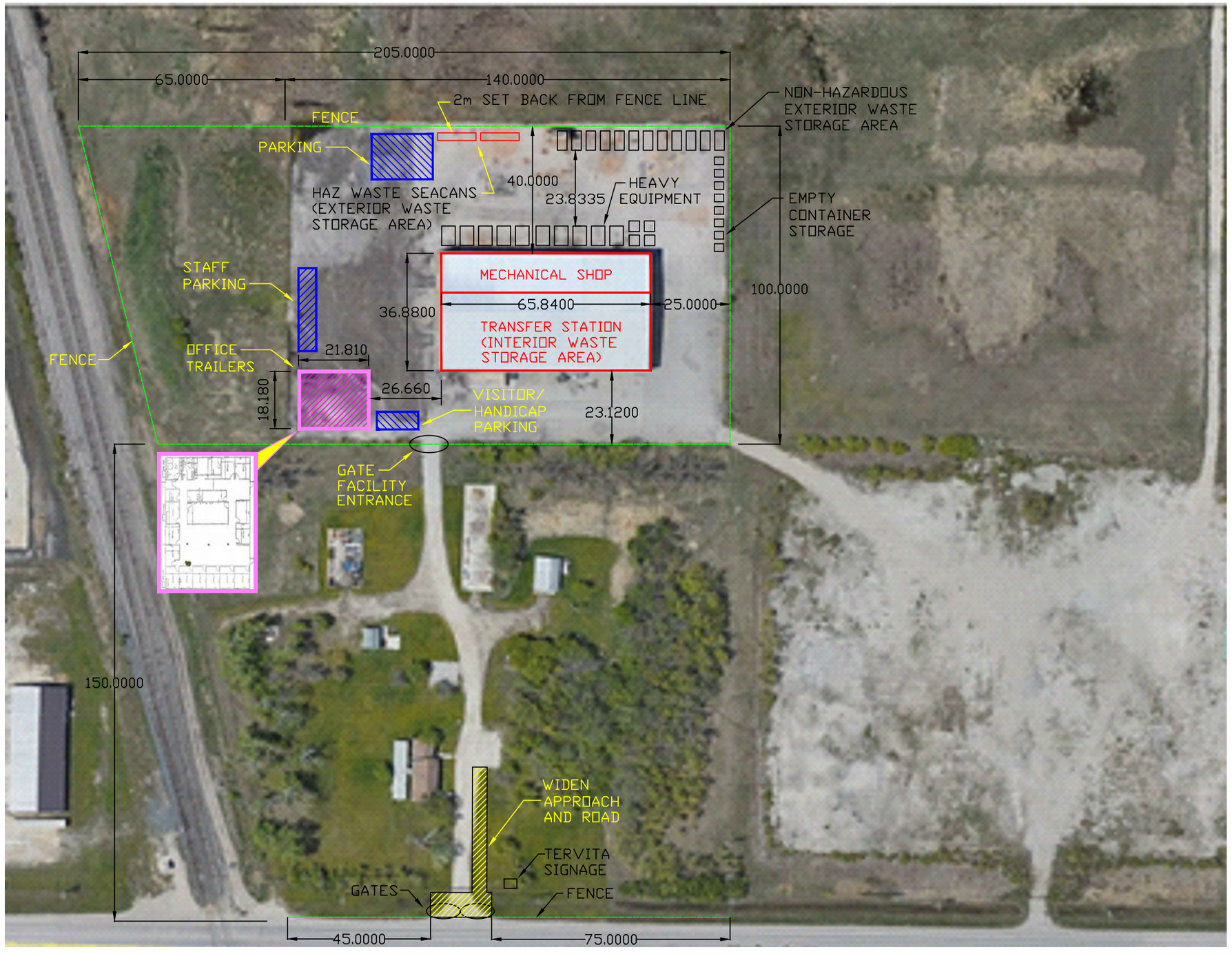
Light Plants / Trailers 7

TR253 (CLD 426)*
TR264 (CVL 932) Cargo no ins
TR272 (CVL 935) Cargo
TR278 (991 JRG - SK)
TR279 (CYL 318) Cargo
TR355 (CYL 327)* Maxim
TR356 (CLD 417) Cargo

Highway Units

Ford F550	Mechinc Truck
Kenworth T800	highway tractor
Peterbilt 378	highway tractor
Kenworth T370	roll off
Kenworth T800	roll off
Peterbilt 365	roll off
Freight M2 112	roll off
GMC 5500	small dump truck
Int'l Workstar 7500	cube van
Hino 268	cube van
Freight M2 112	picker truck

Attachment 2
Plot Plan



CERTIFICATE OF TITLE:
2005569/1 W.L.T.O.
(SEARCH DATE: NOV. 14, 2019)

LEGAL DESCRIPTION:
LOT 1, PLAN 29953 WLTO
IN E.1/2 16-11-4 E.P.M.

CIVIC ADDRESS:
999 REDONDA STREET
R.M. OF SPRINGFIELD
MANITOBA

20 10 0 20
METRES

REV	DATE	REVISION DESCRIPTION	PROJ/AFE#	BY	CHK'D	APP'D
A	2020/05/12	ISSUED FOR APPLICATION	-	TL	NM	

REDONDA

LEGAL PROPERTY ADDRESS	E. 1/2 16-11-04 E.P.M.

SPRINGFIELD MANITOBA

REDONDA FACILITY
SITE PLAN

SCALE:	DWG. No.	REV.
1:500	TER-RDA-SK-002	A

U:\Redonda Site_plan Rev_A (003).dwg, TLJ 14, 2020 4:36:33pm, thomas

Attachment 3
Site Drainage Plan

BARNES 1906 &DUNCAN
SURVEYING, ENGINEERING & GEOMATICS

999 Redonda Existing Commercial
STORM WATER RUNOFF ANALYSIS

Date:	March 9, 2020	**Project:**	999 Redonda Street
By:	Brett Carels, P.Eng.	**Project Number:**	19-1234

This drainage brief has been prepared on behalf of Wood Group PLC for the existing commercial site located at 999 Redonda Street in the Rural Municipality (RM) of Springfield. This brief has been prepared to support the grading plan for the developed area of the site, in order to be reviewed and approved by the client (Tervita), the RM and Manitoba Conservation and Climate (MCC). The total area of the site is approximately 31.2 Ha (312,022m^2) and the majority of the land is old farm field with the south east portion being the most developed. The 46,120m^2 developed part of the site in the SE corner is the primary area of interest for this analysis.

As the site is already developed the primary reason for this brief is to document how the site will decrease its current runoff while capturing and controlling more of the developed site than is currently draining to the Redonda Street ditch network. The RM of Springfield does not have a previous drainage plan on record for this site and required that one be prepared. As the site is already developed and no new structures are being proposed, the RM of Springfield did not stipulate that storm runoff needed to be captured, controlled and if required temporarily stored onsite, however the project has done this in order for the site to comply with the RM of Springfield's requirements for new commercial sites, to comply with MCC and Manitoba Infrastructure (MI) requirements to control the runoff from a 25yr post development event to that of a 5yr pre-development.

Figure 1. Google Maps Aerial View

Existing Site

The site currently has a large commercial/industrial building surrounded by an asphalt apron. There is a centre gravel drive aisle connecting the various buildings and sheds on the property. There is an existing swale north of the asphalt apron and to the south of the developed portion of the site is a gravel drive aisle that offers as a support/access road for the adjacent rail line. The asphalt apron next to the larger shop is about the same elevation as the centre of Redonda Street. The area of the site that currently drains to the fronting Redonda Street ditch network is about **22,909m^2** (1750m^2 of building, 1965m^2 of asphalt/conc, 976m^2 of gravel, 7481m^2 heavily treed, 10737m^2 of grass).

Runoff Analysis

Stormwater management designed as follows: All Pre-Development Rational Formula runoff calculations are to be based on a 5 year storm event, with "t" (time) = 20 minutes and "i" (intensity) – 81.25 mm/hr. The total allowable runoff from the site during a 25-year storm event will be restricted to the 5-year storm event.

C values for buildings, concrete, or asphalt paving are 0.90m, gravel areas are 0.50, heavily treed areas are 0.20, and landscaping or grassed areas are 0.10.

Pre-Development Allowable Flow:

$$Q_5=kCiA$$

Where,
C = Weighted runoff coefficient i = peak rainfall intensity (mm/hr) A = catchment area (m^2)
Q_5 = 1 in 5-year runoff (L/s) k = conversion constant = 1/3600

$$Q_5=k^* 0.28^* 81.25\text{mm/hr}^* 22{,}909\text{m}^2$$

Allowable Q_5 = 144.8 L/s

Post Development:
The site design includes extending and widening the north swale further west to capture and control more of the asphalt apron, constructing a new swale on the south of the site and installing control culverts prior to either swale discharging to the Redonda Street ditch network. There will still be some portion of the west asphalt apron that will continue to drain into the site's farm field to the west. The field is at or below the existing Redonda Street ditch and has a natural gradient to continue west away from the buildings. The total post development area flowing to the Redonda Street ditch network is **27,323m^2** (or an additional 4,414m^2). The 25yr controlled flow and storage volumes were modelled and calculated in Autodesk Storm and Sanitary Analysis (SSA) using the SCS TR-20 hydrologic method and a 25yr generated storm. The volume calculation was checked using the SSA software and the Isochrone Method.

Controlled Runoff:
The 25yr controlled runoff from the development flowing out of the 275mm culvert end cap on the north swale will be controlled to 83.0 L/s with a 25yr High Water Level (HWL) of 235.09 at the control culvert. The 25yr controlled runoff from the development flowing out of the 275mm culvert end cap on the south

swale will be controlled to 44.8 L/s with a 25yr HWL of 235.53 at the control culvert. The storage required to account for the flow reduction was determined to be 385m^3 (Figure 6). The primary storage node for the site is a 245m long swale on the north, 45m of which has an oversized 5m bottom. The site also has a 130m long swale with a 1m bottom on the south side of the site.

The peak 25yr flow to the Redonda Street ditch is 139.2 L/s (Figure 5).

Figure 2 to Figure 7 are summaries from the model.

Subbasins

	Subbasin ID	Area	Wt. CN	TOC	Rain Gage ID
1	Sub-07	4540.2700	74.00	20.00	*
2	Sub-06	8466.5800	72.00	20.00	*
3	Sub-05	8626.4900	90.00	15.00	*
4	Sub-04	1529.7700	91.00	10.00	*
5	DirectRunoff	4160.3900	72.00	15.00	*

Close
Help

Figure 2. Sub-basin areas, weighted curve number and time of concentration used in the model for each sub-basin.

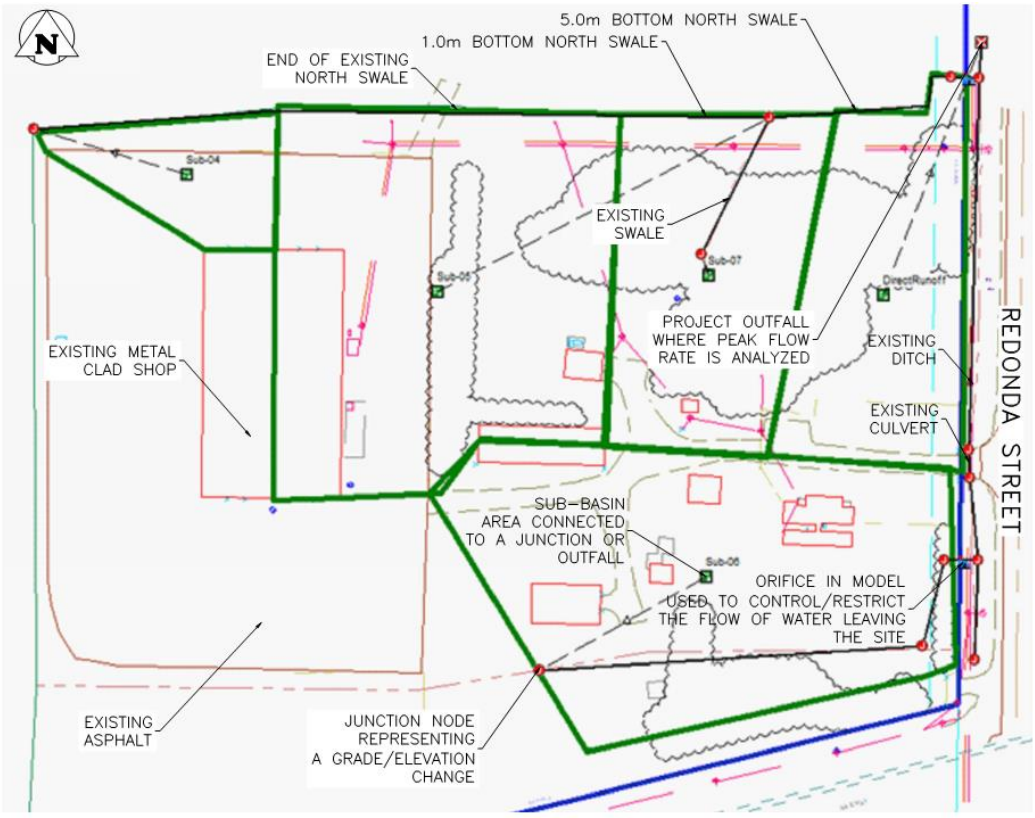


Figure 3. Sketch of the SSA model showing sub-basins, junctions, swales, orifice and outfall.

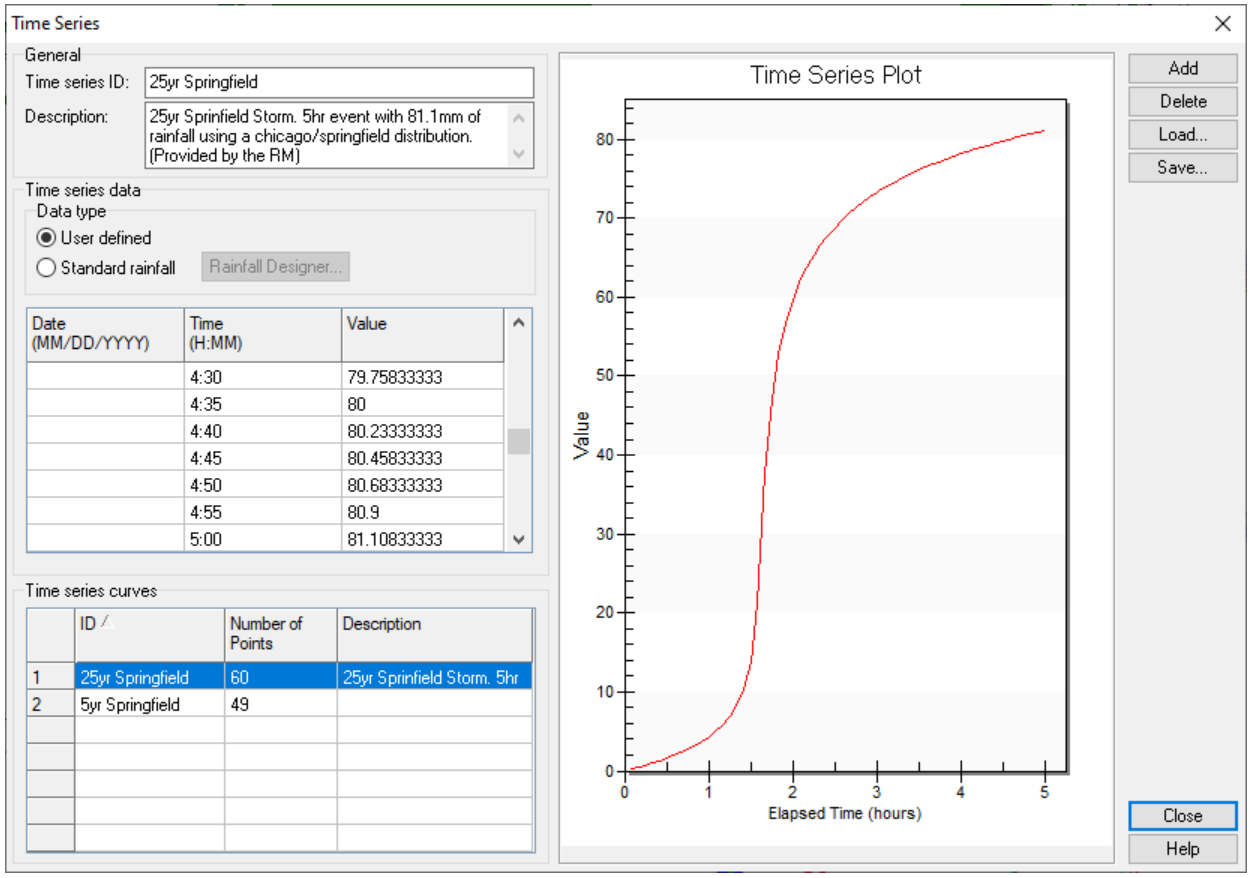


Figure 4. Rainfall 25 year time series event in the model.

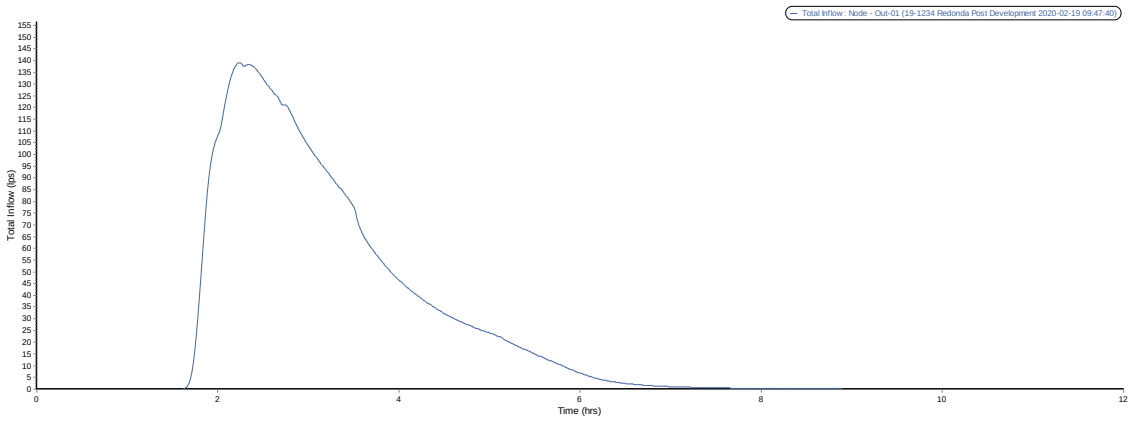


Figure 5. Peak outflow from the model's outlet (Peak 139.2 L/s).

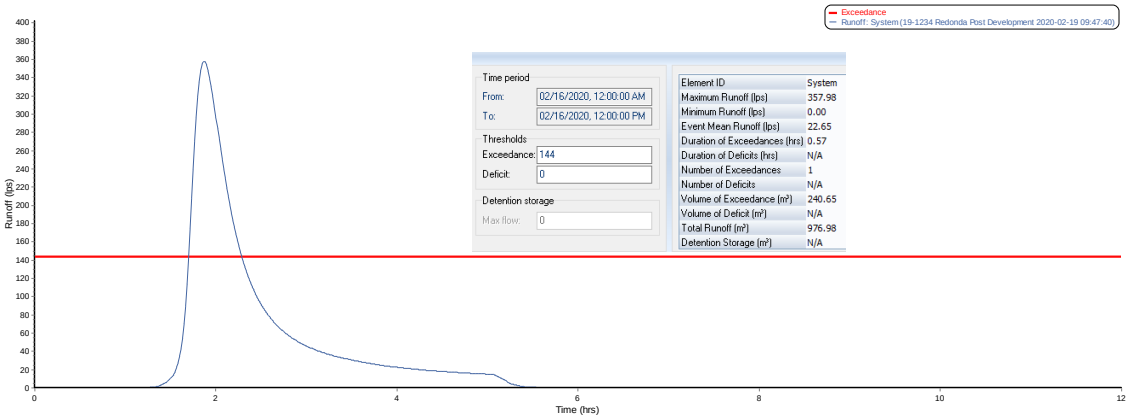


Figure 6. Peak 25yr runoff from the site if it was not controlled (358 L/s) and the estimate storage from the model to control the runoff to a peak of 144 L/s.

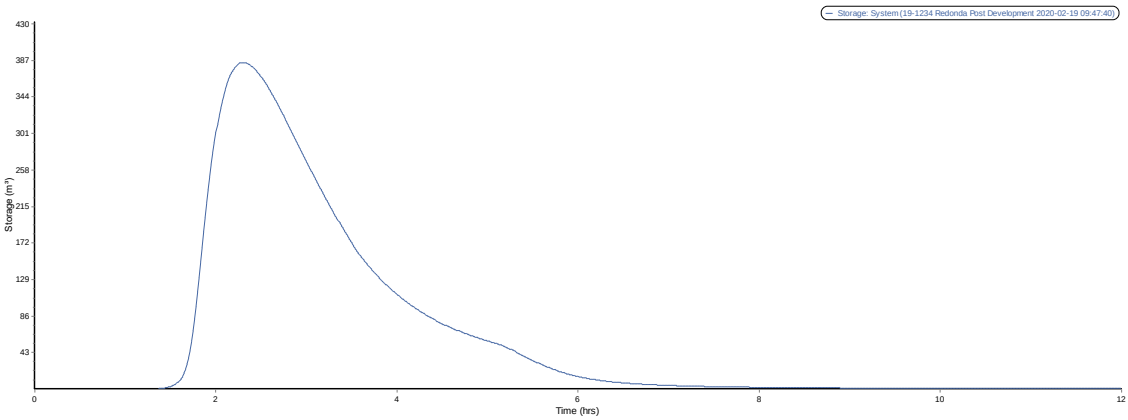


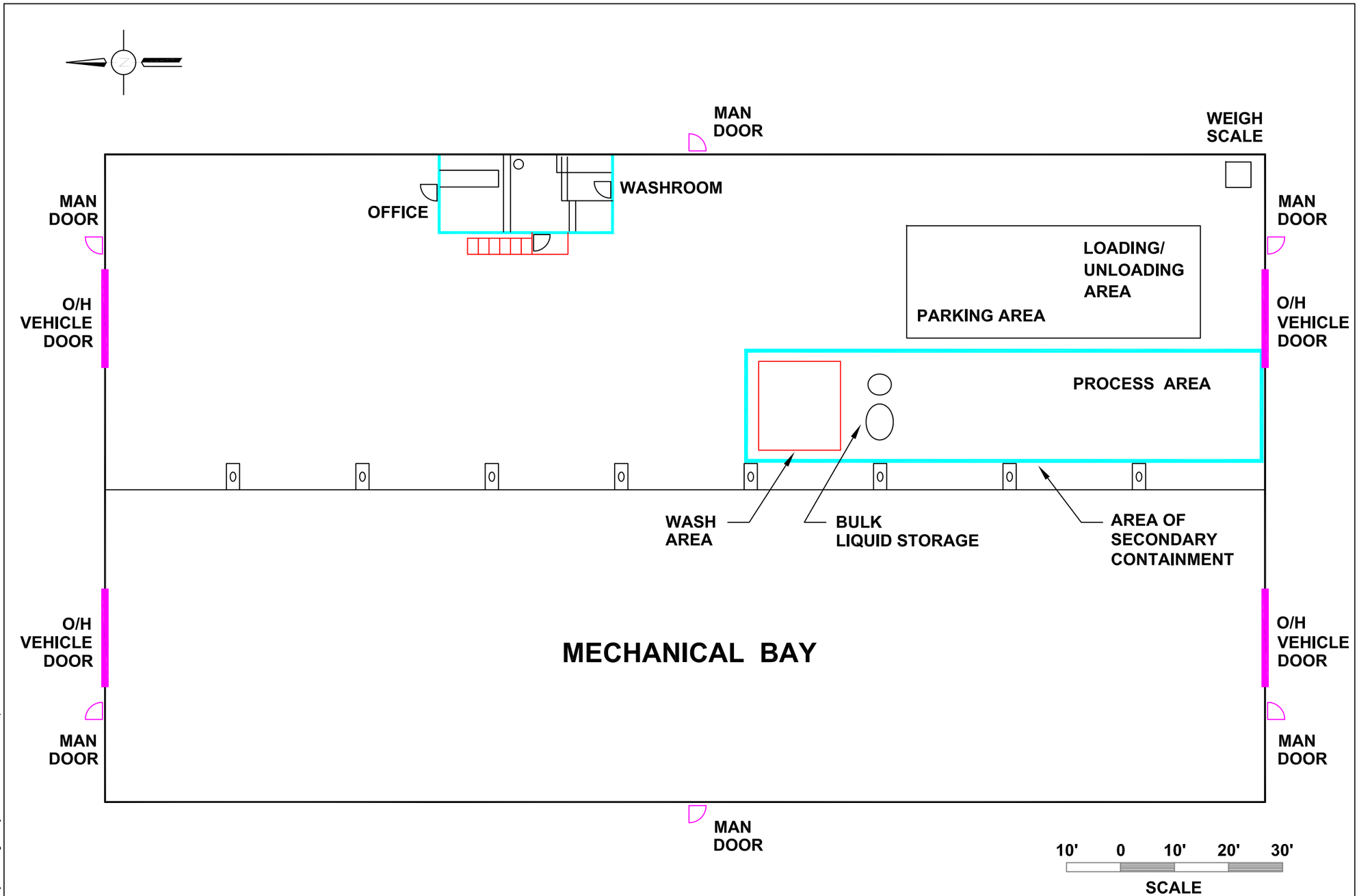
Figure 7. Peak volume stored onsite during the analysis (385m^3).

Summary

Based on this analysis it can be concluded that the proposed site drainage will comply with the RM and MCC requirements where the post development 25yr peak release rate of 139.2 L/s will be controlled to less than the existing 5yr peak rate of 144.8 L/s. The design has restricted the flow leaving the site by having two 275mm orifice restricting end caps on the inlets of the 450mm culverts flowing to Redonda Street and the associated storage required to assist the restriction of the flow is in the onsite swales. It has been determined the site is able to manage its stormwater requirements without the need for an onsite pond or similar water feature. This brief and the associated Drainage Plan prepared by Barnes & Duncan demonstrate how the site complies will all provincial and RM drainage requirements including condition 6 of the Conditional Use Order No. 19-18 issued by the RM.

Brett Carels, P. Eng. Municipal Engineer
Barnes & Duncan
204-284-5999
brett@barnesduncan.com

Attachment 4
Shop Layout



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REV	DATE	REVISION DESCRIPTION	PROJ/AFE#	BY	CHK'D	APP'D
A	2020/05/13	ISSUED FOR APPLICATION	–	TL	NM	

TERVITA

REDONDA

LEGAL PROPERTY ADDRESS: E. 1/2 16–11–04 E.P.M.

SPRINGFIELD MANITOBA
REDONDA FACILITY
SHOP BUILDING
FLOOR LAYOUT

SCALE: 1:500

DWG. No. TER–RDA–SK–003

REV. A

Attachment 5
Environmental Assessment

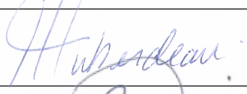
Phase II Environmental Site Assessment

999 Redonda Street, Rural Municipality of Springfield
Oakbank, Manitoba

15 May 2020

Environment & Infrastructure Solutions
440 Dovercourt Drive, Winnipeg Manitoba, Canada R3Y 1N4
Phone: (204) 488-2997
www.woodplc.com

Phase II Environmental Site Assessment
999 Redonda Street, Rural Municipality of Springfield
Wood Project Number – WX18979

Prepared for:	Tervita Corporation 1600, 160 10th Avenue SE Calgary, AB		
Contact:			
Report Distribution:			
Red River Co-operative Limited:	Electronic Copy		
Wood:	Electronic Copy		
	Name	**Job Title**	**Signature**
Prepared by:	Angie Cerilli, M.Sc.	Environmental Technician	
Reviewed by:	Justin Huberdeau C.E.T.	Senior Environmental Technologist	
Project Manager:	Kevin Beechinor, B.Sc.	Senior Environmental Scientist	
Other Technical Contributors			

Rev.	**Date**	**Revision Notes**
	15 May 2020	**FINAL**

Executive Summary

Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited (Wood), conducted a Phase II Environmental Site Assessment (ESA) at 999 Redonda Street as part of the development of a new hazardous waste collection and storage facility in Oakbank, Manitoba (Site).

The purpose of the Phase II ESA was to assess areas of potential environmental concern (APECs) identified during a Phase I ESA completed at the Site by Wood in December 2019, as well as to collect soil and groundwater quality information in order to provide an assessment of the baseline conditions at the Site prior to Tervita operations.

APECs previously identified at the Site are related to historical fires which have occurred at the Site (APEC 1) as well as the presence of a 1,900 L fuel aboveground storage tank (AST) (APEC 2).

To address the APECs and provide further baseline assessment of the Site, 11 test holes were advanced at the Site (TH19-01 through TH19-11). As well, six groundwater monitoring wells were installed in order to characterize shallow soil and groundwater at the Site (i.e., depths up to 4.5 m below grade level).

Selected soil samples were submitted for laboratory analysis for petroleum hydrocarbon (PHC) fractions F1 to F4, Polychlorinated Biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals and extractable organic halides (EOX). Six groundwater samples were collected from the newly installed monitoring wells and submitted for laboratory analysis of PHC fractions F1 to F4, PAHs, VOCs, total organic halides (TOX), and metals. In addition, one sample, considered representative of the water supply well at the Site was submitted for the same groundwater chemical analysis additionally including dioxins and furans.

Soil and groundwater sample analysis indicate the concentrations of potential contaminants of concern were below the applicable guideline criteria for all soil and groundwater samples. Soil and groundwater concentrations do indicate some spatial trends in concentrations of PHCs, PAHs and EOX/TOX. Soil and groundwater samples collected near to the areas where historical fires occurred, or where run-off would accumulate (around the edges of the concrete apron surrounding the warehouse), indicate relatively higher concentrations in comparison to background (TH19-01). Concentrations of analytical parameters in the groundwater sample collected from the water well were relatively lower in comparison to shallow groundwater, or less than detection limits, indicating residual impact from historical fires is low and shallow and not in the deeper bedrock aquifer.

Based on the results of the Phase II ESA completed at the Site, there is no evidence to suggest that the Site has been negatively impacted by the historical fire events that took place on-Site to a degree that would represent a potential risk to human health and the environment. The Site is considered to be suitable for continued industrial use.

Based on the results of the current assessment, no further investigation at the Site is warranted at this time. However, if impacts are identified during the scheduled redevelopment of the Site, additional investigation may be required at that time.

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Glossary of Commonly Used Abbreviations

AEP	Alberta Environment and Parks
APEC	Areas of potential concern
CCME	Canadian Council of Ministers of the Environment
cm/s	centimetres per second
CSRA	Contaminated Sites Remediation Act
CSRR	Contaminated Sites Remediation Regulation
EDL	Estimated Detection Limit
EOX	Total Extractable Organic Halides
ESA	Environmental Site Assessment
m bgl	metres below ground level
NAPL	non-aqueous phase liquid
NCSCS	National Classification System for Contaminated Sites
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PHC	petroleum hydrocarbon
ppm_v	parts per million organic vapour
QA/QC	quality assurance/quality control
RPD	relative percent difference
TOX	Total Organic Halides
VOC	Volatile Organic Compounds

1.0 Introduction

Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited (Wood), conducted a Phase II Environmental Site Assessment (ESA) at 999 Redonda Street as part of the development of a new hazardous waste collection and storage facility in Oakbank, Manitoba (Site). The purpose of the Phase II ESA was to assess the areas of potential environmental concern (APECs) identified during a Phase I ESA completed at the Site by Wood on 20 December 2019. As well, to collect soil and groundwater quality information in order to provide an assessment of the baseline conditions at the Site prior to Tervita operations.

1.1 Background

1.2 Site Location and Surrounding Land Use

The Site is located in the Rural Municipality of Springfield (RM of Springfield), Manitoba, in an industrial subdivision located near the eastern limits of the City of Winnipeg. A map showing the location of the Site in relation to the surrounding area is shown in Figure 1. A plan showing the layout of the Site and the neighbouring properties is provided in Figure 2.

According to the RM of Springfield, the Site and surrounding area is zones as "MG", defined as Industrial General Zoning.

The Site currently consists of a residential dwelling with a modular office trailer attached to the south exterior wall, a warehouse building surrounded by a large concrete pad, a metal clad garage and a wooden storage shed. Two concrete slabs were also observed in the central portion of the Site.

The Site is industrial land use and will likely remain so for the foreseeable future. Surrounding land use consisted of commercial land use adjacent to the northeast and vacant land to the northwest, commercial land use to the east, a rail line followed by commercial land use to the south side, and vacant undeveloped grassland adjacent to the west side.

Land use is summarized in Table 1 and shown on Figure 1. The layout of the Site is shown on Figure 2. Photos of the Site and surrounding areas taken during the 2019 investigation are presented in Appendix A.

1.3 Previous Investigations

A Phase I ESA was conducted by Wood at the Site, the results of which were presented in the report entitled "*Phase I Environmental Site Assessment, 999 Redonda Street, Oakbank, Manitoba, WX18979*" dated 20 December 2019. As a part of the Phase I ESA, previous historical environmental information was reviewed for the Site, in addition conducting a Site visit, in order to observe the current conditions at the Site. The APECs identified in the report are discussed below.

- **APEC 1 –** Several fires have occurred at the Site. Based on information reviewed, the fires potentially involved the burning of plastic, metals or other products and wastes stored on Site. Run-off from water used during fire suppression could potentially impact soil and groundwater at the Site by migrating combustion byproducts, chemicals and wastes from the fire to soil and groundwater locations at low areas, and at the edges of the concreate aprons and slabs at the Site. Specifically, the area south and south west of the existing concrete pad surrounding the warehouse, as historical storage of plastics along the south and west portions of the concrete pad may have been consumed during a 2006 fire. Based on aerial photographs runoff from water used to suppress the fire may have flowed off the pad and into the adjacent vegetated area. Additionally, runoff from water used to suppress the fires which damaged/destroyed the buildings east of the warehouse could potentially impact soil and groundwater near these buildings by migrating combustion byproducts, chemicals and wastes from the fire to soil and groundwater. As such the potential for impacts to soil and groundwater in these areas of the Site cannot be discounted.
- **APEC 2 -** An approximate 1,900 L, steel, single walled diesel fuel AST was observed outside adjacent to the north exterior wall of the garage. The tank was situated on a concrete pad; however, no secondary containment was present. Based on the presence of the tank, the single walled construction and the lack of secondary containment potential for impacts to the Site cannot be discounted.

2.0 Scope of Work

Wood submitted a proposed scope of work with the original proposal for the project (WPG2019.621) detailing an assumed scope of work for assessing the Site based on the project objectives. The scope of work for the Phase II ESA was revised based on the results of the Phase I ESA conducted initially at the Site by Wood in order to assess APECs identified in the 2019 Wood Phase I ESA as well based on discussions with Tervita. The environmental scope of work proposed by Wood included the following general tasks:

- Advance 11 test holes at the Site, six of which were to be completed as monitoring wells.
- Complete logging, field screening and soil sampling during test hole advancement.
- Submit selected soil samples for analytical laboratory analysis for petroleum hydrocarbon (PHC) fractions F1 to F4, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals and total extractable organic halides (EOX).
- Conduct groundwater monitoring and sampling of newly installed monitoring wells as well as one on-Site water well.
- Submit groundwater samples for laboratory analysis of PHC fractions F1 to F4, PAHs, VOCs, metals total organic halides (TOX), and dioxins and furans.
- Prepare a report summarizing results of the assessment.

3.0 Investigative Methodology

3.1 Hazard Assessment and Service Locations

Prior to the start of the intrusive investigations, Wood completed a site-specific health and safety plan to identify hazards, project health and safety requirements, work site classification, and personal protective equipment requirements.

As part of standard ground disturbance procedures prior to commencing drilling, the locations of buried and overhead services were identified. The Manitoba Click Before You Dig program was contacted, which notified BellMTS, Manitoba Hydro, and Shaw Cable. Additionally, Wood contacted the RM of Springfield and a private locator to identify and mark respective underground utility locations.

3.2 Test Hole Drilling and Soil Sampling

The Phase II ESA drilling program was initiated on 3 December 2019, and continued on the 16 and 20 December 2019. The drilling program consisted of advancing 11 test holes (TH19-01 through TH19-11) using a track mounted drill rig operated by Maple Leaf Drilling Ltd. Six test holes were completed as groundwater monitoring wells. Test hole and monitoring well locations are shown on Figure 2.

During test hole advancement, soil samples were recovered at regular 0.8 m depth intervals, or more frequently when evidence of impacts or change in stratigraphy was noted. Soil samples were classified according to the Modified Unified Soil Classification system and visually assessed for evidence of impact.

The soil samples were split into two portions: one portion was placed in disposable soil bags (for field screening) and the other portion was placed in laboratory-prepared 40 mL vials (pre-charged with methanol) and 120 mL glass jars (for possible laboratory analyses).

Soil samples were field screened for combustible organic vapours using ambient temperature headspace (ATH) techniques and an RKI™ Eagle combustible vapour analyzer set in the no methane response mode. The ATH method involved partially filling and sealing disposable soil bag with soil and allowing vapours to accumulate prior to analyzing the headspace. Accumulated vapours were measured in parts per million total organic vapours (ppm_v).

Soil samples were stored in an insulated cooler that contained ice packs while on-Site and during transport to the laboratory. Field protocols and quality assurance/quality control (QA/QC) procedures utilized by Wood were in accordance with industry standard protocols.

The location and elevation of all newly installed and existing monitoring wells were collected using a survey grade GPS system consisting of a Trimble TSC3 controller and R8 receiver. Northings and eastings, as well as top of casing and ground level elevations, were measured and recorded for all points. In addition to the monitoring well/test hole locations, the corners of buildings and other permanent structures and any identified utility locations were surveyed in, where possible.

3.3 Groundwater Monitoring and Sampling

Six test holes (TH19-01, TH19-03, TH19-04, TH19-07, TH19-08, and TH19-10) were completed as groundwater monitoring wells in order to measure subsurface vapour levels, establish groundwater conditions at the Site, and to allow for groundwater sampling. Monitoring wells were completed with a section of 0.010" slot screened interval with a solid PVC riser extending from the well screen to the ground surface. The borehole annulus around the screened interval was filled with 10/20 filter sand to a depth of approximately 0.15 m above the top of screen. Above the sand pack, the borehole annulus around the solid PVC casing was sealed with hydrated bentonite chips to ground's surface. Each of the monitoring wells installed was completed with a protective casing at surface and in general accordance with provincial regulations for environmental monitoring wells. The monitoring well construction details are shown on the applicable test hole logs (Appendix B).

The initial visit to the Site for groundwater monitoring and sampling was conducted on 20 December 2019. However, due to low water levels, and slow groundwater accumulation within monitoring well TH19-01 a second visit was conducted on 08 January 2020. Groundwater monitoring and sampling included the following:

- Inspection of groundwater monitoring well conditions;
- Measurement of groundwater monitoring well vapour concentrations;
- Determination of the presence and thickness of NAPL;
- Determination of groundwater levels; and
- Collection of groundwater samples.

Monitoring well vapour concentrations were measured with an RKI Eagle set in the no methane response mode and groundwater levels were measured with an electronic interface probe.

One water sample was collected from a faucet inside the warehouse building in order to characterize the groundwater quality from the water well. During sample collection, the water faucet was run for approximately 5 min, in order to collect a sample representative of well water. It is understood that the water from the faucet was from the water well located 3 m south of the warehouse building and did not undergo water treatment.

The collected groundwater samples were placed in clean certified bottles provided by the laboratory, stored in an insulated cooler with ice while on Site and during transport to the laboratory. The field protocols and QA/QC procedures utilized by Wood during Site monitoring were in accordance with standard industry protocols.

3.4 Laboratory Analysis

Potential contaminants of concern associated with the Site were related to the APECs identified in the Wood December 2019 Phase I ESA conducted at the Site, as well as the project objective of characterizing baseline conditions at the Site, prior to Tervita's planned operations. Samples were submitted for laboratory analysis to ALS Environmental in Winnipeg, Manitoba which is accredited by the Canadian Association Laboratory Accreditation Inc. (CALA) for testing in accordance with the International Standard ISO/IEC 17025.

Soil samples were submitted for chemical analysis for PHC fractions F1 to F4, metals and PAHs from each

of the 11 test hole locations. Soil samples from select test holes were also submitted for chemical analysis of VOCs (nine samples), PCBs (eight samples), and EOX (eight samples). Soil samples were selected based on location in relation to identified APECs, depth, and observations. Additionally, one soil sample was also submitted for grain size analysis.

Groundwater samples from each of the six monitoring wells were submitted for PHCs, VOCs, PAHs metals and TOX.

In addition, one water sample was collected from the on-Site water well located 5 m south of the warehouse building. The water sample was designated "Tap" and submitted for PHCs, VOCs, PAHs metals TOX and dioxins and furans

4.0 Site Setting

4.1 Regional Conditions

4.1.1 Regional Geology

Based on available geological maps, the subsurface stratigraphy in this area of the RM of Springfield normally consists of topsoil and fill materials underlain by glacio-lacustrine silt and clay to a depth of approximately 12 to 15 m from grade. The silt and clay deposits are low in hydraulic conductivity (in the order of 10^{-8} cm/s), with some secondary fracturing (Render 1970). A deposit of silty till, typically a few metres or more in thickness, occurs between the clay and the underlying bedrock. The bedrock in this area consists of dolomitic limestone with abundant chert nodules in the upper limestone layer and is of the Selkirk Member (Baracos et al., 1983). Bedrock is estimated to occur between 12 and 18 m below grade.

Fractured zones in the bedrock comprise the major aquifer in the area (Betcher et al. 1995). The overlying low conductivity silt and clay deposits do not support a useable source of groundwater, and as such are not utilized. In addition, the thickness and low conductivity deposits limit vertical migration and recharge to the underlaying aquifers (Render 1970).

4.1.1.1 Domestic Groundwater Use

The Site and surrounding properties are part of the RM of Springfield and are not connected to the City of Winnipeg's water distribution system. The RM does not provide a municipal water service to this area. Two water wells were observed on-Site. A total of 13 water well records were identified on Site in MCC's GW Drill (2018) water well database. Of the records, five were classified as test wells and abandoned, five were well records for recharge wells, two well records for 12-inch supply wells, and one domestic well record. The water well records for the Site were either identified as "X-Potential" or as 999 Redonda. All wells were completed to approximately 15 m depth. Water well records for the Site are provided in Appendix C.

Water well records for wells identified within the same quarter section as the Site (NE16-11-4E1) and the surrounding quarter sections within 500 m of the Site (NW15-11-4E1, SW15-11-4E1, SE16-11-4E1) were reviewed. From this, the majority of the records indicated domestic use and in general all records indicate wells installed into the bedrock aquifer.

4.2 Site Characterization

4.2.1 Topography

The western portion of the Site includes a large warehouse building surrounded by a concrete pad, with the eastern portion comprised of several buildings and sheds. A topographic survey was conducted at the Site as a part of the project which indicated that the highest elevations at the Site are near the former building foundations in the central portion of the Site and the lowest Site elevations wat the western edge of the Site. Elevations indicate, surface water run-off flows outward away from the large warehouse in the western portion of the Site. The eastern portion of the Site is includes a central gravel access road. Topography north of the road generally gently slopes to the north and east, and areas to the south, gently slope to the south and west. There is an existing swale in the northern portion of the Site that drains to the east. A topographic plan for the Site is included in Appendix D.

4.2.2 Stratigraphy

Stratigraphy at the test hole locations generally consisted of the following soil strata, in descending order:

- Organic matter;
- Gravel Fill;
- Clay;
- Silt (TH19-01, TH19-02 and TH19-06); and
- Clay.

A brief description of each of the soil strata is presented in the following paragraphs:

Organic Matter

Organic matter was encountered below the grass surface at six test holes (TH19-01, TH19-02, TH19-03, TH19-05, TH19-06 and TH19-09) and was approximately 9 cm in thickness.

Gravel Fill

Gravel fill was encountered at the ground surface of five test holes located around the perimeter of the concrete slab (TH19-04, TH19-07, TH19-08, TH19-10) and within the footprint of the warehouse building (TH19-11) and was approximately 75 cm in thickness.

Clay

Clay was encountered at all test hole locations and extended to the maximum explored depth of 4.6 meters below grade level (bgl). The clay was generally, medium or high plastic, medium to firm, damp, black/brown in colour and contained trace sand and trace mica.

Silt

Silt was encountered within the clay layer at test holes TH19-01 and TH19-02 and below the organic matter layer at TH19-06. The silt layer was 0.3 m, 0.5 m and 0.8 m thick, respectively. The silt was generally low plastic, damp to moist, soft and tan in colour. Plastic and organic debris was observed within the silt layer at TH19-06.

The subsurface soil stratigraphy encountered at each test hole location completed in 2019 is summarized in detail on the test hole logs in Appendix B.

4.2.3 Grain Size Designation

Grain size analysis was completed on soil sample collected from TH19-01 at 0.8 m bgl as part of the current assessment. The following grain size result was reported:

- TH19-01 – 0.8 m bgl (clay) – 2 %>75 µm – Fine

Based on the results of the grain size analysis, native soils at the Site are predominantly fine-grained in nature. In general medium to high plastic clay was observed below the surface soil layer and extended to the maximum depth explored at each test hole. Based on the above, the Site is characterized as fine-grained for the purpose of this assessment.

5.0 Assessment Criteria

5.1 Applicable Guidelines

MCC has adopted the principles established by the CCME for environmental management and assessment of sites in Manitoba, in addition to the requirements of the Manitoba Contaminated Sites Remediation Act (CSRA) and the Manitoba Contaminated Sites Remediation Regulation (CSRR), M.R. 105/97. The ESA process in Manitoba is outlined in the MCC June 2016 Guideline document "Environmental Site Assessments in Manitoba" which discusses the derivation process to determine the applicable Assessment Guidelines and Reporting Standards for potentially contaminated soil, groundwater, surface water or sediment.

The Assessment Guidelines for the Site are used to determine the significance of risk to human health and the environment associated with the contamination discovered by an ESA and what future action is recommended to address the risk for the site. The Assessment Guidelines can be derived primarily from the Environmental Quality Guidelines (EQGs) published by CCME; however, should the CCME not provide adequate information or guidance, documents from other jurisdictions such as Ontario Ministry of Environment (MOE) and Alberta Environment and Parks (AEP) may be used, provided they are supported as the most scientifically valid Assessment Guidelines for the Site. The following documents produced by CCME were selected as being applicable for assessment of the Site dependent on the contaminants of concern, pathways and receptors:

- CCME 1999 (updates to 2019). Canadian Environmental Quality Guidelines (EQGs).
- CCME 2001 (revised 2008). Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil.
- Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ 2019).

Based on the conditions present at the Site, the following documents may be used for groundwater assessment:

- Government of Alberta, Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines January 2019 (AEP 2019).
- Ontario Ministry of the Environment. (MOE, 2011). Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act.

The document and exposure pathway selection and determination of assessment criteria for the Site is described in detail in Appendix E.

5.2 Soil and Groundwater

In consideration of the current and inferred future industrial land use of the Site, the fine-grained nature of the soil and the applicable exposure pathways (as outlined in Appendix E), assessment guidelines for each contaminant of concern in surface soil, subsoil, and groundwater were selected.

Based on the Site setting and above considerations, the limiting exposure pathways that are the most stringent for management of the Site impacts are:

- vapour inhalation (slab-on-grade);
- ecological contact;
- off-site migration check;
- management limits.

The groundwater sample taken from the indoor water supply tap located in the on-Site shop will be compared to GCDWQ 2019.

The limiting exposure pathways and associated applicable exposure pathways are presented in Appendix E and Table E-1.

6.0 Assessment Results

6.1 Soil Conditions

6.1.1 Field Observations

The vapour concentrations encountered during the drilling program were less than the instruments detectable limit (<5 ppm_v) in all of the soil samples collected.

Soil vapour concentrations measured and field observations made during the drilling program are summarized in Table 2 and detailed on the test hole logs (Appendix B).

6.1.2 Soil Laboratory Results

Following the drilling program, a total of 12 soil samples were submitted to ALS Canada Ltd. (ALS) laboratory in Winnipeg, Manitoba. All soil samples were submitted for analysis of BTEX and PHC fractions F1 to F4; 11 samples were submitted for metals and PAHs analysis; nine samples were submitted for VOCs analysis, eight samples were submitted for PCBs analysis; four samples were submitted for EOX analysis; and one samples was submitted for grain size designation. There were no exceedances over the applicable criteria in the samples submitted for analysis.

Soil laboratory results for parameters of PHCs, metals, PAHs, VOCs, PCBs and EOX are presented in Table 3 through Table 8 and on Figure 3 through Figure 7 and Figure 13 (EOX). Copies of the detailed analytical reports are provided in Appendix F.

6.2 Groundwater Conditions

6.2.1 Groundwater Monitoirng

During the monitoring event, the water level at monitoring well TH19-01 was deemed insufficient for sampling, as such, a return visit for sampling TH19-01 was scheduled and conducted on 08 January 2020. During this Site visit, a water sample from the indoor water supply tap in the warehouse building located on Site was also collected. Results of the Site monitoring program are summarized in Table 9. Monitoring well construction details are shown on the test hole logs (Appendix B).

The depth to groundwater measured at the Site during the current assessment ranged from 1.84 m bgl (TH19-03) to 4.52 m bgl (TH19-02).

Groundwater elevations suggest that shallow groundwater elevations follow site topography with flow generally to the south, southwest. However, given the low conductivity soils, it is possible that groundwater levels within the monitoring wells had not stabilized at the time of measurement.

6.2.1.1 Well Headspace Vapour Concentrations

The in-well headspace vapour concentration was less than the equipment's detectable limit at all monitoring well locations (<5 ppm_v).

6.2.1.2 Non-Aqueous Phase Liquids

NAPL was not detected in any of the monitoring wells during the 2019 monitoring event.

6.2.2 Groundwater Laboratory Results

6.2.2.1 Groundwater Laboratory Results

A total of eight groundwater samples were submitted for laboratory analysis, including one sample from each of the six groundwater monitoring wells installed at the Site, as well as one blind field duplicate sample and one groundwater sample collected from the warehouse building, representative of the water well.

Samples were submitted for analysis of PHC fractions F1 to F4, VOCs, PAHs, metals, TOX, dioxins and furans. The results of all analysis indicated that the constituent concentrations were below the applicable guidelines for the assessment of the Site. Groundwater laboratory results for parameters of PHCs, metals, PAHs, VOCs, TOX and dioxins and furans are presented in Tables 10 through Table 15. Results are also summarized on Figures 9 through Figure 13 (TOX). Copies of the detailed analytical reports are provided in Appendix F.

Exceedances of aesthetic objectives for drinking water were noted for iron and manganese in the water sample collected from the tap in the warehouse. These iron and manganese concentrations in shallow groundwater are likely indicative of background conditions. Iron and manganese are aesthetic parameters, which relates to the palatability of potable water and the cause of staining on plumbing fixtures and laundry and, as indicated by Health Canada, it is not considered a risk to human health (Health Canada 2017).

6.3 Quality Assurance/Quality Control

6.3.1 Laboratory Accreditation

The Canadian Association Laboratory Accreditation Inc. (CALA) has accredited ALS Environmental in Winnipeg, MB for testing in accordance with the International Standard ISO/IEC 17025:2017.

6.3.2 Data Validation

6.3.2.1 Laboratory QA/QC

The laboratory incorporates various QA/QC procedures to ensure the accuracy of the laboratory results and assess the possibility of false positives attributable to analytical equipment contributions and laboratory control samples. The laboratory QA/QC includes the completion of laboratory blanks, blank

spikes and blank spike recovery. A summary of QA/QC findings is presented in the attached laboratory results.

6.3.2.2 Field QA/QC

One duplicate groundwater sample set was submitted as part of the field program. Relative percent difference (RPD) was calculated for parameters containing detectable concentrations at least five times the laboratory detection limit. The relative percent difference (RPD) approach can be used as a means of assessing the accuracy of the duplicate analytical results. The RPD is calculated for specific parameters using the following equation:

$$Field\ Duplicate\ RPD\ (\%) = \frac{|C_1 - C_2|}{(C_1 + C_2)/2} \times 100$$

where: RPD = relative percent difference
C1= first of two observed values from the field duplicate analysis
C2 = second of two observed values from the field duplicate analysis

RPD values can be calculated for parameters that contain detectable concentrations at least five times greater than the laboratory method detection limit.

One duplicate soil sample set and one duplicate groundwater sample set were submitted as part of the field program. Due to low concentrations the RPDs could not be calculated for the soil blind field duplicate.

One duplicate groundwater sample (TH19-03/DUP1) was collected and submitted for analysis. Based on the low concentrations the RPD could not be calculated for the sample. RPDs were calculated for metals which ranged from 15% to 200%. The wide range in concentrations is likely due to sediment entrainment during sample collection.

6.3.2.3 Data Validation Summary

Based on the laboratory analysis, sample collection, sample storage, sample bottles and transportation of the samples to the laboratory, there was no material effect on the quality of the data collected as part of this assessment. The laboratory results for soil and groundwater samples obtained during Wood's investigation are considered to be valid.

7.0 Discussion

The purpose of the Phase II ESA was to further assess the two APECs identified during the Phase I ESA, as well as establish baseline conditions at the Site prior to Tervita's operation at the Site.

7.1 APEC 1 - Historical Fires

Several fires have historically occurred at the Site, generally located on the concrete apron surrounding the warehouse building, but also near former storage areas in the southern portion of the Site. Seven test holes were advanced in the areas where the fires occurred and in downgradient areas where run-off water may have accumulated. TH19-03 was located near a former storage Quonset where a fire occurred, as well as TH19-04 through TH19-09 were drilled in areas near the large concrete apron surrounding the current warehouse building. Soil samples from these test holes indicated generally low-level detections of PAHs in soil samples from test holes TH19-04, TH19-05 and TH19-06 and EOX at TH19-06. However, all concentrations were below applicable assessment criteria. Otherwise no discernable pattern in soil chemical concentrations were noted related to APEC 1.

Chemical analytical results from the groundwater samples collected at the Site indicate that groundwater concentrations are below the applicable groundwater quality guidelines for the Site. Based on the exposure pathways identified for groundwater, no risks to human or environmental health have been identified.

Based on a review of the relative soil groundwater concentrations of potential contaminants of concern, concentrations were noted to be generally higher in the southeast areas of the Site in the areas surrounding the warehouse and associated concrete pads. TH19-01 was positioned in a generally upgradient area of the Site in order to provide a location potentially representative of background conditions. The highest concentrations of PAHs were noted at TH19-04. This test hole and monitoring well was located at the south edge of the large concrete apron, where run-off may accumulate. These elevated concentrations may be indicative of the presence of impacts related to historical fires, however, are not at a concentration that would be considered a concern for future industrial use.

The water well, located 5 m south of the warehouse, is located in the central portion of the apron where the historical fires have occurred. Groundwater samples collected from the water well had concentrations of analytical parameters that were generally less that samples collected from other monitoring wells at the Site. Specifically concentrations of PAHs, and groundwater dioxins and furans were low or less than detection limits, indicating residual impact from historical fires is low and shallow and not in the bedrock aquifer.

The parameters for total extractable organic halides (EOX) for soil and total organic halides (TOX) for groundwater are parameters for describing the total organic halogen compounds present in soil or groundwater. The parameter can be used to screen samples for the presence of a range of substances, including volatile compounds, and persistent organic pollutants, some of which are produced during combustion. Soil and groundwater analysis for these compounds was conducted on samples collected from test holes and monitoring wells near the area of the edge of the apron where the fire occurred as well as a background sample and water well sample. The results indicated the highest (and only detectable) concentrations in soil were at TH19-07, located southwest of the apron. The highest concentration in groundwater was reported at TH19-10, located on the north side of the apron. Detectable concentrations were also reported for groundwater three other locations near the south edge

of the apron (TH19-03, TH19-04, and TH19-07). Concentrations at TH19-01, and the water well were less than detection limits, further supporting the conclusion that residual impact from historical operations and fires is low and shallow and not impacting the bedrock aquifer. TOX as well as dioxins and furans results are presented on Figure 13.

7.2 APEC 2 – On-Site AST

An on-Site AST was observed near the metal clad garage building. One test hole (TH19-02) was advanced in the vicinity of the AST in order to assess soil conditions related to potential petroleum hydrocarbon impacts from the fuel storage. Soil sample results indicate that concentrations of PHC constituents were below detection limits. These results indicate that impacts related to the use of the AST are either not present or limited in extent and do not pose a signification risk for continued use of the Site.

7.3 Baseline Conditions

As noted above, TH19-01 was positioned in a generally upgradient area of the Site in order to provide a location potentially representative of background conditions. With some exceptions, soil and groundwater concentrations of the chemical constituents analyzed were generally lower in this area of the Site. As noted above, the higher concentrations of PHCs, PAHs, and EOX and TOX were noted in the soil and groundwater samples collected from the area south of the warehouse and concrete apron. These concentrations are not considered a human or environmental risk, and do not exceed applicable environmental quality criteria. These concentrations should be utilized for comparison to future soil and groundwater monitoring data collected at the Site in order to determine if changes related to Tervita's operations are occurring at the Site.

8.0 Conclusions and Recommendations

The purpose of the Phase II ESA was to further assess APECs identified at the Site and to collect baseline soil and groundwater data prior to Tervita operations at the Site. Soil and groundwater concentrations do indicate some spatial trends in concentrations of PHCs, PAHs, and EOX/TOX. Soil and groundwater samples collected near to the areas where historical fires occurred, or where run-off would accumulate, indicate relatively higher concentrations in comparison to background (TH19-01). Concentrations of analytical parameters in the groundwater sample collected from the water well were low or less than detection limits, indicating residual impact from historical fires is low and shallow and not in the deeper bedrock aquifer.

Based on the results of the Phase II ESA completed at the Site, there is no evidence to suggest that the Site has been negatively impacted by the historical fire events that took place on-Site to a degree that would represent a potential risk to human health and the environment. The Site is considered to be suitable for continued industrial use.

Based on the results of the current assessment, no further investigation at the Site is warranted at this time. However, if impacts are identified during the scheduled redevelopment of the Site, additional investigation may be required at that time.

As exceedances of the applicable Reporting Standards were not identified, the report is not required to be submitted to MCC for review.

9.0 Project Limitations

The American Society for Testing and Materials Standard of Practice notes that no environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in the connection with a property. Performance of a standardized environmental site assessment protocol is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the property, given reasonable limits of time and costs. The findings of this investigation are based on the interpretation of a limited number of analytical results pertaining to specific samples. The evaluation and interpretations do not preclude the existence of chemical substances other than those identified herein, or the possibility that contamination levels can vary between the areas of the investigation.

This report is based on, and limited by, the interpretation of data, circumstances, and conditions available at the time of completion of the work as referenced throughout the report. It has been prepared in accordance with generally accepted engineering practices.

10.0 Closure

We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact Wood.

Further general limitations are provided in Appendix G.

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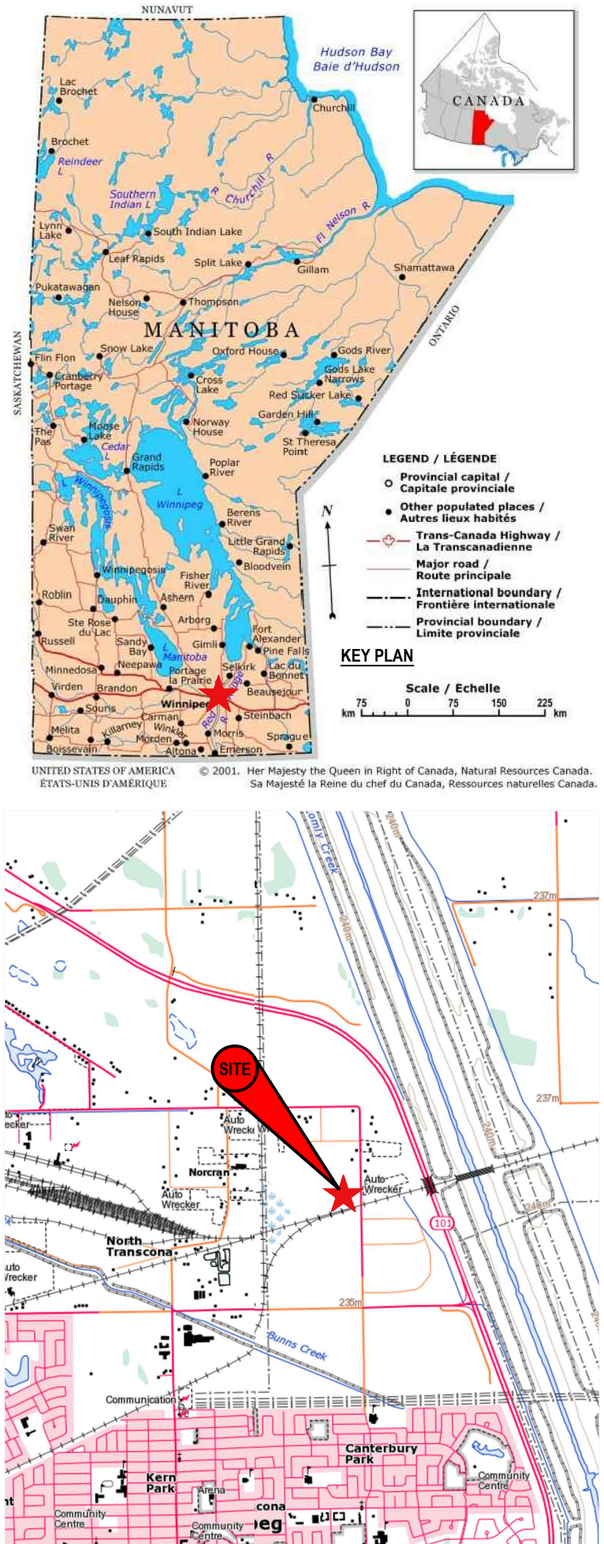
Figures



wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
APPROXIMATE PROPERTY LINE

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY AND TOPO MAP.

NO.	REVISION	DATE	BY

PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

SITE AND SURROUNDING LAND USE PLAN

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 1

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

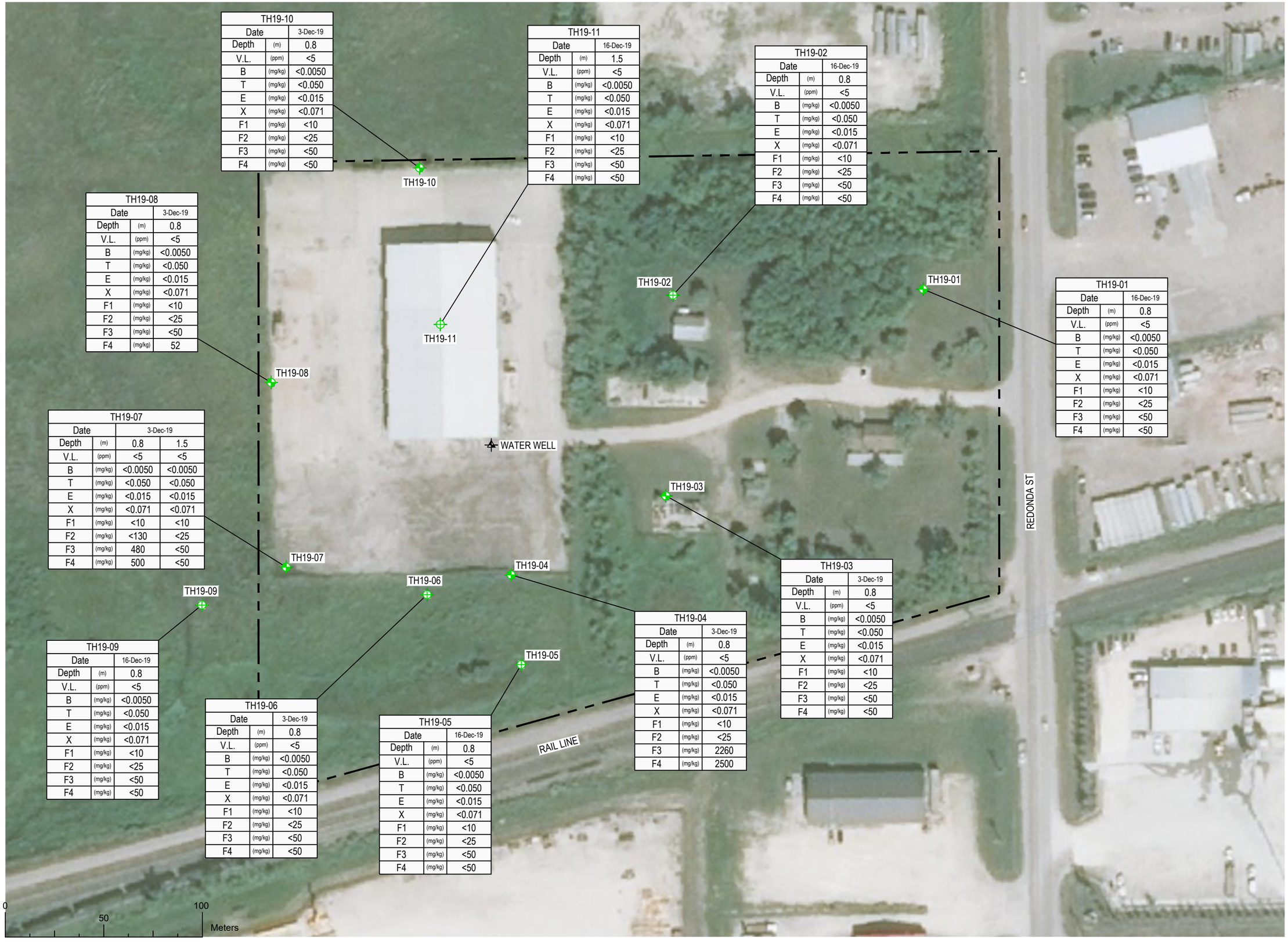
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

TEST HOLE AND MONITORING WELL LOCATION PLAN

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 2



TH19-10		
Date		3-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-11		
Date		16-Dec-19
Depth	(m)	1.5
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-02		
Date		16-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-01		
Date		16-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-08		
Date		3-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	52

TH19-07			
Date		3-Dec-19	
Depth	(m)	0.8	1.5
V.L.	(ppm)	<5	<5
B	(mg/kg)	<0.0050	<0.0050
T	(mg/kg)	<0.050	<0.050
E	(mg/kg)	<0.015	<0.015
X	(mg/kg)	<0.071	<0.071
F1	(mg/kg)	<10	<10
F2	(mg/kg)	<130	<25
F3	(mg/kg)	480	<50
F4	(mg/kg)	500	<50

TH19-09		
Date		16-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-06		
Date		3-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-05		
Date		16-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

TH19-04		
Date		3-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	2260
F4	(mg/kg)	2500

TH19-03		
Date		3-Dec-19
Depth	(m)	0.8
V.L.	(ppm)	<5
B	(mg/kg)	<0.0050
T	(mg/kg)	<0.050
E	(mg/kg)	<0.015
X	(mg/kg)	<0.071
F1	(mg/kg)	<10
F2	(mg/kg)	<25
F3	(mg/kg)	<50
F4	(mg/kg)	<50

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WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

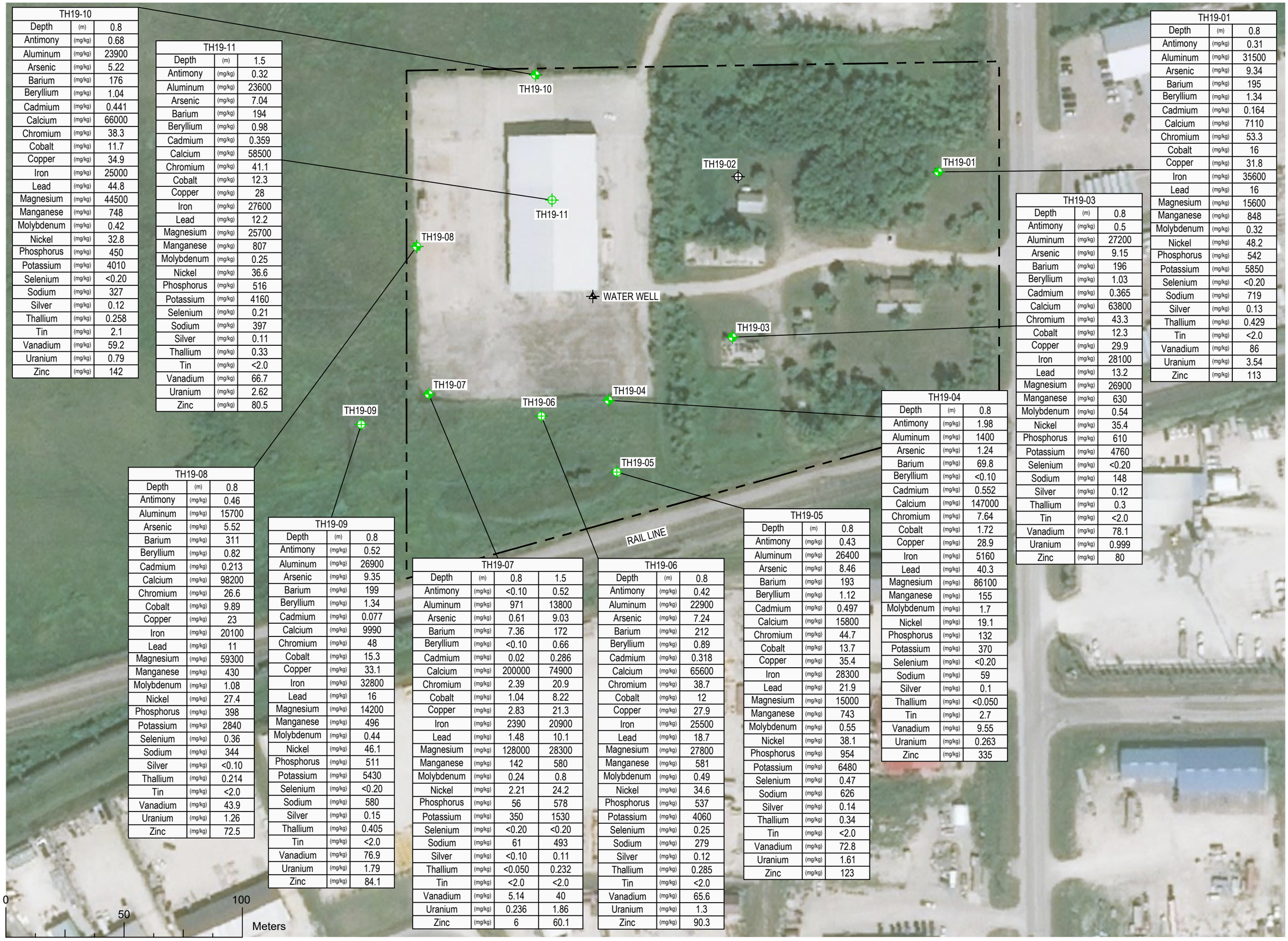
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

SOIL ANALYTICAL RESULTS - PHCs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 3



TH19-10		
Depth	(m)	0.8
Antimony	(mg/kg)	0.68
Aluminum	(mg/kg)	23900
Arsenic	(mg/kg)	5.22
Barium	(mg/kg)	176
Beryllium	(mg/kg)	1.04
Cadmium	(mg/kg)	0.441
Calcium	(mg/kg)	66000
Chromium	(mg/kg)	38.3
Cobalt	(mg/kg)	11.7
Copper	(mg/kg)	34.9
Iron	(mg/kg)	25000
Lead	(mg/kg)	44.8
Magnesium	(mg/kg)	44500
Manganese	(mg/kg)	748
Molybdenum	(mg/kg)	0.42
Nickel	(mg/kg)	32.8
Phosphorus	(mg/kg)	450
Potassium	(mg/kg)	4010
Selenium	(mg/kg)	<0.20
Sodium	(mg/kg)	327
Silver	(mg/kg)	0.12
Thallium	(mg/kg)	0.258
Tin	(mg/kg)	2.1
Vanadium	(mg/kg)	59.2
Uranium	(mg/kg)	0.79
Zinc	(mg/kg)	142

TH19-11		
Depth	(m)	1.5
Antimony	(mg/kg)	0.32
Aluminum	(mg/kg)	23600
Arsenic	(mg/kg)	7.04
Barium	(mg/kg)	194
Beryllium	(mg/kg)	0.98
Cadmium	(mg/kg)	0.359
Calcium	(mg/kg)	58500
Chromium	(mg/kg)	41.1
Cobalt	(mg/kg)	12.3
Copper	(mg/kg)	28
Iron	(mg/kg)	27600
Lead	(mg/kg)	12.2
Magnesium	(mg/kg)	25700
Manganese	(mg/kg)	807
Molybdenum	(mg/kg)	0.25
Nickel	(mg/kg)	36.6
Phosphorus	(mg/kg)	516
Potassium	(mg/kg)	4160
Selenium	(mg/kg)	0.21
Sodium	(mg/kg)	397
Silver	(mg/kg)	0.11
Thallium	(mg/kg)	0.33
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	66.7
Uranium	(mg/kg)	2.62
Zinc	(mg/kg)	80.5

TH19-01		
Depth	(m)	0.8
Antimony	(mg/kg)	0.31
Aluminum	(mg/kg)	31500
Arsenic	(mg/kg)	9.34
Barium	(mg/kg)	195
Beryllium	(mg/kg)	1.34
Cadmium	(mg/kg)	0.164
Calcium	(mg/kg)	7110
Chromium	(mg/kg)	53.3
Cobalt	(mg/kg)	16
Copper	(mg/kg)	31.8
Iron	(mg/kg)	35600
Lead	(mg/kg)	16
Magnesium	(mg/kg)	15600
Manganese	(mg/kg)	848
Molybdenum	(mg/kg)	0.32
Nickel	(mg/kg)	48.2
Phosphorus	(mg/kg)	542
Potassium	(mg/kg)	5850
Selenium	(mg/kg)	<0.20
Sodium	(mg/kg)	719
Silver	(mg/kg)	0.13
Thallium	(mg/kg)	0.429
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	86
Uranium	(mg/kg)	3.54
Zinc	(mg/kg)	113

TH19-03		
Depth	(m)	0.8
Antimony	(mg/kg)	0.5
Aluminum	(mg/kg)	27200
Arsenic	(mg/kg)	9.15
Barium	(mg/kg)	196
Beryllium	(mg/kg)	1.03
Cadmium	(mg/kg)	0.365
Calcium	(mg/kg)	63800
Chromium	(mg/kg)	43.3
Cobalt	(mg/kg)	12.3
Copper	(mg/kg)	29.9
Iron	(mg/kg)	28100
Lead	(mg/kg)	13.2
Magnesium	(mg/kg)	26900
Manganese	(mg/kg)	630
Molybdenum	(mg/kg)	0.54
Nickel	(mg/kg)	35.4
Phosphorus	(mg/kg)	610
Potassium	(mg/kg)	4760
Selenium	(mg/kg)	<0.20
Sodium	(mg/kg)	148
Silver	(mg/kg)	0.12
Thallium	(mg/kg)	0.3
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	78.1
Uranium	(mg/kg)	0.999
Zinc	(mg/kg)	80

TH19-04		
Depth	(m)	0.8
Antimony	(mg/kg)	1.98
Aluminum	(mg/kg)	1400
Arsenic	(mg/kg)	1.24
Barium	(mg/kg)	69.8
Beryllium	(mg/kg)	<0.10
Cadmium	(mg/kg)	0.552
Calcium	(mg/kg)	147000
Chromium	(mg/kg)	7.64
Cobalt	(mg/kg)	1.72
Copper	(mg/kg)	28.9
Iron	(mg/kg)	5160
Lead	(mg/kg)	40.3
Magnesium	(mg/kg)	86100
Manganese	(mg/kg)	155
Molybdenum	(mg/kg)	1.7
Nickel	(mg/kg)	19.1
Phosphorus	(mg/kg)	132
Potassium	(mg/kg)	370
Selenium	(mg/kg)	<0.20
Sodium	(mg/kg)	59
Silver	(mg/kg)	0.1
Thallium	(mg/kg)	<0.050
Tin	(mg/kg)	2.7
Vanadium	(mg/kg)	9.55
Uranium	(mg/kg)	0.263
Zinc	(mg/kg)	335

TH19-08		
Depth	(m)	0.8
Antimony	(mg/kg)	0.46
Aluminum	(mg/kg)	15700
Arsenic	(mg/kg)	5.52
Barium	(mg/kg)	311
Beryllium	(mg/kg)	0.82
Cadmium	(mg/kg)	0.213
Calcium	(mg/kg)	98200
Chromium	(mg/kg)	26.6
Cobalt	(mg/kg)	9.89
Copper	(mg/kg)	23
Iron	(mg/kg)	20100
Lead	(mg/kg)	11
Magnesium	(mg/kg)	59300
Manganese	(mg/kg)	430
Molybdenum	(mg/kg)	1.08
Nickel	(mg/kg)	27.4
Phosphorus	(mg/kg)	398
Potassium	(mg/kg)	2840
Selenium	(mg/kg)	0.36
Sodium	(mg/kg)	344
Silver	(mg/kg)	<0.10
Thallium	(mg/kg)	0.214
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	43.9
Uranium	(mg/kg)	1.26
Zinc	(mg/kg)	72.5

TH19-09		
Depth	(m)	0.8
Antimony	(mg/kg)	0.52
Aluminum	(mg/kg)	26900
Arsenic	(mg/kg)	9.35
Barium	(mg/kg)	199
Beryllium	(mg/kg)	1.34
Cadmium	(mg/kg)	0.077
Calcium	(mg/kg)	9990
Chromium	(mg/kg)	48
Cobalt	(mg/kg)	15.3
Copper	(mg/kg)	33.1
Iron	(mg/kg)	32800
Lead	(mg/kg)	16
Magnesium	(mg/kg)	14200
Manganese	(mg/kg)	496
Molybdenum	(mg/kg)	0.44
Nickel	(mg/kg)	46.1
Phosphorus	(mg/kg)	511
Potassium	(mg/kg)	5430
Selenium	(mg/kg)	<0.20
Sodium	(mg/kg)	580
Silver	(mg/kg)	0.15
Thallium	(mg/kg)	0.405
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	76.9
Uranium	(mg/kg)	1.79
Zinc	(mg/kg)	84.1

TH19-07			
Depth	(m)	0.8	1.5
Antimony	(mg/kg)	<0.10	0.52
Aluminum	(mg/kg)	971	13800
Arsenic	(mg/kg)	0.61	9.03
Barium	(mg/kg)	7.36	172
Beryllium	(mg/kg)	<0.10	0.66
Cadmium	(mg/kg)	0.02	0.286
Calcium	(mg/kg)	200000	74900
Chromium	(mg/kg)	2.39	20.9
Cobalt	(mg/kg)	1.04	8.22
Copper	(mg/kg)	2.83	21.3
Iron	(mg/kg)	2390	20900
Lead	(mg/kg)	1.48	10.1
Magnesium	(mg/kg)	128000	28300
Manganese	(mg/kg)	142	580
Molybdenum	(mg/kg)	0.24	0.8
Nickel	(mg/kg)	2.21	24.2
Phosphorus	(mg/kg)	56	578
Potassium	(mg/kg)	350	1530
Selenium	(mg/kg)	<0.20	<0.20
Sodium	(mg/kg)	61	493
Silver	(mg/kg)	<0.10	0.11
Thallium	(mg/kg)	<0.050	0.232
Tin	(mg/kg)	<2.0	<2.0
Vanadium	(mg/kg)	5.14	40
Uranium	(mg/kg)	0.236	1.86
Zinc	(mg/kg)	6	60.1

TH19-06		
Depth	(m)	0.8
Antimony	(mg/kg)	0.42
Aluminum	(mg/kg)	22900
Arsenic	(mg/kg)	7.24
Barium	(mg/kg)	212
Beryllium	(mg/kg)	0.89
Cadmium	(mg/kg)	0.318
Calcium	(mg/kg)	65600
Chromium	(mg/kg)	38.7
Cobalt	(mg/kg)	12
Copper	(mg/kg)	27.9
Iron	(mg/kg)	25500
Lead	(mg/kg)	18.7
Magnesium	(mg/kg)	27800
Manganese	(mg/kg)	581
Molybdenum	(mg/kg)	0.49
Nickel	(mg/kg)	34.6
Phosphorus	(mg/kg)	537
Potassium	(mg/kg)	4060
Selenium	(mg/kg)	0.25
Sodium	(mg/kg)	279
Silver	(mg/kg)	0.12
Thallium	(mg/kg)	0.285
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	65.6
Uranium	(mg/kg)	1.3
Zinc	(mg/kg)	90.3

TH19-05		
Depth	(m)	0.8
Antimony	(mg/kg)	0.43
Aluminum	(mg/kg)	26400
Arsenic	(mg/kg)	8.46
Barium	(mg/kg)	193
Beryllium	(mg/kg)	1.12
Cadmium	(mg/kg)	0.497
Calcium	(mg/kg)	15800
Chromium	(mg/kg)	44.7
Cobalt	(mg/kg)	13.7
Copper	(mg/kg)	35.4
Iron	(mg/kg)	28300
Lead	(mg/kg)	21.9
Magnesium	(mg/kg)	15000
Manganese	(mg/kg)	743
Molybdenum	(mg/kg)	0.55
Nickel	(mg/kg)	38.1
Phosphorus	(mg/kg)	954
Potassium	(mg/kg)	6480
Selenium	(mg/kg)	0.47
Sodium	(mg/kg)	626
Silver	(mg/kg)	0.14
Thallium	(mg/kg)	0.34
Tin	(mg/kg)	<2.0
Vanadium	(mg/kg)	72.8
Uranium	(mg/kg)	1.61
Zinc	(mg/kg)	123

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
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TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

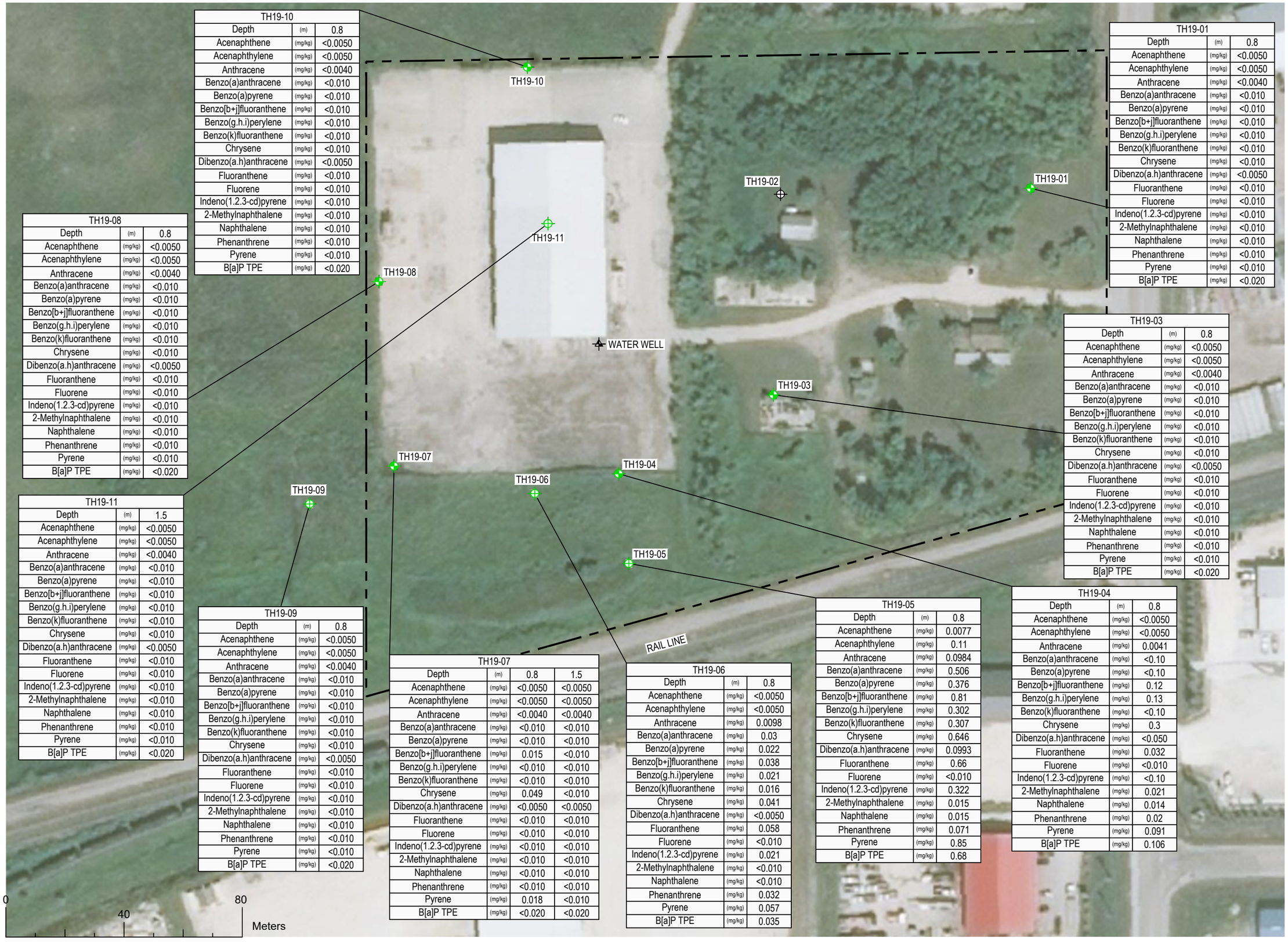
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

SOIL ANALYTICAL RESULTS - METALS

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 4



TH19-10		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010
Chrysene	(mg/kg)	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	<0.010
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	<0.010
Pyrene	(mg/kg)	<0.010
B[a]P TPE	(mg/kg)	<0.020

TH19-01		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010
Chrysene	(mg/kg)	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	<0.010
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	<0.010
Pyrene	(mg/kg)	<0.010
B[a]P TPE	(mg/kg)	<0.020

TH19-08		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010
Chrysene	(mg/kg)	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	<0.010
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	<0.010
Pyrene	(mg/kg)	<0.010
B[a]P TPE	(mg/kg)	<0.020

TH19-03		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010
Chrysene	(mg/kg)	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	<0.010
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	<0.010
Pyrene	(mg/kg)	<0.010
B[a]P TPE	(mg/kg)	<0.020

TH19-11		
Depth	(m)	1.5
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010
Chrysene	(mg/kg)	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	<0.010
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	<0.010
Pyrene	(mg/kg)	<0.010
B[a]P TPE	(mg/kg)	<0.020

TH19-09		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010
Chrysene	(mg/kg)	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	<0.010
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	<0.010
Pyrene	(mg/kg)	<0.010
B[a]P TPE	(mg/kg)	<0.020

TH19-07			
Depth	(m)	0.8	1.5
Acenaphthene	(mg/kg)	<0.0050	<0.0050
Acenaphthylene	(mg/kg)	<0.0050	<0.0050
Anthracene	(mg/kg)	<0.0040	<0.0040
Benzo(a)anthracene	(mg/kg)	<0.010	<0.010
Benzo(a)pyrene	(mg/kg)	<0.010	<0.010
Benzo[b+j]fluoranthene	(mg/kg)	0.015	<0.010
Benzo(g.h.i)perylene	(mg/kg)	<0.010	<0.010
Benzo(k)fluoranthene	(mg/kg)	<0.010	<0.010
Chrysene	(mg/kg)	0.049	<0.010
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050	<0.0050
Fluoranthene	(mg/kg)	<0.010	<0.010
Fluorene	(mg/kg)	<0.010	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.010	<0.010
2-Methylnaphthalene	(mg/kg)	<0.010	<0.010
Naphthalene	(mg/kg)	<0.010	<0.010
Phenanthrene	(mg/kg)	<0.010	<0.010
Pyrene	(mg/kg)	0.018	<0.010
B[a]P TPE	(mg/kg)	<0.020	<0.020

TH19-06		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	0.0098
Benzo(a)anthracene	(mg/kg)	0.03
Benzo(a)pyrene	(mg/kg)	0.022
Benzo[b+j]fluoranthene	(mg/kg)	0.038
Benzo(g.h.i)perylene	(mg/kg)	0.021
Benzo(k)fluoranthene	(mg/kg)	0.016
Chrysene	(mg/kg)	0.041
Dibenzo(a.h)anthracene	(mg/kg)	<0.0050
Fluoranthene	(mg/kg)	0.058
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	0.021
2-Methylnaphthalene	(mg/kg)	<0.010
Naphthalene	(mg/kg)	<0.010
Phenanthrene	(mg/kg)	0.032
Pyrene	(mg/kg)	0.057
B[a]P TPE	(mg/kg)	0.035

TH19-05		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	0.0077
Acenaphthylene	(mg/kg)	0.11
Anthracene	(mg/kg)	0.0984
Benzo(a)anthracene	(mg/kg)	0.506
Benzo(a)pyrene	(mg/kg)	0.376
Benzo[b+j]fluoranthene	(mg/kg)	0.81
Benzo(g.h.i)perylene	(mg/kg)	0.302
Benzo(k)fluoranthene	(mg/kg)	0.307
Chrysene	(mg/kg)	0.646
Dibenzo(a.h)anthracene	(mg/kg)	0.0993
Fluoranthene	(mg/kg)	0.66
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	0.322
2-Methylnaphthalene	(mg/kg)	0.015
Naphthalene	(mg/kg)	0.015
Phenanthrene	(mg/kg)	0.071
Pyrene	(mg/kg)	0.85
B[a]P TPE	(mg/kg)	0.68

TH19-04		
Depth	(m)	0.8
Acenaphthene	(mg/kg)	<0.0050
Acenaphthylene	(mg/kg)	<0.0050
Anthracene	(mg/kg)	0.0041
Benzo(a)anthracene	(mg/kg)	<0.10
Benzo(a)pyrene	(mg/kg)	<0.10
Benzo[b+j]fluoranthene	(mg/kg)	0.12
Benzo(g.h.i)perylene	(mg/kg)	0.13
Benzo(k)fluoranthene	(mg/kg)	<0.10
Chrysene	(mg/kg)	0.3
Dibenzo(a.h)anthracene	(mg/kg)	<0.050
Fluoranthene	(mg/kg)	0.032
Fluorene	(mg/kg)	<0.010
Indeno(1.2.3-cd)pyrene	(mg/kg)	<0.10
2-Methylnaphthalene	(mg/kg)	0.021
Naphthalene	(mg/kg)	0.014
Phenanthrene	(mg/kg)	0.02
Pyrene	(mg/kg)	0.091
B[a]P TPE	(mg/kg)	0.106

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
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TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

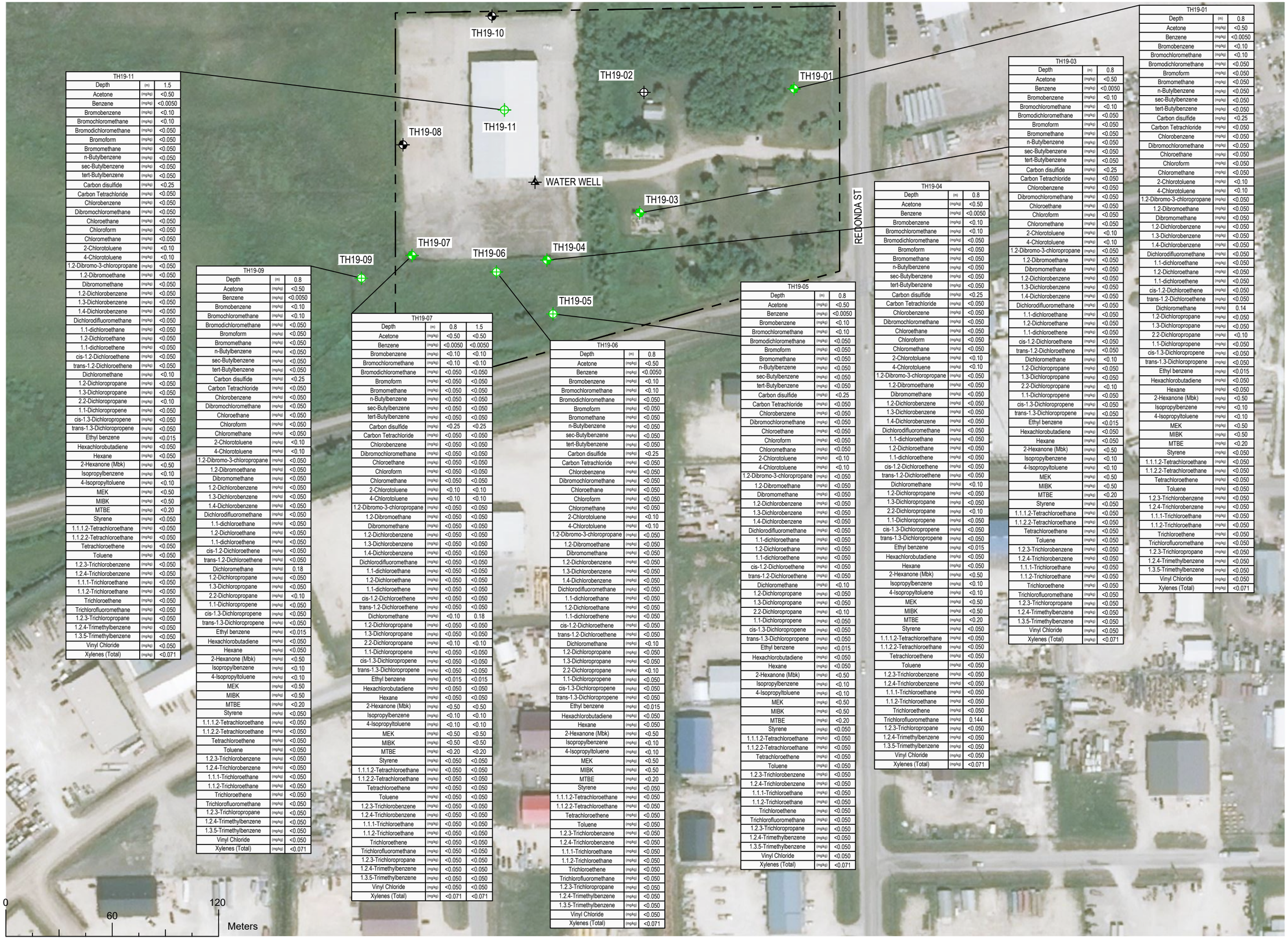
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

SOIL ANALYTICAL RESULTS - PAHs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 5



TH19-11

Depth	(m)	1.5
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	<0.10
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

TH19-09

Depth	(m)	0.8
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	0.18
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

TH19-07

Depth	(m)	0.8	1.5
Acetone	(mg/kg)	<0.50	<0.50
Benzene	(mg/kg)	<0.0050	<0.0050
Bromobenzene	(mg/kg)	<0.10	<0.10
Bromochloromethane	(mg/kg)	<0.10	<0.10
Bromodichloromethane	(mg/kg)	<0.050	<0.050
Bromoform	(mg/kg)	<0.050	<0.050
Bromomethane	(mg/kg)	<0.050	<0.050
n-Butylbenzene	(mg/kg)	<0.050	<0.050
sec-Butylbenzene	(mg/kg)	<0.050	<0.050
tert-Butylbenzene	(mg/kg)	<0.050	<0.050
Carbon disulfide	(mg/kg)	<0.25	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050	<0.050
Chlorobenzene	(mg/kg)	<0.050	<0.050
Dibromochloromethane	(mg/kg)	<0.050	<0.050
Chloroethane	(mg/kg)	<0.050	<0.050
Chloroform	(mg/kg)	<0.050	<0.050
Chloromethane	(mg/kg)	<0.050	<0.050
2-Chlorotoluene	(mg/kg)	<0.10	<0.10
4-Chlorotoluene	(mg/kg)	<0.10	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050	<0.050
Dibromomethane	(mg/kg)	<0.050	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050	<0.050
1.1-dichloroethane	(mg/kg)	<0.050	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050	<0.050
1.1-dichloroethene	(mg/kg)	<0.050	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050	<0.050
Dichloromethane	(mg/kg)	<0.10	0.18
1.2-Dichloropropane	(mg/kg)	<0.050	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050	<0.050
Ethyl benzene	(mg/kg)	<0.015	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050	<0.050
Hexane	(mg/kg)	<0.050	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50	<0.50
Isopropylbenzene	(mg/kg)	<0.10	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10	<0.10
MEK	(mg/kg)	<0.50	<0.50
MIBK	(mg/kg)	<0.50	<0.50
MTBE	(mg/kg)	<0.20	<0.20
Styrene	(mg/kg)	<0.050	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050	<0.050
Tetrachloroethene	(mg/kg)	<0.050	<0.050
Toluene	(mg/kg)	<0.050	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050	<0.050
Trichloroethene	(mg/kg)	<0.050	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050	<0.050
Vinyl Chloride	(mg/kg)	<0.050	<0.050
Xylenes (Total)	(mg/kg)	<0.071	<0.071

TH19-06

Depth	(m)	0.8
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	<0.10
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

TH19-05

Depth	(m)	0.8
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	<0.10
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

TH19-04

Depth	(m)	0.8
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	<0.10
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	0.144
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

TH19-03

Depth	(m)	0.8
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	<0.10
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

TH19-01

Depth	(m)	0.8
Acetone	(mg/kg)	<0.50
Benzene	(mg/kg)	<0.0050
Bromobenzene	(mg/kg)	<0.10
Bromochloromethane	(mg/kg)	<0.10
Bromodichloromethane	(mg/kg)	<0.050
Bromoform	(mg/kg)	<0.050
Bromomethane	(mg/kg)	<0.050
n-Butylbenzene	(mg/kg)	<0.050
sec-Butylbenzene	(mg/kg)	<0.050
tert-Butylbenzene	(mg/kg)	<0.050
Carbon disulfide	(mg/kg)	<0.25
Carbon Tetrachloride	(mg/kg)	<0.050
Chlorobenzene	(mg/kg)	<0.050
Dibromochloromethane	(mg/kg)	<0.050
Chloroethane	(mg/kg)	<0.050
Chloroform	(mg/kg)	<0.050
Chloromethane	(mg/kg)	<0.050
2-Chlorotoluene	(mg/kg)	<0.10
4-Chlorotoluene	(mg/kg)	<0.10
1.2-Dibromo-3-chloropropane	(mg/kg)	<0.050
1.2-Dibromoethane	(mg/kg)	<0.050
Dibromomethane	(mg/kg)	<0.050
1.2-Dichlorobenzene	(mg/kg)	<0.050
1.3-Dichlorobenzene	(mg/kg)	<0.050
1.4-Dichlorobenzene	(mg/kg)	<0.050
Dichlorodifluoromethane	(mg/kg)	<0.050
1.1-dichloroethane	(mg/kg)	<0.050
1.2-Dichloroethane	(mg/kg)	<0.050
1.1-dichloroethene	(mg/kg)	<0.050
cis-1.2-Dichloroethene	(mg/kg)	<0.050
trans-1.2-Dichloroethene	(mg/kg)	<0.050
Dichloromethane	(mg/kg)	0.14
1.2-Dichloropropane	(mg/kg)	<0.050
1.3-Dichloropropane	(mg/kg)	<0.050
2.2-Dichloropropane	(mg/kg)	<0.10
1.1-Dichloropropene	(mg/kg)	<0.050
cis-1.3-Dichloropropene	(mg/kg)	<0.050
trans-1.3-Dichloropropene	(mg/kg)	<0.050
Ethyl benzene	(mg/kg)	<0.015
Hexachlorobutadiene	(mg/kg)	<0.050
Hexane	(mg/kg)	<0.050
2-Hexanone (Mbk)	(mg/kg)	<0.50
Isopropylbenzene	(mg/kg)	<0.10
4-Isopropyltoluene	(mg/kg)	<0.10
MEK	(mg/kg)	<0.50
MIBK	(mg/kg)	<0.50
MTBE	(mg/kg)	<0.20
Styrene	(mg/kg)	<0.050
1.1.1.2-Tetrachloroethane	(mg/kg)	<0.050
1.1.2.2-Tetrachloroethane	(mg/kg)	<0.050
Tetrachloroethene	(mg/kg)	<0.050
Toluene	(mg/kg)	<0.050
1.2.3-Trichlorobenzene	(mg/kg)	<0.050
1.2.4-Trichlorobenzene	(mg/kg)	<0.050
1.1.1-Trichloroethane	(mg/kg)	<0.050
1.1.2-Trichloroethane	(mg/kg)	<0.050
Trichloroethene	(mg/kg)	<0.050
Trichlorofluoromethane	(mg/kg)	<0.050
1.2.3-Trichloropropane	(mg/kg)	<0.050
1.2.4-Trimethylbenzene	(mg/kg)	<0.050
1.3.5-Trimethylbenzene	(mg/kg)	<0.050
Vinyl Chloride	(mg/kg)	<0.050
Xylenes (Total)	(mg/kg)	<0.071

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

SOIL ANALYTICAL RESULTS - VOCs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 6

TH19-01		
Depth	(m)	0.8
PCB-Total	(mg/kg)	<0.050

TH19-03		
Depth	(m)	0.8
PCB-Total	(mg/kg)	<0.050

TH19-04		
Depth	(m)	0.8
PCB-Total	(mg/kg)	<0.050

TH19-09		
Depth	(m)	0.8
PCB-Total	(mg/kg)	<0.050

TH19-07			
Depth	(m)	0.8	1.5
PCB-Total	(mg/kg)	<0.050	<0.050

TH19-06		
Depth	(m)	0.8
PCB-Total	(mg/kg)	<0.050

TH19-05		
Depth	(m)	0.8
PCB-Total	(mg/kg)	<0.050

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.
- NO GUIDELINES.

NO.	REVISION	DATE	BY

PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

SOIL ANALYTICAL RESULTS - PCBs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 7

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:

APPROXIMATE PROPERTY LINE	
TEST HOLE	
MONITORING WELL	
WATER WELL	
GROUNDWATER ELEVATIONS	(230.32m)

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

GROUNDWATER ELEVATIONS PLAN

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 8

TH19-10		
Date		20-Jan-19
V.L.	(ppm)	<5
B	(mg/L)	<0.00050
T	(mg/L)	<0.00050
E	(mg/L)	<0.00050
X	(mg/L)	<0.00064
F1	(mg/L)	<0.10
F2	(mg/L)	<0.10
F3	(mg/L)	<0.25
F4	(mg/L)	<0.25

TAP (WATER WELL)		
Date		8-Jan-20
V.L.	(ppm)	<5
B	(mg/L)	<0.00050
T	(mg/L)	<0.00050
E	(mg/L)	<0.00050
X	(mg/L)	<0.00064
F1	(mg/L)	<0.10
F2	(mg/L)	<0.10
F3	(mg/L)	<0.25
F4	(mg/L)	<0.25

TH19-01		
Date		8-Jan-20
V.L.	(ppm)	<5
B	(mg/L)	<0.00050
T	(mg/L)	<0.00050
E	(mg/L)	<0.00050
X	(mg/L)	<0.00064
F1	(mg/L)	<0.10
F2	(mg/L)	<0.10
F3	(mg/L)	0.38
F4	(mg/L)	<0.25

TH19-08		
Date		20-Jan-19
V.L.	(ppm)	<5
B	(mg/L)	<0.00050
T	(mg/L)	<0.00050
E	(mg/L)	<0.00050
X	(mg/L)	<0.00064
F1	(mg/L)	<0.10
F2	(mg/L)	<0.10
F3	(mg/L)	57.2
F4	(mg/L)	74

TH19-03			DUP1
Date		20-Jan-19	
V.L.	(ppm)	<5	
B	(mg/L)	<0.00050	<0.00050
T	(mg/L)	<0.00050	<0.00050
E	(mg/L)	<0.00050	<0.00050
X	(mg/L)	<0.00064	<0.00064
F1	(mg/L)	<0.10	<0.10
F2	(mg/L)	<0.10	<0.10
F3	(mg/L)	<0.25	<0.25
F4	(mg/L)	<0.25	<0.25

TH19-07		
Date		20-Jan-19
V.L.	(ppm)	<5
B	(mg/L)	<0.00050
T	(mg/L)	0.0012
E	(mg/L)	<0.00050
X	(mg/L)	<0.00064
F1	(mg/L)	<0.10
F2	(mg/L)	<0.10
F3	(mg/L)	0.98
F4	(mg/L)	0.83

TH19-04		
Date		20-Jan-19
V.L.	(ppm)	<5
B	(mg/L)	<0.00050
T	(mg/L)	<0.00050
E	(mg/L)	<0.00050
X	(mg/L)	<0.00064
F1	(mg/L)	<0.10
F2	(mg/L)	<0.10
F3	(mg/L)	1.26
F4	(mg/L)	0.66

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

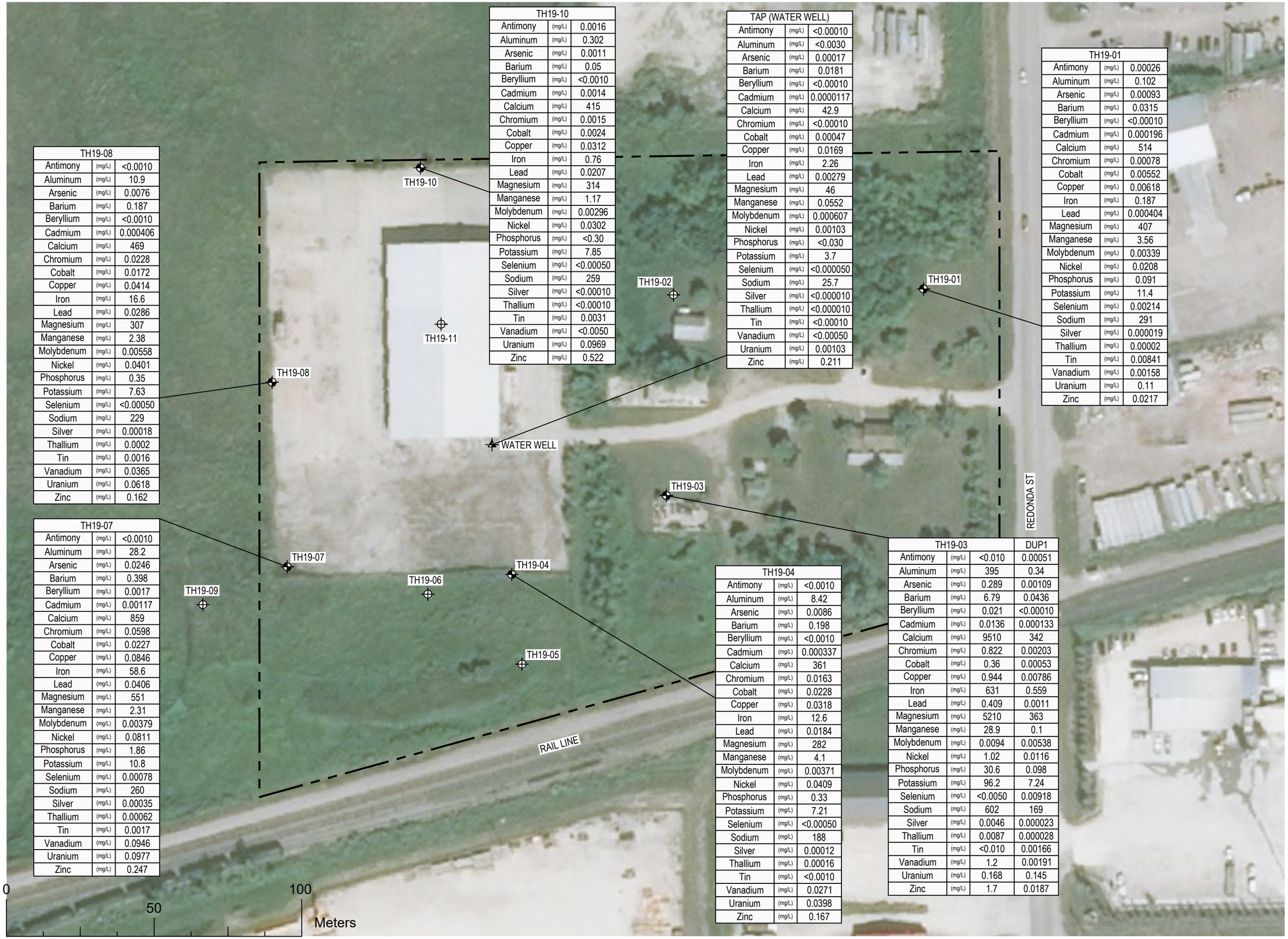
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

GROUNDWATER ANALYTICAL RESULTS - PHCs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 9



TH19-10		
Antimony	(mg/L)	0.0016
Aluminum	(mg/L)	0.302
Arsenic	(mg/L)	0.0011
Barium	(mg/L)	0.05
Beryllium	(mg/L)	<0.0010
Cadmium	(mg/L)	0.0014
Calcium	(mg/L)	415
Chromium	(mg/L)	0.0015
Cobalt	(mg/L)	0.0024
Copper	(mg/L)	0.0312
Iron	(mg/L)	0.76
Lead	(mg/L)	0.0207
Magnesium	(mg/L)	314
Manganese	(mg/L)	1.17
Molybdenum	(mg/L)	0.00296
Nickel	(mg/L)	0.0302
Phosphorus	(mg/L)	<0.30
Potassium	(mg/L)	7.85
Selenium	(mg/L)	<0.00050
Sodium	(mg/L)	259
Silver	(mg/L)	<0.00010
Thallium	(mg/L)	<0.00010
Tin	(mg/L)	0.0031
Vanadium	(mg/L)	<0.0050
Uranium	(mg/L)	0.0969
Zinc	(mg/L)	0.522

TAP (WATER WELL)		
Antimony	(mg/L)	<0.00010
Aluminum	(mg/L)	<0.0030
Arsenic	(mg/L)	0.00017
Barium	(mg/L)	0.0181
Beryllium	(mg/L)	<0.00010
Cadmium	(mg/L)	0.0000117
Calcium	(mg/L)	42.9
Chromium	(mg/L)	<0.00010
Cobalt	(mg/L)	0.00047
Copper	(mg/L)	0.0169
Iron	(mg/L)	2.26
Lead	(mg/L)	0.00279
Magnesium	(mg/L)	46
Manganese	(mg/L)	0.0552
Molybdenum	(mg/L)	0.000607
Nickel	(mg/L)	0.00103
Phosphorus	(mg/L)	<0.030
Potassium	(mg/L)	3.7
Selenium	(mg/L)	<0.000050
Sodium	(mg/L)	25.7
Silver	(mg/L)	<0.000010
Thallium	(mg/L)	<0.000010
Tin	(mg/L)	<0.00010
Vanadium	(mg/L)	<0.00050
Uranium	(mg/L)	0.00103
Zinc	(mg/L)	0.211

TH19-01		
Antimony	(mg/L)	0.00026
Aluminum	(mg/L)	0.102
Arsenic	(mg/L)	0.00093
Barium	(mg/L)	0.0315
Beryllium	(mg/L)	<0.00010
Cadmium	(mg/L)	0.000196
Calcium	(mg/L)	514
Chromium	(mg/L)	0.00078
Cobalt	(mg/L)	0.00552
Copper	(mg/L)	0.00618
Iron	(mg/L)	0.187
Lead	(mg/L)	0.000404
Magnesium	(mg/L)	407
Manganese	(mg/L)	3.56
Molybdenum	(mg/L)	0.00339
Nickel	(mg/L)	0.0208
Phosphorus	(mg/L)	0.091
Potassium	(mg/L)	11.4
Selenium	(mg/L)	0.00214
Sodium	(mg/L)	291
Silver	(mg/L)	0.000019
Thallium	(mg/L)	0.00002
Tin	(mg/L)	0.00841
Vanadium	(mg/L)	0.00158
Uranium	(mg/L)	0.11
Zinc	(mg/L)	0.0217

TH19-08		
Antimony	(mg/L)	<0.0010
Aluminum	(mg/L)	10.9
Arsenic	(mg/L)	0.0076
Barium	(mg/L)	0.187
Beryllium	(mg/L)	<0.0010
Cadmium	(mg/L)	0.000406
Calcium	(mg/L)	469
Chromium	(mg/L)	0.0228
Cobalt	(mg/L)	0.0172
Copper	(mg/L)	0.0414
Iron	(mg/L)	16.6
Lead	(mg/L)	0.0286
Magnesium	(mg/L)	307
Manganese	(mg/L)	2.38
Molybdenum	(mg/L)	0.00558
Nickel	(mg/L)	0.0401
Phosphorus	(mg/L)	0.35
Potassium	(mg/L)	7.63
Selenium	(mg/L)	<0.00050
Sodium	(mg/L)	229
Silver	(mg/L)	0.00018
Thallium	(mg/L)	0.0002
Tin	(mg/L)	0.0016
Vanadium	(mg/L)	0.0365
Uranium	(mg/L)	0.0618
Zinc	(mg/L)	0.162

TH19-07		
Antimony	(mg/L)	<0.0010
Aluminum	(mg/L)	28.2
Arsenic	(mg/L)	0.0246
Barium	(mg/L)	0.398
Beryllium	(mg/L)	0.0017
Cadmium	(mg/L)	0.00117
Calcium	(mg/L)	859
Chromium	(mg/L)	0.0598
Cobalt	(mg/L)	0.0227
Copper	(mg/L)	0.0846
Iron	(mg/L)	58.6
Lead	(mg/L)	0.0406
Magnesium	(mg/L)	551
Manganese	(mg/L)	2.31
Molybdenum	(mg/L)	0.00379
Nickel	(mg/L)	0.0811
Phosphorus	(mg/L)	1.86
Potassium	(mg/L)	10.8
Selenium	(mg/L)	0.00078
Sodium	(mg/L)	260
Silver	(mg/L)	0.00035
Thallium	(mg/L)	0.00062
Tin	(mg/L)	0.0017
Vanadium	(mg/L)	0.0946
Uranium	(mg/L)	0.0977
Zinc	(mg/L)	0.247

TH19-04		
Antimony	(mg/L)	<0.0010
Aluminum	(mg/L)	8.42
Arsenic	(mg/L)	0.0086
Barium	(mg/L)	0.198
Beryllium	(mg/L)	<0.0010
Cadmium	(mg/L)	0.000337
Calcium	(mg/L)	361
Chromium	(mg/L)	0.0163
Cobalt	(mg/L)	0.0228
Copper	(mg/L)	0.0318
Iron	(mg/L)	12.6
Lead	(mg/L)	0.0184
Magnesium	(mg/L)	282
Manganese	(mg/L)	4.1
Molybdenum	(mg/L)	0.00371
Nickel	(mg/L)	0.0409
Phosphorus	(mg/L)	0.33
Potassium	(mg/L)	7.21
Selenium	(mg/L)	<0.00050
Sodium	(mg/L)	188
Silver	(mg/L)	0.00012
Thallium	(mg/L)	0.00016
Tin	(mg/L)	<0.0010
Vanadium	(mg/L)	0.0271
Uranium	(mg/L)	0.0398
Zinc	(mg/L)	0.167

TH19-03			DUP1
Antimony	(mg/L)	<0.010	0.00051
Aluminum	(mg/L)	395	0.34
Arsenic	(mg/L)	0.289	0.00109
Barium	(mg/L)	6.79	0.0436
Beryllium	(mg/L)	0.021	<0.00010
Cadmium	(mg/L)	0.0136	0.000133
Calcium	(mg/L)	9510	342
Chromium	(mg/L)	0.822	0.00203
Cobalt	(mg/L)	0.36	0.00053
Copper	(mg/L)	0.944	0.00786
Iron	(mg/L)	631	0.559
Lead	(mg/L)	0.409	0.0011
Magnesium	(mg/L)	5210	363
Manganese	(mg/L)	28.9	0.1
Molybdenum	(mg/L)	0.0094	0.00538
Nickel	(mg/L)	1.02	0.0116
Phosphorus	(mg/L)	30.6	0.098
Potassium	(mg/L)	96.2	7.24
Selenium	(mg/L)	<0.0050	0.00918
Sodium	(mg/L)	602	169
Silver	(mg/L)	0.0046	0.000023
Thallium	(mg/L)	0.0087	0.000028
Tin	(mg/L)	<0.010	0.00166
Vanadium	(mg/L)	1.2	0.00191
Uranium	(mg/L)	0.168	0.145
Zinc	(mg/L)	1.7	0.0187

wood.
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.
- NO AVAILABLE GUIDELINES.

NO.	REVISION	DATE	BY

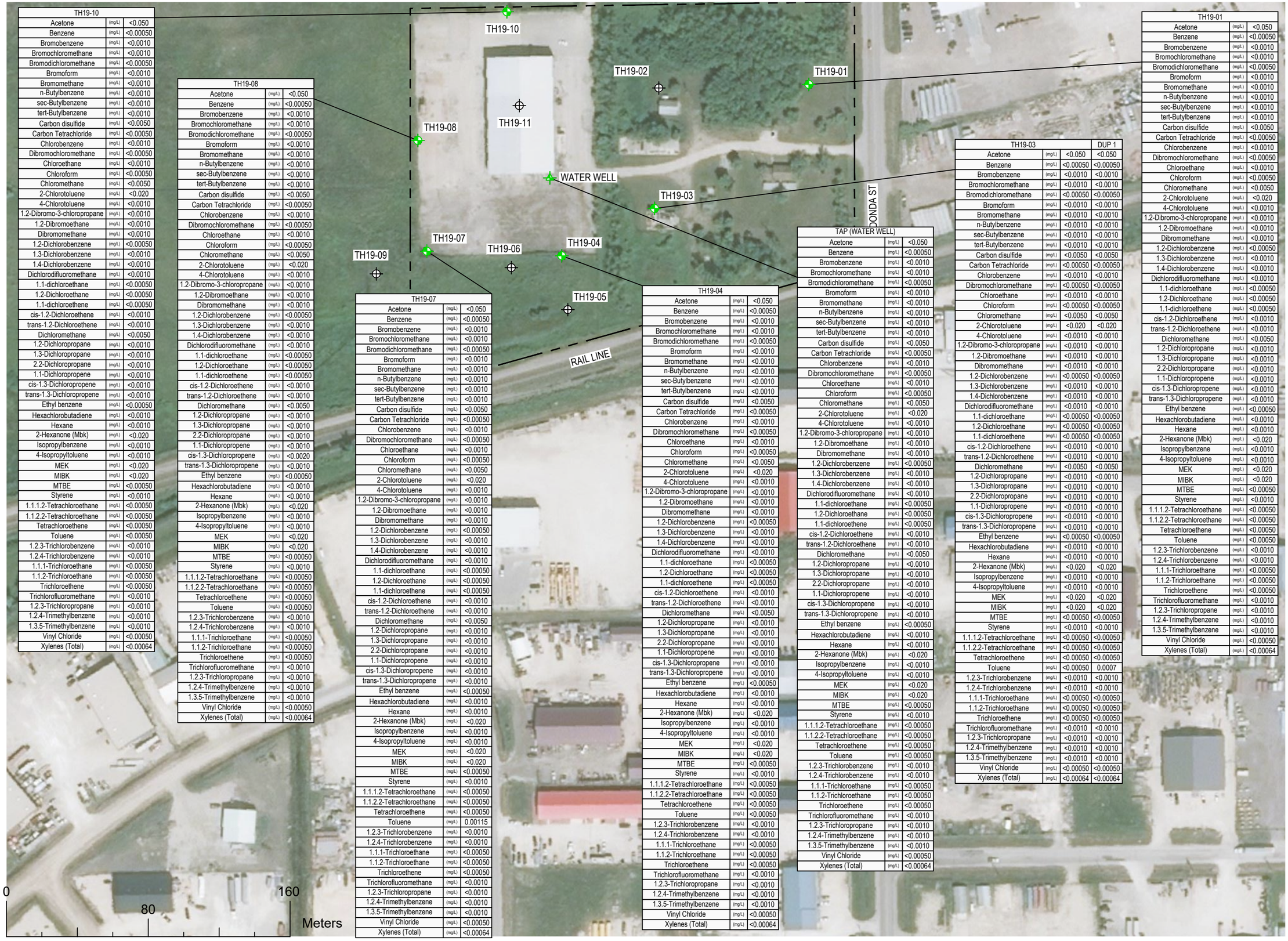
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

GROUNDWATER ANALYTICAL RESULTS - METALS

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 10



TH19-10		
Acetone	(mg/L)	<0.050
Benzene	(mg/L)	<0.00050
Bromobenzene	(mg/L)	<0.0010
Bromochloromethane	(mg/L)	<0.0010
Bromodichloromethane	(mg/L)	<0.00050
Bromoform	(mg/L)	<0.0010
Bromomethane	(mg/L)	<0.0010
n-Butylbenzene	(mg/L)	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010
Carbon disulfide	(mg/L)	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050
Chlorobenzene	(mg/L)	<0.0010
Dibromochloromethane	(mg/L)	<0.00050
Chloroethane	(mg/L)	<0.0010
Chloroform	(mg/L)	<0.00050
Chloromethane	(mg/L)	<0.0050
2-Chlorotoluene	(mg/L)	<0.020
4-Chlorotoluene	(mg/L)	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010
Dibromomethane	(mg/L)	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010
Dichloromethane	(mg/L)	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010
Ethyl benzene	(mg/L)	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010
Hexane	(mg/L)	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020
Isopropylbenzene	(mg/L)	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010
MEK	(mg/L)	<0.020
MIBK	(mg/L)	<0.020
MTBE	(mg/L)	<0.00050
Styrene	(mg/L)	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050
Tetrachloroethene	(mg/L)	<0.00050
Toluene	(mg/L)	<0.00050
1.2.3-Trichlorobenzene	(mg/L)	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050
Trichloroethene	(mg/L)	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010
Vinyl Chloride	(mg/L)	<0.00050
Xylenes (Total)	(mg/L)	<0.00064

TH19-08		
Acetone	(mg/L)	<0.050
Benzene	(mg/L)	<0.00050
Bromobenzene	(mg/L)	<0.0010
Bromochloromethane	(mg/L)	<0.0010
Bromodichloromethane	(mg/L)	<0.00050
Bromoform	(mg/L)	<0.0010
Bromomethane	(mg/L)	<0.0010
n-Butylbenzene	(mg/L)	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010
Carbon disulfide	(mg/L)	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050
Chlorobenzene	(mg/L)	<0.0010
Dibromochloromethane	(mg/L)	<0.00050
Chloroethane	(mg/L)	<0.0010
Chloroform	(mg/L)	<0.00050
Chloromethane	(mg/L)	<0.0050
2-Chlorotoluene	(mg/L)	<0.020
4-Chlorotoluene	(mg/L)	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010
Dibromomethane	(mg/L)	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010
Dichloromethane	(mg/L)	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010
Ethyl benzene	(mg/L)	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010
Hexane	(mg/L)	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020
Isopropylbenzene	(mg/L)	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010
MEK	(mg/L)	<0.020
MIBK	(mg/L)	<0.020
MTBE	(mg/L)	<0.00050
Styrene	(mg/L)	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050
Tetrachloroethene	(mg/L)	<0.00050
Toluene	(mg/L)	<0.00050
1.2.3-Trichlorobenzene	(mg/L)	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050
Trichloroethene	(mg/L)	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010
Vinyl Chloride	(mg/L)	<0.00050
Xylenes (Total)	(mg/L)	<0.00064

TH19-07		
Acetone	(mg/L)	<0.050
Benzene	(mg/L)	<0.00050
Bromobenzene	(mg/L)	<0.0010
Bromochloromethane	(mg/L)	<0.0010
Bromodichloromethane	(mg/L)	<0.00050
Bromoform	(mg/L)	<0.0010
Bromomethane	(mg/L)	<0.0010
n-Butylbenzene	(mg/L)	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010
Carbon disulfide	(mg/L)	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050
Chlorobenzene	(mg/L)	<0.0010
Dibromochloromethane	(mg/L)	<0.00050
Chloroethane	(mg/L)	<0.0010
Chloroform	(mg/L)	<0.00050
Chloromethane	(mg/L)	<0.0050
2-Chlorotoluene	(mg/L)	<0.020
4-Chlorotoluene	(mg/L)	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010
Dibromomethane	(mg/L)	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010
Dichloromethane	(mg/L)	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010
Ethyl benzene	(mg/L)	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010
Hexane	(mg/L)	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020
Isopropylbenzene	(mg/L)	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010
MEK	(mg/L)	<0.020
MIBK	(mg/L)	<0.020
MTBE	(mg/L)	<0.00050
Styrene	(mg/L)	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050
Tetrachloroethene	(mg/L)	<0.00050
Toluene	(mg/L)	0.00115
1.2.3-Trichlorobenzene	(mg/L)	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050
Trichloroethene	(mg/L)	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010
Vinyl Chloride	(mg/L)	<0.00050
Xylenes (Total)	(mg/L)	<0.00064

TH19-04		
Acetone	(mg/L)	<0.050
Benzene	(mg/L)	<0.00050
Bromobenzene	(mg/L)	<0.0010
Bromochloromethane	(mg/L)	<0.0010
Bromodichloromethane	(mg/L)	<0.00050
Bromoform	(mg/L)	<0.0010
Bromomethane	(mg/L)	<0.0010
n-Butylbenzene	(mg/L)	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010
Carbon disulfide	(mg/L)	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050
Chlorobenzene	(mg/L)	<0.0010
Dibromochloromethane	(mg/L)	<0.00050
Chloroethane	(mg/L)	<0.0010
Chloroform	(mg/L)	<0.00050
Chloromethane	(mg/L)	<0.0050
2-Chlorotoluene	(mg/L)	<0.020
4-Chlorotoluene	(mg/L)	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010
Dibromomethane	(mg/L)	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010
Dichloromethane	(mg/L)	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010
Ethyl benzene	(mg/L)	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010
Hexane	(mg/L)	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020
Isopropylbenzene	(mg/L)	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010
MEK	(mg/L)	<0.020
MIBK	(mg/L)	<0.020
MTBE	(mg/L)	<0.00050
Styrene	(mg/L)	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050
Tetrachloroethene	(mg/L)	<0.00050
Toluene	(mg/L)	<0.00050
1.2.3-Trichlorobenzene	(mg/L)	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050
Trichloroethene	(mg/L)	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010
Vinyl Chloride	(mg/L)	<0.00050
Xylenes (Total)	(mg/L)	<0.00064

TAP (WATER WELL)		
Acetone	(mg/L)	<0.050
Benzene	(mg/L)	<0.00050
Bromobenzene	(mg/L)	<0.0010
Bromochloromethane	(mg/L)	<0.0010
Bromodichloromethane	(mg/L)	<0.00050
Bromoform	(mg/L)	<0.0010
Bromomethane	(mg/L)	<0.0010
n-Butylbenzene	(mg/L)	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010
Carbon disulfide	(mg/L)	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050
Chlorobenzene	(mg/L)	<0.0010
Dibromochloromethane	(mg/L)	<0.00050
Chloroethane	(mg/L)	<0.0010
Chloroform	(mg/L)	<0.00050
Chloromethane	(mg/L)	<0.0050
2-Chlorotoluene	(mg/L)	<0.020
4-Chlorotoluene	(mg/L)	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010
Dibromomethane	(mg/L)	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010
Dichloromethane	(mg/L)	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010
Ethyl benzene	(mg/L)	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010
Hexane	(mg/L)	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020
Isopropylbenzene	(mg/L)	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010
MEK	(mg/L)	<0.020
MIBK	(mg/L)	<0.020
MTBE	(mg/L)	<0.00050
Styrene	(mg/L)	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050
Tetrachloroethene	(mg/L)	<0.00050
Toluene	(mg/L)	<0.00050
1.2.3-Trichlorobenzene	(mg/L)	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050
Trichloroethene	(mg/L)	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010
Vinyl Chloride	(mg/L)	<0.00050
Xylenes (Total)	(mg/L)	<0.00064

TH19-03			DUP 1
Acetone	(mg/L)	<0.050	<0.050
Benzene	(mg/L)	<0.00050	<0.00050
Bromobenzene	(mg/L)	<0.0010	<0.0010
Bromochloromethane	(mg/L)	<0.0010	<0.0010
Bromodichloromethane	(mg/L)	<0.00050	<0.00050
Bromoform	(mg/L)	<0.0010	<0.0010
Bromomethane	(mg/L)	<0.0010	<0.0010
n-Butylbenzene	(mg/L)	<0.0010	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010	<0.0010
Carbon disulfide	(mg/L)	<0.0050	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050	<0.00050
Chlorobenzene	(mg/L)	<0.0010	<0.0010
Dibromochloromethane	(mg/L)	<0.00050	<0.00050
Chloroethane	(mg/L)	<0.0010	<0.0010
Chloroform	(mg/L)	<0.00050	<0.00050
Chloromethane	(mg/L)	<0.0050	<0.0050
2-Chlorotoluene	(mg/L)	<0.020	<0.020
4-Chlorotoluene	(mg/L)	<0.0010	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010	<0.0010
Dibromomethane	(mg/L)	<0.0010	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010	<0.0010
Dichloromethane	(mg/L)	<0.0050	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010	<0.0010
Ethyl benzene	(mg/L)	<0.00050	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010	<0.0010
Hexane	(mg/L)	<0.0010	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020	<0.020
Isopropylbenzene	(mg/L)	<0.0010	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010	<0.0010
MEK	(mg/L)	<0.020	<0.020
MIBK	(mg/L)	<0.020	<0.020
MTBE	(mg/L)	<0.00050	<0.00050
Styrene	(mg/L)	<0.0010	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050	<0.00050
Tetrachloroethene	(mg/L)	<0.00050	<0.00050
Toluene	(mg/L)	<0.00050	0.0007
1.2.3-Trichlorobenzene	(mg/L)	<0.0010	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050	<0.00050
Trichloroethene	(mg/L)	<0.00050	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010	<0.0010
Vinyl Chloride	(mg/L)	<0.00050	<0.00050
Xylenes (Total)	(mg/L)	<0.00064	<0.00064

TH19-01		
Acetone	(mg/L)	<0.050
Benzene	(mg/L)	<0.00050
Bromobenzene	(mg/L)	<0.0010
Bromochloromethane	(mg/L)	<0.0010
Bromodichloromethane	(mg/L)	<0.00050
Bromoform	(mg/L)	<0.0010
Bromomethane	(mg/L)	<0.0010
n-Butylbenzene	(mg/L)	<0.0010
sec-Butylbenzene	(mg/L)	<0.0010
tert-Butylbenzene	(mg/L)	<0.0010
Carbon disulfide	(mg/L)	<0.0050
Carbon Tetrachloride	(mg/L)	<0.00050
Chlorobenzene	(mg/L)	<0.0010
Dibromochloromethane	(mg/L)	<0.00050
Chloroethane	(mg/L)	<0.0010
Chloroform	(mg/L)	<0.00050
Chloromethane	(mg/L)	<0.0050
2-Chlorotoluene	(mg/L)	<0.020
4-Chlorotoluene	(mg/L)	<0.0010
1.2-Dibromo-3-chloropropane	(mg/L)	<0.0010
1.2-Dibromoethane	(mg/L)	<0.0010
Dibromomethane	(mg/L)	<0.0010
1.2-Dichlorobenzene	(mg/L)	<0.00050
1.3-Dichlorobenzene	(mg/L)	<0.0010
1.4-Dichlorobenzene	(mg/L)	<0.0010
Dichlorodifluoromethane	(mg/L)	<0.0010
1.1-dichloroethane	(mg/L)	<0.00050
1.2-Dichloroethane	(mg/L)	<0.00050
1.1-dichloroethene	(mg/L)	<0.00050
cis-1.2-Dichloroethene	(mg/L)	<0.0010
trans-1.2-Dichloroethene	(mg/L)	<0.0010
Dichloromethane	(mg/L)	<0.0050
1.2-Dichloropropane	(mg/L)	<0.0010
1.3-Dichloropropane	(mg/L)	<0.0010
2.2-Dichloropropane	(mg/L)	<0.0010
1.1-Dichloropropene	(mg/L)	<0.0010
cis-1.3-Dichloropropene	(mg/L)	<0.0010
trans-1.3-Dichloropropene	(mg/L)	<0.0010
Ethyl benzene	(mg/L)	<0.00050
Hexachlorobutadiene	(mg/L)	<0.0010
Hexane	(mg/L)	<0.0010
2-Hexanone (Mbk)	(mg/L)	<0.020
Isopropylbenzene	(mg/L)	<0.0010
4-Isopropyltoluene	(mg/L)	<0.0010
MEK	(mg/L)	<0.020
MIBK	(mg/L)	<0.020
MTBE	(mg/L)	<0.00050
Styrene	(mg/L)	<0.0010
1.1.1.2-Tetrachloroethane	(mg/L)	<0.00050
1.1.2.2-Tetrachloroethane	(mg/L)	<0.00050
Tetrachloroethene	(mg/L)	<0.00050
Toluene	(mg/L)	<0.00050
1.2.3-Trichlorobenzene	(mg/L)	<0.0010
1.2.4-Trichlorobenzene	(mg/L)	<0.0010
1.1.1-Trichloroethane	(mg/L)	<0.00050
1.1.2-Trichloroethane	(mg/L)	<0.00050
Trichloroethene	(mg/L)	<0.00050
Trichlorofluoromethane	(mg/L)	<0.0010
1.2.3-Trichloropropane	(mg/L)	<0.0010
1.2.4-Trimethylbenzene	(mg/L)	<0.0010
1.3.5-Trimethylbenzene	(mg/L)	<0.0010
Vinyl Chloride	(mg/L)	<0.00050
Xylenes (Total)	(mg/L)	<0.00064

wood.
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TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

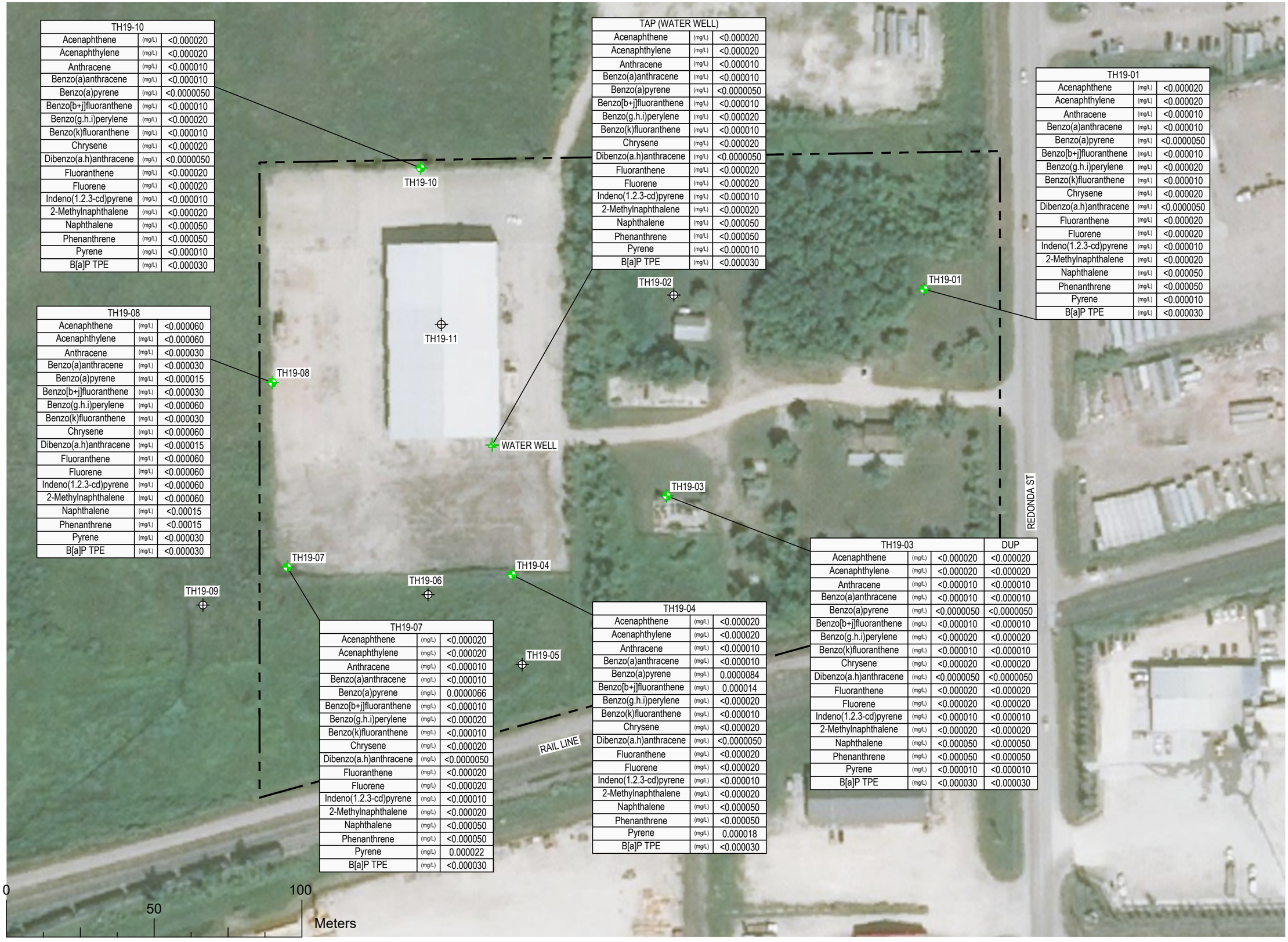
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

GROUNDWATER ANALYTICAL RESULTS - VOCs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 11



TH19-10		
Acenaphthene	(mg/L)	<0.000020
Acenaphthylene	(mg/L)	<0.000020
Anthracene	(mg/L)	<0.000010
Benzo(a)anthracene	(mg/L)	<0.000010
Benzo(a)pyrene	(mg/L)	<0.0000050
Benzo[b+j]fluoranthene	(mg/L)	<0.000010
Benzo(g.h.i)perylene	(mg/L)	<0.000020
Benzo(k)fluoranthene	(mg/L)	<0.000010
Chrysene	(mg/L)	<0.000020
Dibenzo(a.h)anthracene	(mg/L)	<0.0000050
Fluoranthene	(mg/L)	<0.000020
Fluorene	(mg/L)	<0.000020
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000010
2-Methylnaphthalene	(mg/L)	<0.000020
Naphthalene	(mg/L)	<0.000050
Phenanthrene	(mg/L)	<0.000050
Pyrene	(mg/L)	<0.000010
B[a]P TPE	(mg/L)	<0.000030

TAP (WATER WELL)		
Acenaphthene	(mg/L)	<0.000020
Acenaphthylene	(mg/L)	<0.000020
Anthracene	(mg/L)	<0.000010
Benzo(a)anthracene	(mg/L)	<0.000010
Benzo(a)pyrene	(mg/L)	<0.0000050
Benzo[b+j]fluoranthene	(mg/L)	<0.000010
Benzo(g.h.i)perylene	(mg/L)	<0.000020
Benzo(k)fluoranthene	(mg/L)	<0.000010
Chrysene	(mg/L)	<0.000020
Dibenzo(a.h)anthracene	(mg/L)	<0.0000050
Fluoranthene	(mg/L)	<0.000020
Fluorene	(mg/L)	<0.000020
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000010
2-Methylnaphthalene	(mg/L)	<0.000020
Naphthalene	(mg/L)	<0.000050
Phenanthrene	(mg/L)	<0.000050
Pyrene	(mg/L)	<0.000010
B[a]P TPE	(mg/L)	<0.000030

TH19-01		
Acenaphthene	(mg/L)	<0.000020
Acenaphthylene	(mg/L)	<0.000020
Anthracene	(mg/L)	<0.000010
Benzo(a)anthracene	(mg/L)	<0.000010
Benzo(a)pyrene	(mg/L)	<0.0000050
Benzo[b+j]fluoranthene	(mg/L)	<0.000010
Benzo(g.h.i)perylene	(mg/L)	<0.000020
Benzo(k)fluoranthene	(mg/L)	<0.000010
Chrysene	(mg/L)	<0.000020
Dibenzo(a.h)anthracene	(mg/L)	<0.0000050
Fluoranthene	(mg/L)	<0.000020
Fluorene	(mg/L)	<0.000020
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000010
2-Methylnaphthalene	(mg/L)	<0.000020
Naphthalene	(mg/L)	<0.000050
Phenanthrene	(mg/L)	<0.000050
Pyrene	(mg/L)	<0.000010
B[a]P TPE	(mg/L)	<0.000030

TH19-08		
Acenaphthene	(mg/L)	<0.000060
Acenaphthylene	(mg/L)	<0.000060
Anthracene	(mg/L)	<0.000030
Benzo(a)anthracene	(mg/L)	<0.000030
Benzo(a)pyrene	(mg/L)	<0.000015
Benzo[b+j]fluoranthene	(mg/L)	<0.000030
Benzo(g.h.i)perylene	(mg/L)	<0.000060
Benzo(k)fluoranthene	(mg/L)	<0.000030
Chrysene	(mg/L)	<0.000060
Dibenzo(a.h)anthracene	(mg/L)	<0.000015
Fluoranthene	(mg/L)	<0.000060
Fluorene	(mg/L)	<0.000060
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000060
2-Methylnaphthalene	(mg/L)	<0.000060
Naphthalene	(mg/L)	<0.00015
Phenanthrene	(mg/L)	<0.00015
Pyrene	(mg/L)	<0.000030
B[a]P TPE	(mg/L)	<0.000030

TH19-07		
Acenaphthene	(mg/L)	<0.000020
Acenaphthylene	(mg/L)	<0.000020
Anthracene	(mg/L)	<0.000010
Benzo(a)anthracene	(mg/L)	<0.000010
Benzo(a)pyrene	(mg/L)	0.0000066
Benzo[b+j]fluoranthene	(mg/L)	<0.000010
Benzo(g.h.i)perylene	(mg/L)	<0.000020
Benzo(k)fluoranthene	(mg/L)	<0.000010
Chrysene	(mg/L)	<0.000020
Dibenzo(a.h)anthracene	(mg/L)	<0.0000050
Fluoranthene	(mg/L)	<0.000020
Fluorene	(mg/L)	<0.000020
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000010
2-Methylnaphthalene	(mg/L)	<0.000020
Naphthalene	(mg/L)	<0.000050
Phenanthrene	(mg/L)	<0.000050
Pyrene	(mg/L)	0.000022
B[a]P TPE	(mg/L)	<0.000030

TH19-04		
Acenaphthene	(mg/L)	<0.000020
Acenaphthylene	(mg/L)	<0.000020
Anthracene	(mg/L)	<0.000010
Benzo(a)anthracene	(mg/L)	<0.000010
Benzo(a)pyrene	(mg/L)	0.0000084
Benzo[b+j]fluoranthene	(mg/L)	0.000014
Benzo(g.h.i)perylene	(mg/L)	<0.000020
Benzo(k)fluoranthene	(mg/L)	<0.000010
Chrysene	(mg/L)	<0.000020
Dibenzo(a.h)anthracene	(mg/L)	<0.0000050
Fluoranthene	(mg/L)	<0.000020
Fluorene	(mg/L)	<0.000020
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000010
2-Methylnaphthalene	(mg/L)	<0.000020
Naphthalene	(mg/L)	<0.000050
Phenanthrene	(mg/L)	<0.000050
Pyrene	(mg/L)	0.000018
B[a]P TPE	(mg/L)	<0.000030

TH19-03			DUP
Acenaphthene	(mg/L)	<0.000020	<0.000020
Acenaphthylene	(mg/L)	<0.000020	<0.000020
Anthracene	(mg/L)	<0.000010	<0.000010
Benzo(a)anthracene	(mg/L)	<0.000010	<0.000010
Benzo(a)pyrene	(mg/L)	<0.0000050	<0.0000050
Benzo[b+j]fluoranthene	(mg/L)	<0.000010	<0.000010
Benzo(g.h.i)perylene	(mg/L)	<0.000020	<0.000020
Benzo(k)fluoranthene	(mg/L)	<0.000010	<0.000010
Chrysene	(mg/L)	<0.000020	<0.000020
Dibenzo(a.h)anthracene	(mg/L)	<0.0000050	<0.0000050
Fluoranthene	(mg/L)	<0.000020	<0.000020
Fluorene	(mg/L)	<0.000020	<0.000020
Indeno(1.2.3-cd)pyrene	(mg/L)	<0.000010	<0.000010
2-Methylnaphthalene	(mg/L)	<0.000020	<0.000020
Naphthalene	(mg/L)	<0.000050	<0.000050
Phenanthrene	(mg/L)	<0.000050	<0.000050
Pyrene	(mg/L)	<0.000010	<0.000010
B[a]P TPE	(mg/L)	<0.000030	<0.000030

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TERVITA CORPORATION

LEGEND:
- APPROXIMATE PROPERTY LINE
- TEST HOLE
- MONITORING WELL
- WATER WELL
- BELOW CRITERIA
- ABOVE CRITERIA

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

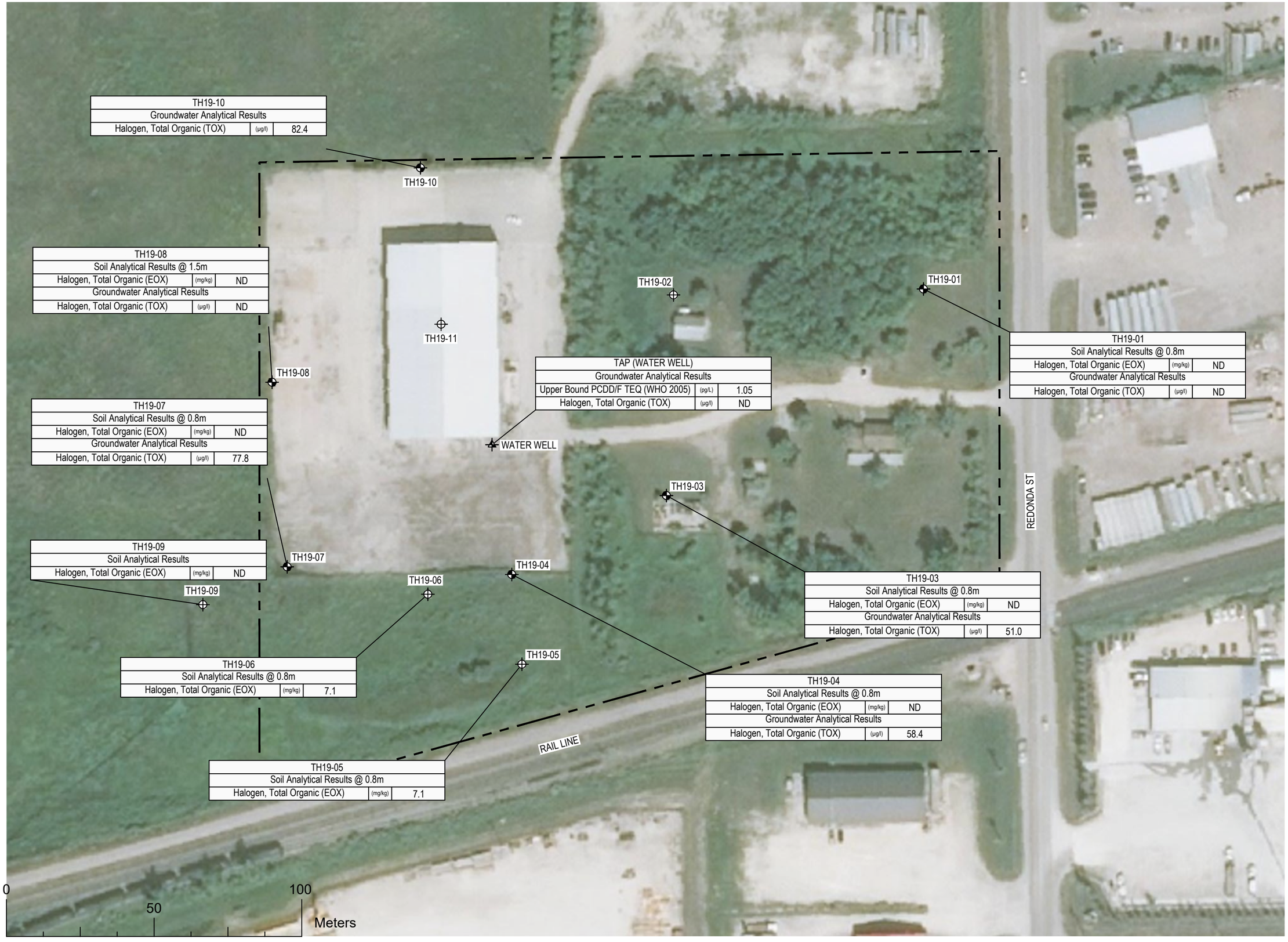
PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

GROUNDWATER ANALYTICAL RESULTS - PAHs

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 12



wood.
440 DOVERCOURT DRIVE
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TERVITA CORPORATION

LEGEND:
APPROXIMATE PROPERTY LINE
TEST HOLE
MONITORING WELL
WATER WELL
*ND - NON DETECT

NOTE:
- SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- IMAGES FROM AUTODESK IMAGERY.

NO.	REVISION	DATE	BY

PHASE II ENVIRONMENTAL SITE ASSESSMENT

999 REDONDA STREET
RURAL MUNICIPALITY OF SPRINGFIELD
OAKBANK, MANITOBA

ANALYTICAL RESULTS -
EOX,TOX, DIOXINS, FURANS

SCALE:	AS SHOWN
DATE:	MAY 2020
DRAWN BY:	MD
PROJECT NO.:	WX18979

FIGURE 13

Tables

TABLE 1: SITE AND SURROUNDING LAND USE

Direction	Land Use	Approx. Distance (m)
Site	House/office, a warehouse building, and two storage sheds	-
North	Commercial storage yard	Adjacent
East	Redonda Street followed by commercial/industrial property	Adjacent/ 30
South	Rail line followed by commercial property	Adjacent/ 30
West	Vacant, undeveloped grassland	Adjacent

Notes:

- m - metres

TABLE 2: FIELD OBSERVATIONS

Sample Depth	Sample Number	Test Hole										
		TH19-01	TH19-02	TH19-03	TH19-04	TH19-05	TH19-06	TH19-07	TH19-08	TH19-09	TH19-10	TH19-11
		16-Dec-20	16-Dec-20	03-Dec-19	03-Dec-19	16-Dec-20	16-Dec-20	03-Dec-19	03-Dec-19	16-Dec-20	03-Dec-19	20-Dec-19
0.6 - 0.8	1	<5	<5	<5	<5	45	<5	<5	<5	<5	<5	<5
1.4 - 1.5	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2.1 - 2.3	3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2.9 - 3.0	4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
3.7 - 3.8	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	**<5**
4.4 - 4.6	6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

Notes:

- All vapours in parts per million (ppm)
- **BOLD** indicates staining

Sample submitted for analytical chemistry; no exceedances noted

Sample submitted for analytical chemistry; exceedances noted

wood.

TABLE 3: SOIL ANALYTICAL RESULTS - PHCs

Test Hole	Sample ID	Depth (m)	Date (dd-mmm-yy)	Soil Vapour Concentration (ppm_v)	Grain Size (%>75 µm)	Concentration (mg/kg)							
						Benzene	Toluene	Ethylbenzene	Xylenes	PHC Fraction F1	PHC Fraction F2	PHC Fraction F3	PHC Fraction F4
TH19-01	TH19-01 @ 0.8	0.8	16-Dec-19	<5	2.0	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-02	TH19-02 @ 0.8	0.8	16-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-03	TH19-03 @ 0.8	0.8	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-04	TH19-04 @ 0.8	0.8	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<250	2260	2500
TH19-05	TH19-05 @ 0.8	0.8	16-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-06	TH19-06 @ 0.8	0.8	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-07	TH19-07 @ 0.8	0.8	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<130	480	500
	TH19-07 @ 1.5	1.5	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-08	TH19-08 @ 0.8	0.8	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	52
TH19-09	TH19-09 @ 0.8	0.8	16-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-10	TH19-10 @ 0.8	0.8	03-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
TH19-11	TH19-11 @ 1.5	1.5	16-Dec-19	<5	---	<0.0050	<0.050	<0.015	<0.071	<10	<25	<50	<50
Applicable Industrial Soil Guidelines - CCME [1]			**EQG - Surface Soil (≤1.5 m)**			**2.8**	**330**	**430**	**230**	**NG**	**NG**	**NG**	**NG**
			CWS - Surface Soil (≤1.5 m)			**NG**	**NG**	**NG**	**NG**	**320**	**260**	**2500**	**6600**
			EQG - Subsoil (>1.5)			**2.9**	**13000**	**6700**	**1600**	**NG**	**NG**	**NG**	**NG**
			CWS - Subsoil (>1.5)			**NG**	**NG**	**NG**	**NG**	**800**	**1,000**	**5000**	**10000**

Notes:

- mg/kg - concentration in milligrams per kilogram
- m - metres
- ppm_v - parts per million organic vapour
- PHC Fraction F1 - volatile petroleum hydrocarbons ($C_6 – C_{10}$), less BTEX
- PHC Fraction F2 - extractable petroleum hydrocarbons ($C_{10} – C_{16}$)
- PHC Fraction F3 - extractable petroleum hydrocarbons ($C_{16} – C_{34}$)
- PHC Fraction F4 - extractable petroleum hydrocarbons ($C_{34} – C_{50}$)
- NM - Not Measured
- ND - not detected
- NG - no guideline
- -- - not analyzed

BOLD exceeds applicable soil guideline

- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Canada Ltd.
- CCME EQG Criteria – industrial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updates to 2019). The benzene concentration is based on one in one hundred thousand (10^{-5}) incremental risk of cancer. See Appendix G.
- CCME CWS PHC Criteria - industrial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2001, revised 2008. See Appendix G.

[1] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . In this instance the reporting standards are equal to the guidelines and as such are not represented as a separate line.

TABLE 4: SOIL ANALYTICAL RESULTS - METALS

Parameter	Units	TH19-01 @ 0.8M	TH19-03 @ 0.8M	TH19-04 @ 0.8M	TH19-05 @ 0.8M	TH19-06 @ 0.8M	TH19-07 @ 0.8M	TH19-07 @ 1.5M	TH19-08 @ 0.8M	TH19-09 @ 0.8M	TH19-10 @ 0.8M	TH19-11 @ 1.5M	Assessment Criteria
Antimony	mg/kg (ppm)	0.31	0.5	1.98	0.43	0.42	<0.10	0.52	0.46	0.52	0.68	0.32	**40**
Aluminum	mg/kg (ppm)	31500	27200	1400	26400	22900	971	13800	15700	26900	23900	23600	**NG**
Arsenic	mg/kg (ppm)	9.34	9.15	1.24	8.46	7.24	0.61	9.03	5.52	9.35	5.22	7.04	**12**
Barium	mg/kg (ppm)	195	196	69.8	193	212	7.36	172	311	199	176	194	**2000**
Beryllium	mg/kg (ppm)	1.34	1.03	<0.10	1.12	0.89	<0.10	0.66	0.82	1.34	1.04	0.98	**8**
Cadmium	mg/kg (ppm)	0.164	0.365	0.552	0.497	0.318	0.02	0.286	0.213	0.077	0.441	0.359	**22**
Calcium	mg/kg (ppm)	7110	63800	147000	15800	65600	200000	74900	98200	9990	66000	58500	**NG**
Chromium	mg/kg (ppm)	53.3	43.3	7.64	44.7	38.7	2.39	20.9	26.6	48	38.3	41.1	**87**
Cobalt	mg/kg (ppm)	16	12.3	1.72	13.7	12	1.04	8.22	9.89	15.3	11.7	12.3	**300**
Copper	mg/kg (ppm)	31.8	29.9	28.9	35.4	27.9	2.83	21.3	23	33.1	34.9	28	**91**
Iron	mg/kg (ppm)	35600	28100	5160	28300	25500	2390	20900	20100	32800	25000	27600	**NG**
Lead	mg/kg (ppm)	16	13.2	40.3	21.9	18.7	1.48	10.1	11	16	44.8	12.2	**600**
Magnesium	mg/kg (ppm)	15600	26900	86100	15000	27800	128000	28300	59300	14200	44500	25700	**NG**
Manganese	mg/kg (ppm)	848	630	155	743	581	142	580	430	496	748	807	**NG**
Molybdenum	mg/kg (ppm)	0.32	0.54	1.7	0.55	0.49	0.24	0.8	1.08	0.44	0.42	0.25	**40**
Nickel	mg/kg (ppm)	48.2	35.4	19.1	38.1	34.6	2.21	24.2	27.4	46.1	32.8	36.6	**89**
Phosphorus	mg/kg (ppm)	542	610	132	954	537	56	578	398	511	450	516	**NG**
Potassium	mg/kg (ppm)	5850	4760	370	6480	4060	350	1530	2840	5430	4010	4160	**NG**
Selenium	mg/kg (ppm)	<0.20	<0.20	<0.20	0.47	0.25	<0.20	<0.20	0.36	<0.20	<0.20	0.21	**2.9**
Sodium	mg/kg (ppm)	719	148	59	626	279	61	493	344	580	327	397	**NG**
Silver	mg/kg (ppm)	0.13	0.12	0.1	0.14	0.12	<0.10	0.11	<0.10	0.15	0.12	0.11	**40**
Thallium	mg/kg (ppm)	0.429	0.3	<0.050	0.34	0.285	<0.050	0.232	0.214	0.405	0.258	0.33	**3.6**
Tin	mg/kg (ppm)	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	**300**
Vanadium	mg/kg (ppm)	86	78.1	9.55	72.8	65.6	5.14	40	43.9	76.9	59.2	66.7	**130**
Uranium	mg/kg (ppm)	3.54	0.999	0.263	1.61	1.3	0.236	1.86	1.26	1.79	0.79	2.62	**300**
Zinc	mg/kg (ppm)	113	80	335	123	90.3	6	60.1	72.5	84.1	142	80.5	**450**

Notes:

< - less than the method detection limit

BOLD exceeds applicable soil guideline

NG – not applicable/no guideline criteria established.

· mg/kg - concentration in milligrams per kilogram equivlanet to µg/g - micro gram per gram

1 As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . Criteria are based on CCME standards unless otherwise noted

See laboratory report for detection limits, testing protocols and QA/QC procedures.

See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Laboratory in Winnipeg.

TABLE 5: SOIL ANALYTICAL RESULTS - PAHs

Parameter	Units	Detection Limit	TH19-01 @ 0.8M	TH19-03 @ 0.8M	TH19-04 @ 0.8M	TH19-05 @ 0.8M	TH19-06 @ 0.8M	TH19-07 @ 0.8M	TH19-07 @ 1.5M	TH19-08 @ 0.8M	TH19-09 @ 0.8M	TH19-10 @ 0.8M	TH19-11 @ 1.5M	Assessment Criteria
Acenaphthene	mg/kg (ppm)	0.005	<0.0050	<0.0050	<0.0050	0.0077	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**96**
Acenaphthylene	mg/kg (ppm)	0.005	<0.0050	<0.0050	<0.0050	0.11	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.17**
Anthracene	mg/kg (ppm)	0.004	<0.0040	<0.0040	0.0041	0.0984	0.0098	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	**32**
Benzo(a)anthracene	mg/kg (ppm)	0.01	<0.010	<0.010	<0.10	0.506	0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**10**
Benzo(a)pyrene	mg/kg (ppm)	0.01	<0.010	<0.010	<0.10	0.376	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**72**
Benzo[b+j]fluoranthene	mg/kg (ppm)	0.01	<0.010	<0.010	0.12	0.81	0.038	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	**10**
Benzo(g,h,i)perylene	mg/kg (ppm)	0.01	<0.010	<0.010	0.13	0.302	0.021	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**9.6**
Benzo(k)fluoranthene	mg/kg (ppm)	0.01	<0.010	<0.010	<0.10	0.307	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**10**
Chrysene	mg/kg (ppm)	0.01	<0.010	<0.010	0.3	0.646	0.041	0.049	<0.010	<0.010	<0.010	<0.010	<0.010	**9.6**
Dibenzo(a,h)anthracene	mg/kg (ppm)	0.005	<0.0050	<0.0050	<0.050	0.0993	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**10**
Fluoranthene	mg/kg (ppm)	0.01	<0.010	<0.010	0.032	0.66	0.058	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**180**
Fluorene	mg/kg (ppm)	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**69**
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.01	<0.010	<0.010	<0.10	0.322	0.021	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**10**
2-Methylnaphthalene	mg/kg (ppm)	0.01	<0.010	<0.010	0.021	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**85**
Naphthalene	mg/kg (ppm)	0.01	<0.010	<0.010	0.014	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**22**
Phenanthrene	mg/kg (ppm)	0.01	<0.010	<0.010	0.02	0.071	0.032	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**50**
Pyrene	mg/kg (ppm)	0.01	<0.010	<0.010	0.091	0.85	0.057	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	**100**
B[a]P Total Potency Equivalent	mg/kg (ppm)	0.02	<0.020	<0.020	0.106	0.68	0.035	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	**5.3**

Notes:

< - less than the method detection limit

BOLD exceeds applicable soil guideline

NG – not applicable/no guideline criteria established.

· mg/kg - concentration in milligrams per kilogram equivlanet to µg/g - micro gram per gram

CCME EQG – Industrial land use guidelines as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updates to 2016). The B[a]P Total Potency Equivalent concentration is based on one in one hundred thousand (10-5) incremental risk of cance.

See laboratory report for detection limits, testing protocols and QA/QC procedures.

See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Laboratory in Winnipeg.

[1] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) .

TABLE 6: SOIL ANALYTICAL RESULTS - VOCs

Parameter	Units	TH19-01 @ 0.8M	TH19-03 @ 0.8M	TH19-04 @ 0.8M	TH19-05 @ 0.8M	TH19-06 @ 0.8M	TH19-07 @ 0.8M	TH19-07 @ 1.5M	TH19-09 @ 0.8M	TH19-11 @ 1.5M	Assessment Guidelines
Acetone	mg/kg (ppm)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**28**
Benzene	mg/kg (ppm)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**2.9**
Bromobenzene	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**NG**
Bromochloromethane	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**18**
Bromodichloromethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**18**
Bromoform	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**1.7**
Bromomethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.05**
n-Butylbenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
sec-Butylbenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
tert-Butylbenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
Carbon disulfide	mg/kg (ppm)	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**NG**
Carbon Tetrachloride	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
Chlorobenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**10**
Dibromochloromethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**13**
Chloroethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
Chloroform	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
Chloromethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
2-Chlorotoluene	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**NG**
4-Chlorotoluene	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**NG**
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
1,2-Dibromoethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.05**
Dibromomethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
1,2-Dichlorobenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**10**
1,3-Dichlorobenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**10**
1,4-Dichlorobenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**10**
Dichlorodifluoromethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**25**
1,1-dichloroethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
1,2-Dichloroethane	µg/g (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
1,1-dichloroethene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
cis-1,2-Dichloroethene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
trans-1,2-Dichloroethene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
Dichloromethane	mg/kg (ppm)	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	0.18	0.18	<0.10	**50**
1,2-Dichloropropane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
1,3-Dichloropropane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
2,2-Dichloropropane	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**NG**
1,1-Dichloropropene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
cis-1,3-Dichloropropene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.21**
trans-1,3-Dichloropropene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.21**
Ethyl benzene	mg/kg (ppm)	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	**6700**
Hexachlorobutadiene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.095**
Hexane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
2-Hexanone (Methyl butyl ketone)	mg/kg (ppm)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**NG**
Isopropylbenzene	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**NG**
4-Isopropyltoluene	mg/kg (ppm)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**NG**
MEK	mg/kg (ppm)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**88**
MIBK	mg/kg (ppm)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**210**
MTBE	mg/kg (ppm)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**3.2**
Styrene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.11**
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
Tetrachloroethene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
Toluene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.5**
1,2,3-Trichlorobenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**10**
1,2,4-Trichlorobenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**10**
1,1,1-Trichloroethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
1,1,2-Trichloroethane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**50**
Trichloroethene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.92**
Trichlorofluoromethane	mg/kg (ppm)	<0.050	<0.050	0.144	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**5.8**
1,2,3-Trichloropropane	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
1,2,4-Trimethylbenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
1,3,5-Trimethylbenzene	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**
Vinyl Chloride	mg/kg (ppm)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.25**
Xylenes (Total)	mg/kg (ppm)	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	**1600**

Notes:

- mg/kg - concentration in milligrams per kilogram)
- < - less than the method detection limit
- NG - No Guideline
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Environmental's Laboratory in Winnipeg.
- Guideline - CCME EQG commercial land use guidelines as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updates to 2018)

BOLD exceeds applicable soil guideline

[1] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR). See Table D-1

TABLE 7: SOIL ANALYTICAL RESULTS - PCBs

Parameter	Units	Detection Limit	TH19-01 @ 0.8M	TH19-03 @ 0.8M	TH19-04 @ 0.8M	TH19-05 @ 0.8M	TH19-06 @ 0.8M	TH19-07 @ 0.8M	TH19-07 @ 1.5M	TH19-09 @ 0.8M	Guideline
PCBs - Total	mg/kg (ppm)	0.005	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**33**

BOLD exceeds applicable soil guideline

TABLE 8: SOIL ANALYTICAL RESULTS - EXTRACTABLE ORGANIC HALIDES (EOX)

Parameter	Units	TH19-01 @ 0.8M	TH19-03 @ 0.8M	TH19-04 @ 0.8M	TH19-05 @ 0.8M	TH19-06 @ 0.8M	TH19-07 @ 0.8M	TH19-07 @ 1.5M	TH19-09	Guideline
Halogen, Total Organic (TOX)	mg/kg	ND	ND	ND	ND	7.1	ND	ND	ND	NG

BOLD exceeds applicable soil guideline

TABLE 9: GROUNDWATER MONITORING WELL DATA

Monitoring Well	Date	Ground Elevation	TOC Elevation	Total Depth	Depth to Water	Depth to Water	Ground Water Elevation	LNAPL Thickness	Well Headspace Vapours	Groundwater Headspace Vapours
	dd-mmm-yy	m	m	m btoc	m btoc	m bgl	m	mm	ppm_v	ppm_v
TH19-01	8-Jan-20	234.811	234.805	4.485	3.837	3.998	230.32	ND	<5	<5
TH19-03	20-Dec-19	235.61	235.604	4.49	1.677	1.837	231.114	ND	<5	<5
TH19-04	20-Dec-19	235.056	235.031	4.236	2.135	2.277	230.795	ND	<5	<5
TH19-07	20-Dec-19	234.706	234.669	3.614	2.222	2.384	231.055	ND	<5	<5
TH19-08	20-Dec-19	234.842	235.344	3.657	1.847	2.09	231.687	ND	<5	<5
TH19-10	20-Dec-19	234.792	234.786	4.476	2.574	2.748	230.31	ND	<5	<5

Notes:

- m - meters
- TOC - top of casing
- LNAPL - light non-aqueous phase liquids
- ORP - oxidation/reduction potential
- m btoc - meters below top of casing
- m bgl - meters below ground level
- mm - millimeters
- ppm_v - parts per million organic vapour
- --- - not measured
- ND - not detected
- NS - not surveyed
- NC - not calculated

TABLE 10: GROUNDWATER ANALYTICAL RESULTS - PHCs

Monitoring Well	Date (dd-mmm-yy)	Well Headspace Vapour Concentration (ppm_v)	Concentration (mg/L)							
			Benzene	Toluene	Ethylbenzene	Xylenes	PHC Fraction F1	PHC Fraction F2	PHC Fraction F3	PHC Fraction F4
TH19-01	8-Jan-20	<5	<0.00050	<0.00050	<0.00050	<0.00064	<0.10	<0.10	0.38	<0.25
TH19-03	20-Dec-19	<5	<0.00050	<0.00050	<0.00050	<0.00064	<0.10	<0.10	<0.25	<0.25
DUP1 (TH19-03)			<0.00050	0.00070	<0.00050	<0.00064	<0.10	<0.10	<0.25	<0.25
TH19-04	20-Dec-19	<5	<0.00050	<0.00050	<0.00050	<0.00064	<0.10	<0.10	1.26	0.66
TH19-07	20-Dec-19	<5	<0.00050	0.0012	<0.00050	<0.00064	<0.10	<0.10	0.98	0.83
TH19-08	20-Dec-19	<5	<0.00050	<0.00050	<0.00050	<0.00064	<0.10	<0.50	57.2	74
TH19-10	20-Dec-19	<5	<0.00050	<0.00050	<0.00050	<0.00064	<0.10	<0.10	<0.25	<0.25
Applicable Industrial Groundwater Guidelines (non-potable) [1]			**19**	**240**	**150**	**74**	**9.9**	**3.1**	**NG**	**NG**
Tap (Water Well)	8-Jan-20	<5	<0.00050	<0.00050	<0.00050	<0.00064	<0.10	<0.10	<0.25	<0.25
Potable Groundwater Guidelines (for comparison to Tap (Water Well))			**0.005**	**0.06**	**0.073**	**0.09**	**NG**	**NG**	**NG**	**NG**

Notes:

- mg/L - concentration in milligrams per liter
- ppm_v - parts per million organic vapour
- PHC Fraction F1 - volatile petroleum hydrocarbons ($C_6 – C_{10}$), less BTEX
- PHC Fraction F2 - extractable petroleum hydrocarbons ($C_{10} – C_{16}$)
- PHC Fraction F3 - extractable petroleum hydrocarbons ($C_{16} – C_{34}$)
- PHC Fraction F4 - extractable petroleum hydrocarbons ($C_{34} – C_{50}$)
- < - less than the analytical detection limit
- NG - no guideline
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Canada Ltd.

BOLD exceeds the referenced guidelines

[1] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . The assessment guidelines are based on Health Canada Guidelines for Canadian Drinking Water Quality and Alberta Environment and Parks Tier 2 Groundwater Remediation Guidelines (2019), as outlined in table D-1. See Appendix D.

TABLE 11: GROUNDWATER ANALYTICAL RESULTS - METALS

Parameter	TH19-01	TH19-03	DUP1 (TH19-03)	TH19-04	TH19-07	TH19-08	TH19-10	Assesment Criteria (non-potable)	Tap (Water Well)	Potable Criteria (Water Well)
Antimony	0.00026	<0.010	0.00051	<0.0010	<0.0010	<0.0010	0.0016	**NG**	<0.00010	**NG**
Aluminum	0.102	395	0.34	8.42	28.2	10.9	0.302	**NG**	<0.0030	**NG**
Arsenic	0.00093	0.289	0.00109	0.0086	0.0246	0.0076	0.0011	**NG**	0.00017	**NG**
Barium	0.0315	6.79	0.0436	0.198	0.398	0.187	0.05	**NG**	0.0181	**1**
Beryllium	<0.00010	0.021	<0.00010	<0.0010	0.0017	<0.0010	<0.0010	**NG**	<0.00010	**NG**
Cadmium	0.000196	0.0136	0.000133	0.000337	0.00117	0.000406	0.0014	**NG**	0.0000117	**0.005**
Calcium	514	9510	342	361	859	469	415	**NG**	42.9	**NG**
Chromium	0.00078	0.822	0.00203	0.0163	0.0598	0.0228	0.0015	**NG**	<0.00010	**0.05**
Cobalt	0.00552	0.36	0.00053	0.0228	0.0227	0.0172	0.0024	**NG**	0.00047	**NG**
Copper	0.00618	0.944	0.00786	0.0318	0.0846	0.0414	0.0312	**NG**	0.0169	**1**
Iron	0.187	631	0.559	12.6	58.6	16.6	0.76	**NG**	**2.26**	**0.3**
Lead	0.000404	0.409	0.0011	0.0184	0.0406	0.0286	0.0207	**NG**	0.00279	**0.01**
Magnesium	407	5210	363	282	551	307	314	**NG**	46	**NG**
Manganese	3.56	28.9	0.1	4.1	2.31	2.38	1.17	**NG**	**0.0552**	**0.05**
Molybdenum	0.00339	0.0094	0.00538	0.00371	0.00379	0.00558	0.00296	**NG**	0.000607	**NG**
Nickel	0.0208	1.02	0.0116	0.0409	0.0811	0.0401	0.0302	**NG**	0.00103	**NG**
Phosphorus	0.091	30.6	0.098	0.33	1.86	0.35	<0.30	**NG**	<0.030	**NG**
Potassium	11.4	96.2	7.24	7.21	10.8	7.63	7.85	**NG**	3.7	**NG**
Selenium	0.00214	<0.0050	0.00918	<0.00050	0.00078	<0.00050	<0.00050	**NG**	<0.000050	**NG**
Sodium	291	602	169	188	260	229	259	**NG**	25.7	**NG**
Silver	0.000019	0.0046	0.000023	0.00012	0.00035	0.00018	<0.00010	**NG**	<0.000010	**NG**
Thallium	0.00002	0.0087	0.000028	0.00016	0.00062	0.0002	<0.00010	**NG**	<0.000010	**NG**
Tin	0.00841	<0.010	0.00166	<0.0010	0.0017	0.0016	0.0031	**NG**	<0.00010	**NG**
Vanadium	0.00158	1.2	0.00191	0.0271	0.0946	0.0365	<0.0050	**NG**	<0.00050	**NG**
Uranium	0.11	0.168	0.145	0.0398	0.0977	0.0618	0.0969	**NG**	0.00103	**0.02**
Zinc	0.0217	1.7	0.0187	0.167	0.247	0.162	0.522	**NG**	0.211	**5**

Notes:

BOLD exceeds the referenced guidelines

< - less than the method detection limit

NG – not applicable/no guideline criteria established.

· mg/l - concentration in milligrams per litre

See laboratory report for detection limits, testing protocols and QA/QC procedures.

See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Laboratory in Winnipeg.

1 As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . The assessment guidelines are based on Alberta Environment and Parks Tier 2 Groundwater Remediation Guidelines (2019), as outlined in table D-1. See Appendix D.

2 Potable Comparison Criteria based on Health Canada Guidelines for Canadian Drinking Water Quality (2019)

wood.

TABLE 12 : GROUNDWATER ANALYTICAL RESULTS - PAHs

Parameter	Units	Detection Limit	TH19-01	TH19-03	DUP1 (TH19-03)	TH19-04	TH19-07	TH19-08	TH19-10	Assessment Criteria [1]	Tap (Water Well)	Potable Criteria[2] (Water Well)
Acenaphthene	mg/kg (ppm)	0.005	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	NG	<0.000020	NG
Acenaphthylene	mg/kg (ppm)	0.005	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	NG	<0.000020	NG
Anthracene	mg/kg (ppm)	0.004	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	<0.000010	0.32	<0.000010	NG
Benzo(a)anthracene	mg/kg (ppm)	0.01	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	<0.000010	NG	<0.000010	NG
Benzo(a)pyrene	mg/kg (ppm)	0.01	<0.0000050	<0.0000050	<0.0000050	0.0000084	0.0000066	<0.000015	<0.0000050	0.0066	<0.0000050	0.00004
Benzo[b+j]fluoranthene	mg/kg (ppm)	0.01	<0.000010	<0.000010	<0.000010	0.000014	<0.000010	<0.000030	<0.000010	NG	<0.000010	NG
Benzo(g,h,i)perylene	mg/kg (ppm)	0.01	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	NG	<0.000020	NG
Benzo(k)fluoranthene	mg/kg (ppm)	0.01	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	<0.000010	NG	<0.000010	NG
Chrysene	mg/kg (ppm)	0.01	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	NG	<0.000020	NG
Dibenzo(a,h)anthracene	mg/kg (ppm)	0.005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000015	<0.0000050	10	<0.0000050	NG
Fluoranthene	mg/kg (ppm)	0.01	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	0.86	<0.000020	NG
Fluorene	mg/kg (ppm)	0.01	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	NG	<0.000020	NG
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.01	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000060	<0.000010	NG	<0.000010	NG
2-Methylnaphthalene	mg/kg (ppm)	0.01	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000060	<0.000020	NG	<0.000020	NG
Naphthalene	mg/kg (ppm)	0.01	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00015	<0.000050	NG	<0.000050	NG
Phenanthrene	mg/kg (ppm)	0.01	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00015	<0.000050	NG	<0.000050	NG
Pyrene	mg/kg (ppm)	0.01	<0.000010	<0.000010	<0.000010	0.000018	0.000022	<0.000030	<0.000010	NG	<0.000010	NG
B[a]P Total Potency Equivalent	mg/kg (ppm)	0.02	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030	NG	<0.000030	0.00004

Notes:

- < - less than the method detection limit
- NG – not applicable/no guideline criteria established.
- mg/kg - concentration in milligrams per kilogram equivlanet to µg/g - micro gram per gram
- CCME EQG – commercial land use guidelines as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updates to 2016). The B[a]P Total Potency Equivalent concentration is based on one in one hundred thousand (10-5) incremental risk of cancer.
- See laboratory report for detection limits, testing protocols and QA/QC procedures.

BOLD exceeds the referenced guidelines

See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Laboratory in Winnipeg.

1 As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . The assessment guidelines are based on "Alberta Environment and Parks Tier 2 Groundwater Remediation Guidelines (2019), as outline in table D-1. See Appendix D.

2 Potable Comparison Criteria based on Health Canada Guidelines for Canadian Drinking Water Quality (2019)

TABLE 13: GROUNDWATER ANALYTICAL RESULTS - VOCs

Parameter	Units	TH19-01	TH19-03	DUP 1 (TH19-03)	TH19-04	TH19-07	TH19-08	TH19-10	Assessment Criteria [1]	Tap (Water Well)	Potable Criteria [2] (Water Well)
Acetone	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**NG**	<0.050	**NG**
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
Bromobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Bromochloromethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**85**	<0.0010	**NG**
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
Bromoform	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Bromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
n-Butylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
sec-Butylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
tert-Butylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Carbon disulfide	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**NG**	<0.0050	**NG**
Carbon Tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**0.08**	<0.00050	**0.002**
Chlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**2.2**	<0.0010	**NG**
Dibromochloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**250**	<0.00050	**NG**
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**3.5**	<0.00050	**NG**
Chloromethane	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**NG**	<0.0050	**NG**
2-Chlorotoluene	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	**NG**	<0.020	**NG**
4-Chlorotoluene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,2-Dibromo-3-chloropropane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,2-Dibromoethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Dibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,2-Dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**9.6**	<0.00050	**0.005**
1,3-Dichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**9.6**	<0.0010	**NG**
1,4-Dichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**32**	<0.0010	**0.005**
Dichlorodifluoromethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**4.4**	<0.0010	**NG**
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**44**	<0.00050	**NG**
1,2-Dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**1.2**	<0.00050	**0.005**
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**4.5**	<0.00050	**0.014**
cis-1,2-Dichloroethene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
trans-1,2-Dichloroethene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Dichloromethane	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**410**	<0.0050	**0.05**
1,2-Dichloropropane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,3-Dichloropropane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
2,2-Dichloropropane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,1-Dichloropropene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
cis-1,3-Dichloropropene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	**NG**	<0.0010	**NG**
trans-1,3-Dichloropropene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Ethyl benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
Hexachlorobutadiene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.22**	<0.0010	**NG**
Hexane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.52**	<0.0010	**NG**
2-Hexanone (Methyl butyl ketone)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	**NG**	<0.020	**NG**
Isopropylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
4-Isopropyltoluene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
MEK	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	**NG**	<0.020	**NG**
MIBK	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	**NG**	<0.020	**NG**
MTBE	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**40**	<0.00050	**0.015**
Styrene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0015**	<0.0010	**NG**
1,1,1,2-Tetrachloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
1,1,2,2-Tetrachloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**1.8**	<0.00050	**0.01**
Toluene	mg/L	<0.00050	<0.00050	0.0007	<0.00050	0.00115	<0.00050	<0.00050	**NG**	<0.00050	**NG**
1,2,3-Trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**6.9**	<0.0010	**NG**
1,2,4-Trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**6.1**	<0.0010	**NG**
1,1,1-Trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
1,1,2-Trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**NG**	<0.00050	**NG**
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**2.8**	<0.00050	**0.005**
Trichlorofluoromethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**2.5**	<0.0010	**NG**
1,2,3-Trichloropropane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,2,4-Trimethylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
1,3,5-Trimethylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**NG**	<0.0010	**NG**
Vinyl Chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	**0.12**	<0.00050	**0.002**
Xylenes (Total)	mg/L	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064	**NG**	<0.00064	**NG**

Notes:

BOLD exceeds the referenced guidelines

- mg/L - concentration in milligrams per liter
- < - less than the method detection limit
- NG - No Guideline
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by ALS Environmental's Laboratory in Winnipeg.
- Guideline - Refer to Appendix D for critera source

1 As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . The assessment guidelines are based on Alberta Environment and Parks Tier 2 Groundwater Remediation Guidelines (2019), as outlined in table D-1. See Appendix D.

2 Potable Comparison Criteria based on Health Canada Guidelines for Canadian Drinking Water Quality (2019)

TABLE 14: GROUNDWATER ANALYTICAL RESULTS - Dioxins and Furans

Parameter	Units	Detection Limit	Tap (Water Well)	MOE Assesment Guideline[2]
2,3,7,8-TCDD	pg/L	0.59	<0.46	**NG**
1,2,3,7,8-PeCDD	pg/L	0.33	<0.26	**NG**
1,2,3,4,7,8-HxCDD	pg/L	0.42	<0.34	**NG**
1,2,3,6,7,8-HxCDD	pg/L	0.42	<0.34	**NG**
1,2,3,7,8,9-HxCDD	pg/L	0.42	<0.34	**NG**
1,2,3,4,6,7,8-HpCDD	pg/L	0.41	0.73	**NG**
OCDD	pg/L	0.8	3.11	**NG**
Total-TCDD	pg/L	0.59	<0.46	**NG**
Total TCDD # Homologues	-	---	0	**NG**
Total-PeCDD	pg/L	0.33	<0.26	**NG**
Total PeCDD # Homologues	-	---	0	**NG**
Total-HxCDD	pg/L	0.42	<0.34	**NG**
Total HxCDD # Homologues	-	---	0	**NG**
Total-HpCDD	pg/L	0.41	<0.40	**NG**
Total HpCDD # Homologues	-	---	0	**NG**
2,3,7,8-TCDF	pg/L	0.46	<0.32	**NG**
1,2,3,7,8-PeCDF	pg/L	0.36	0.34	**NG**
2,3,4,7,8-PeCDF	pg/L	0.3	<0.18	**NG**
1,2,3,4,7,8-HxCDF	pg/L	0.32	<0.19	**NG**
1,2,3,6,7,8-HxCDF	pg/L	0.33	<0.20	**NG**
1,2,3,7,8,9-HxCDF	pg/L	0.42	0.56	**NG**
2,3,4,6,7,8-HxCDF	pg/L	0.32	<0.19	**NG**
1,2,3,4,6,7,8-HpCDF	pg/L	0.29	<0.26	**NG**
1,2,3,4,7,8,9-HpCDF	pg/L	0.32	<0.31	**NG**
OCDF	pg/L	0.55	1.19	**NG**
Total-TCDF	pg/L	0.46	<0.32	**NG**
Total TCDF # Homologues	-	---	0	**NG**
Total-PeCDF	pg/L	0.36	0.34	**NG**
Total PeCDF # Homologues	-	---	1	**NG**
Total-HxCDF	pg/L	0.42	0.56	**NG**
Total HxCDF # Homologues	-	---	1	**NG**
Total-HpCDF	pg/L	0.32	<0.31	**NG**
Total HpCDF # Homologues	-	---	0	**NG**
Lower Bound PCDD/F TEQ (WHO 2005)	pg/L	---	0.0675	**NG**
Mid Point PCDD/F TEQ (WHO 2005)	pg/L	---	0.561	**NG**
Upper Bound PCDD/F TEQ (WHO 2005)	pg/L	---	1.05	**15** [1]

Notes:

< - less than the method detection limit

NG – not applicable/no guideline criteria established.

· mg/kg - concentration in milligrams per kilogram equivlanet to µg/g - micro gram per gram

[1] Standards Selected from the Ontario Ministry of Environment's Full Depth Generic Site Conditions Standards in a Potable Groundwater Condition. Table 3. 2011.

TABLE 15: GROUNDWATER ANALYTICAL RESULTS - TOTAL ORGANIC HALIDES (TOX)

Parameter	Units	TH19-01	TH19-03	DUP1 (TH19-03)	TH19-04	TH19-07	TH19-08	TH19-10	Tap (Water Well)	Guideline
Halogen, Total Organic (TOX)	µg/l	ND	51.0	54.6	58.4	77.8	ND	82.4	ND	NG

BOLD exceeds applicable soil guideline

Appendix A

Site Photographs

Photograph 1: Monitoring well TH19-11 inside building on site.

Photograph 2: Monitoring well TH19-03 in southeast of site .

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MADE BY: AC	DATE: Feb. 2019	PROJECT NO.: WX18979 PLATE 1

Photograph 3: Monitoring well TH19-04 on south part of site..

Photograph 4: Monitoring well TH19-07 on southwest part of site.

wood.	Environment & Infrastructure Solutions 440 Dovercourt Drive Winnipeg MB, R3Y 1N4 www.woodplc.com	**Phase II Environmental Site Assessment** **999 Redonda Street** **RM of Springfield** **Oakbank, Manitoba**
MADE BY: AC	DATE: Feb. 2019	PROJECT NO.: WX18979 PLATE 2

Photograph 5: Monitoring well TH19-08 on west side of site.

Photograph 6: Monitoring well TH19-10 on northwest side of site.

wood.	Environment & Infrastructure Solutions 440 Dovercourt Drive Winnipeg MB, R3Y 1N4 www.woodplc.com	**Phase II Environmental Site Assessment** **999 Redonda Street** **RM of Springfield** **Oakbank, Manitoba**
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Appendix B

Test Hole Logs

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-01**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION TH19-01	COMMENTS	DEPTH (m)
0		OL	ORGANIC (GRASS) - frozen						0
			CLAY - medium plastic, damp, firm, black with brown						
1		CI			1				1
		ML	SILT - low plastic, moist, soft, tan		2				
			CLAY - medium plastic, damp to moist, firm, brown						
2					3				2
			- below 2.4m, occasional mica						
3		CI			4				3
			- below 3.7m, occasional oxides		5				
4					6				4
			END OF HOLE AT 4.6m BELOW EXISTING GRADE						
5			Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.						5
6									6
7									7
8									8
9									9
10									

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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Figure No.	Sheet 1 of 1

WX18979 - PHASE I AND II ESA 999 REDONDA TERVITA.GPJ 20/01/28 11:57 AM (WPG - ENVIRO LOG 1)

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-02**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	POCKET PENETROMETER (kPa) 100 200 300 400 / COMBUSTIBLE VAPOUR (ppmv) 2000 4000 6000 8000	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0			OL	ORGANIC (GRASS) - frozen					0
				CLAY - medium plastic, damp, firm, black, some roots		1			
			CI						
1				SILT - low plastic, damp, soft, tan					1
			ML			2			
				CLAY - medium plastic, damp, firm, light brown, occasional mica					
2						3			2
3			CI			4			3
						5			
4						6			4
				END OF HOLE AT 4.6m BELOW EXISTING GRADE					
5				Notes:					5
				- No sloughing was observed during drilling.					
				- No seepage was observed during drilling.					
				- Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.					
6				- Test hole was backfilled with auger cuttings and bentonite.					6
7									7
8									8
9									9
10									

WX18979 - PHASE I AND II ESA 999 REDONDA TERVITA.GPJ 20/01/28 11:57 AM (WPG - ENVIRO LOG 1)

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Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-03**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: N5532079 E644909	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION TH19-03	COMMENTS	DEPTH (m)
0		OL	ORGANIC - grass, trace sand, frozen						0
			CLAY - high plastic, damp, firm, brown to tan mottled, trace sand, some oxides						
1		CH	- below 0.7m, brown, no sand, mica		1				1
					2				
			CLAY - silty, medium plastic, moist, soft, tan, frequent mica						
2			- below 1.9m, some silt, medium plastic, moist, soft, dark tan		3				2
3		CI	- below 3.0m, medium plastic, moist, soft, brown, some mica		4				3
			- below 3.7m, frequent mica		5				
4					6				4
			END OF HOLE AT 4.6m BELOW EXISTING GRADE						
5			Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.						5
6									6
7									7
8									8
9									9
10									

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-04**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION TH19-04	COMMENTS	DEPTH (m)
0		GP	GRAVEL FILL - organic matter, poorly graded, moist, firm, light brown		1				0
1		CH	CLAY - high plastic, damp, firm, brown, some sand, some mica		2				1
2		CI	CLAY - medium plastic, moist to wet, soft, light brown - below 2.3m, soft to firm with occasional mica		3				2
3			- below 3.0m, damp with frequent mica		4				3
4					5				4
5					6				5
6			END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.						6
7									7
8									8
9									9
10									

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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LOGGED BY: AC	COMPLETION DEPTH: 4.6 m
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Figure No.	Sheet 1 of 1

WX18979 - PHASE I AND II ESA 999 REDONDA TERVITA.GPJ 20/01/28 11:58 AM (WPG - ENVIRO LOG 1)

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-05**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	POCKET PENETROMETER (kPa) 100 200 300 400 / COMBUSTIBLE VAPOUR (ppmv) 2000 4000 6000 8000	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0			OL	ORGANIC (GRASS) - 10mm thick CLAY - medium plastic, damp, firm, black, occasional roots, occasional debris (cinder)		1			0
1						2			1
2				- below 1.7m, damp to moist, soft to firm, tan to light brown		3			2
3			CI	- below 2.3m, occasional mica - below 3.0m, occasional oxides		4			3
4						5			4
5						6			5
6				END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling. - Test hole was backfilled with auger cuttings and bentonite.					6
7									7
8									8
9									9
10									

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LOGGED BY: AC	COMPLETION DEPTH: 4.6 m
REVIEWED BY: JH	COMPLETION DATE: December 16, 2019
Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-06**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	POCKET PENETROMETER (kPa) 100 200 300 400 / COMBUSTIBLE VAPOUR (ppmv) 2000 4000 6000 8000	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0			OL	ORGANIC (GRASS) - frozen					0
			ML	SILT - clayey, medium plastic, damp, soft to firm, tan with brown, debris (plastic) and organic debris (wood)		1			
1				CLAY - medium plastic, damp, firm, brown, occasional gravel		2			1
2						3			2
				- below 2.3m, occasional oxides, brown and black mottling					
3			CI			4			3
4						5			4
						6			
5				END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling. - Test hole was backfilled with auger cuttings and bentonite.					5
6									6
7									7
8									8
9									9
10									

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LOGGED BY: AC	COMPLETION DEPTH: 4.6 m
REVIEWED BY: JH	COMPLETION DATE: December 16, 2019
Figure No.	Sheet 1 of 1

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PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-07**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION TH19-07	COMMENTS	DEPTH (m)
0		GP	GRAVEL FILL - poorly graded, moist to wet, dense, grey		1				0
1		CI	CLAY - silty, medium plastic, moist, soft, light brown to tan		2				1
2		CH	CLAY - high plastic, damp, firm, brown		3				2
3					4				3
4					5				4
					6				
5			END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.						5
6									6
7									7
8									8
9									9
10									

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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REVIEWED BY: JH	COMPLETION DATE: December 3, 2019
Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-08**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION TH19-08	COMMENTS	DEPTH (m)
0		GP	GRAVEL FILL - organic matter, poorly graded, moist, firm, light brown						0
1			CLAY - high plastic, damp, soft to firm, brown		1				1
2		CH	- below 1.6m, medium plastic, moist, soft, light brown		2				2
3			- below 2.3m, damp to moist, firm, high plastic, brown, frequent mica		3				3
4		CI	CLAY - medium plastic, damp, soft, light brown, frequent mica		4				4
5					5				5
6					6				6
7			END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.						7
8									8
9									9
10									

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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LOGGED BY: AC	COMPLETION DEPTH: 4.6 m
REVIEWED BY: JH	COMPLETION DATE: December 3, 2019
Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-09**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	POCKET PENETROMETER (kPa) 100 200 300 400 / COMBUSTIBLE VAPOUR (ppmv) 2000 4000 6000 8000	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	▲		OL	ORGANIC (GRASS) - frozen CLAY - medium plastic, damp, firm, black					0
1	▲			- below 0.8m, damp to moist, soft to firm, brown with some black		1			1
2	▲		CI	- below 1.5m, mica		2			2
3	▲			- below 3.0m, some oxides		3 4			3
4	▲			END OF HOLE AT 3.7m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 3.7m below grade with no accumulation of water prior to backfilling. - Test hole was backfilled with auger cuttings and bentonite.		5			4
5									5
6									6
7									7
8									8
9									9
10									

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LOGGED BY: AC	COMPLETION DEPTH: 3.7 m
REVIEWED BY: JH	COMPLETION DATE: December 16, 2019
Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-10**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION TH19-10	COMMENTS	DEPTH (m)
0		GP	GRAVEL FILL - organic matter, poorly graded, damp, firm, black, trace sand		1				0
1		CH	CLAY - trace sand, high plastic, damp, light brown with black, some oxides, some mica						1
2			CLAY - silty, medium plastic, damp to moist, soft to firm, light brown to tan		2				2
			- below 2.3m, damp to moist, light brown		3				
3		CI	- below 3.0m, damp		4				3
			- below 3.7m, frequent oxides		5				
4					6				4
5			END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling.						5
6									6
7									7
8									8
9									9
10									

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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LOGGED BY: AC	COMPLETION DEPTH: 4.6 m
REVIEWED BY: JH	COMPLETION DATE: December 3, 2019
Figure No.	Sheet 1 of 1

PROJECT: Phase II Environmental Site Assessment	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: **TH19-11**
CLIENT: Tervita Corporation		PROJECT No: WX18979
LOCATION: 999 Redonda St, Oakbank, MB	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0		GP	GRAVEL FILL - organic matter, poorly graded, moist, firm, light brown		1			0
1			CLAY - high plastic, damp, firm, black, trace gravel		2			1
2		CH	- below 1.5m, high plastic, damp, firm, dark brown, occasional mica		3			2
3			- below 2.6m, frequent mica		4			3
4		CI	CLAY - medium plastic, moist, firm, brown, frequent mica		5			4
5			END OF HOLE AT 4.6m BELOW EXISTING GRADE Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 4.6m below grade with no accumulation of water prior to backfilling. - Test hole was backfilled with auger cuttings and bentonite.		6			5
6								6
7								7
8								8
9								9
10								

POCKET PENETROMETER (kPa) ■ 100 200 300 400

▲ COMBUSTIBLE VAPOUR (ppmv) ▲ 2000 4000 6000 8000

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LOGGED BY: AC	COMPLETION DEPTH: 4.6 m
REVIEWED BY: JH	COMPLETION DATE: December 20, 2019
Figure No.	Sheet 1 of 1

WX18979 - PHASE I AND II ESA 999 REDONDA TERVITA.GPJ 20/01/28 11:58 AM (WPG - ENVIRO LOG 1)

Appendix C

Water Wells Records

Well Search

Site – NE16-11-4E1

Quarter sections within 500 m of Site:

NW ¼ 15-11-4E1
SW ¼ 15-11-4E1
SE ¼ 16-11-4E1

Location: NE16-11-4E

Well_PID: 111325

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN TEST WELL #1

Well Use: TEST WELL

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 1998 May 27

WELL LOG

From (ft.)	To (ft.)	Log
0	42.0	CLAY
42.0	50.0	TILL
50.0	51.0	LIMESTONE RUBBLE
51.0	65.0	SOFT LIMESTONE

65.0 80.0 SOFT LIMESTONE, LOOSE

80.0 102.0 LIMESTONE RUBBLE

102.0 118.0 LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	52.5	CASING	5.00				GALVANIZED
52.5	118.0	OPEN HOLE	4.50				
0	40.0	CASING GROUT					CEMENT
40.0	118.0	CASING GROUT					BENTONITE

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 1998 May 27

Pumping Rate: 30.000 Imp. gallons/minute

Water level before pumping: 30.4 ft. below ground

Pumping level at end of test: 47.1 ft. below ground

Test duration: hours, 10 minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, S SIDE OF PROPERTY, HOLE ABANDONED

Location: NE16-11-4E

Well_PID: 111328

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN TEST WELL #2

Well Use: TEST WELL

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 1998 May 27

WELL LOG

From (ft.)	To (ft.)	Log
0	36.0	CLAY
36.0	39.0	TILL
39.0	50.0	WEATHERED LIMESTONE
50.0	118.0	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	52.0	CASING	5.00				GALVANIZED
52.0	118.0	OPEN HOLE	4.50				
0	40.0	CASING GROUT					BENTONITE
40.0	118.0	CASING GROUT					

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 1998 May 27

Pumping Rate: 10.000 Imp. gallons/minute

Water level before pumping: ?? ft. below ground

Pumping level at end of test: ?? ft. below ground

Test duration: ??? hours, ?? minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, NW OF RETURN TEST WELL #1, ABANDONED

Location: NE16-11-4E

Well_PID: 111327

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN TEST WELL #3

Well Use: TEST WELL

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 1998 Jun 09

WELL LOG

From (ft.)	To (ft.)	Log
0	43.0	CLAY
43.0	49.0	TILL
49.0	54.0	SOFT LIMESTONE
54.0	122.0	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	51.0	CASING	5.00				GALVANIZED
51.0	122.0	OPEN HOLE	4.50				
0	40.0	CASING GROUT					BENTONITE
40.0	122.0	CASING GROUT					

Top of Casing: 1.000 ft. above ground

PUMPING TEST

Date: 1998 Jun 09
Pumping Rate: 10.000 Imp. gallons/minute
Water level before pumping: ?? ft. below ground
Pumping level at end of test: ?? ft. below ground
Test duration: ??? hours, ?? minutes
Water temperature: ?? degrees F

REMARKS

999 REDONDA, NE OF RETURN TEST WELL #1, HOLE ABANDONED

Location: NE16-11-4E

Well_PID: 111329
Owner: X-POTENTIAL
Driller: Paul Slusarchuk Well Drilling LTd.
Well Name: RETURN TEST WELL #4
Well Use: TEST WELL
Water Use:
UTMX: 644608.1110
UTMY: 5532407.76
Accuracy XY:
UTMZ:
Accuracy Z:
Date Completed: 1998 Jun 09

WELL LOG

From (ft.)	To (ft.)	Log
0	37.0	CLAY
37.0	45.0	SILTY TILL
45.0	49.0	TILL WITH RUBBLE
49.0	145.0	LIMESTONE

WELL CONSTRUCTION

From	To	Casing	Inside	Outside	Slot	Type	Material

(ft.)	(ft.)	Type	Dia.(in)	Dia.(in)	Size(in)
0	49.0	CASING		5.50	GALVANIZED
49.0	145.0	OPEN HOLE	4.90		
0	4.0	CASING GROUT			BENTONITE
4.0	40.0	CASING GROUT			CEMENT

Top of Casing:

PUMPING TEST

Date: 1998 Jun 09

Pumping Rate: 85.000 Imp. gallons/minute

Water level before pumping: 31.8 ft. below ground

Pumping level at end of test: 44.0 ft. below ground

Test duration: hours, 10 minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, W SIDE OF PROPERTY, CASING LEFT IN HOLE

Location: NE16-11-4E

Well_PID: 111330

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN WELL #5

Well Use: RECHARGE

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z: UNKNOWN

Date Completed: 1998 Jun 10

WELL LOG

From (ft.)	To (ft.)	Log
0	38.0	CLAY
38.0	45.0	TILL
45.0	49.0	LIMESTONE RUBBLE
49.0	125.0	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	50.0	CASING	5.00				GALVANIZED
50.0	125.0	OPEN HOLE	4.00				
5.0	35.0	CASING GROUT					CEMENT
35.0	45.0	CASING GROUT					BENTONITE

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 1998 Jun 10

Pumping Rate: 85.000 Imp. gallons/minute

Water level before pumping: 30.4 ft. below ground

Pumping level at end of test: 31.0 ft. below ground

Test duration: 1 hours, 15 minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, N OF RETURN TEST WELL #4, PUMP TEST DATA FILE

Location: NE16-11-4E

Well_PID: 111331

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN WELL #6

Well Use: RECHARGE

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 1998 Jul 09

WELL LOG

From (ft.)	To (ft.)	Log
0	36.0	CLAY
36.0	47.0	TILL AND BOULDERS

47.0 49.0 LIMESTONE RUBBLE

49.0 51.0 SOFT LIMESTONE

51.0 148.0 LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	51.0	CASING	6.50			STEEL	
51.0	148.0	OPEN HOLE		6.50			
0	40.0	CASING GROUT				CEMENT	
40.0	51.0	CASING GROUT				BENTONITE	

Top of Casing: 1.000 ft. above ground

PUMPING TEST

Date: 1998 Jul 28

Pumping Rate: 330.000 Imp. gallons/minute

Water level before pumping: 31.4 ft. below ground

Pumping level at end of test: 37.4 ft. below ground

Test duration: 6 hours, minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, N OF RETURN WELL #5, PUMP TEST DATA FILE

Location: NE16-11-4E

Well_PID: 111332

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN WELL #7

Well Use: RECHARGE

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 1998 Jul 10

WELL LOG

From (ft.)	To (ft.)	Log
0	38.0	CLAY
38.0	45.0	TILL
45.0	48.0	LIMESTONE RUBBLE AND TILL
48.0	49.0	LIMESTONE
49.0	51.0	SOFT LIMESTONE RUBBLE
51.0	148.0	LIMESTONE, MAIN FRACTURES 59-60 FEET, SMALLER FRACTURE AT 73 FEET

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	51.5	CASING	6.50				STEEL
51.5	148.0	OPEN HOLE	6.30				

0 40.0 CASING GROUT CEMENT

40.0 50.0 CASING GROUT BENTONITE

Top of Casing: 1.502 ft. above ground

PUMPING TEST

Date: 1998 Jul 30

Pumping Rate: 255.000 Imp. gallons/minute

Water level before pumping: 30.6 ft. below ground

Pumping level at end of test: 41.0 ft. below ground

Test duration: 4 hours, minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, NW OF RETURN WELL #5, PUMP TEST DATA FILE

Location: NE16-11-4E

Well_PID: 110162

Owner: X POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: RETURN WELL #8

Well Use: RECHARGE

Water Use: Industrial

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z: UNKNOWN

Date Completed: 1998 Aug 06

WELL LOG

From (ft.)	To (ft.)	Log
0	36.0	CLAY
36.0	47.0	TILL
47.0	50.0	LIMESTONE RUBBLE
50.0	148.0	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	51.0	CASING	7.00			STEEL	
51.0	148.0	OPEN HOLE	6.30				
0	45.0	CASING GROUT				CEMENT	
45.0	51.0	CASING GROUT				BENTONITE	

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 1998 Aug 12

Pumping Rate: 360.000 Imp. gallons/minute

Water level before pumping: 33.7 ft. below ground

Pumping level at end of test: 40.2 ft. below ground

Test duration: 4 hours, minutes

Water temperature: ?? degrees F

REMARKS

99 REDONDA, FRACTURE START AT 52-56 FT

Location: NE16-11-4E

Well_PID: 77062
Owner: X-POTENTIAL
Driller: Paul Slusarchuk Well Drilling LTd.
Well Name: SOUTH WELL
Well Use: PRODUCTION
Water Use: Domestic
UTMX: 644608.1110
UTMY: 5532407.76
Accuracy XY: UNKNOWN
UTMZ:
Accuracy Z: UNKNOWN
Date Completed: 1993 Sep 27

WELL LOG

From (ft.)	To (ft.)	Log
0	2.0	GRAVEL FILL
2.0	40.0	CLAY
40.0	48.0	SILTY TILL
48.0	52.0	RUBBLE LIMESTONE
52.0	119.9	LIMESTONE

119.9	129.9	CLAY, RUBBLE LIMESTONE AND SOME SAND
129.9	145.9	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	54.5	casing	6.50			INSERT	PVC
54.5	145.9	open hole	6.00				
0	0	casing grout					CEMENT

Top of Casing: 1.000 ft. above ground

PUMPING TEST

Date: 1993 Sep 27
Pumping Rate: 182.995 Imp. gallons/minute
Water level before pumping: 35.7 ft. below ground
Pumping level at end of test: 37.5 ft. below ground
Test duration: 21 hours, 30 minutes
Water temperature: ?? degrees F

REMARKS

999 REDONDA, PUMPED WITH AIR, WATER RIGHTS FILE, PREVIOUS OWNER-GENERAL SCRAP LTD

Location: NE16-11-4E

Well_PID: 119785

Owner: UMA ENGINEERING

Driller: Friesen Drillers Ltd.

Well Name:

Well Use: OBSERVATION

Water Use:

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 2001 Jan 22

WELL LOG

From (ft.)	To (ft.)	Log
0	32.0	CLAY
32.0	44.0	TILL
44.0	53.0	RUBBLE - SOFT LIMESTONE
53.0	65.0	HARD LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	56.0	CASING	4.50	4.00		INSERT	STEEL
56.0	65.0	OPEN HOLE	4.00				
40.0	56.0	GRAVEL PACK				PEA SIZE	GRAVEL
44.0	55.0	PERFORATIONS				WELDED	
10.0	40.0	CASING GROUT					BENTONITE

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 2001 Jan 22

Pumping Rate: 30.000 Imp. gallons/minute

Water level before pumping: 32.0 ft. below ground

Pumping level at end of test: 60.0 ft. below ground

Test duration: ??? hours, ?? minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, SE CORNER OF PROPERTY.

Location: NE16-11-4E

Well_PID: 111323

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: 12 INCH SUPPLY WELL

Well Use: TEST WELL

Water Use: Industrial

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY:

UTMZ:

Accuracy Z:

Date Completed: 1998 May 26

WELL LOG

From (ft.)	To (ft.)	Log
0	45.0	CLAY
45.0	55.0	TILL
55.0	138.0	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	56.0	CASING	5.00				GALVANIZED
56.0	138.0	OPEN HOLE	4.50				

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 1998 May 26
Pumping Rate: 80.000 Imp. gallons/minute
Water level before pumping: 34.7 ft. below ground
Pumping level at end of test: 35.3 ft. below ground
Test duration: 1 hours, minutes
Water temperature: ?? degrees F

REMARKS

999 REDONDA, PULLED CASING ON TEST HOLE & 12 INCH WELL INSTALLED

Location: NE16-11-4E

Well_PID: 111324
Owner: X-POTENTIAL
Driller: Paul Slusarchuk Well Drilling LTd.
Well Name: 12 INCH SUPPLY WELL
Well Use: PRODUCTION
Water Use: Industrial
UTMX: 644608.1110
UTMY: 5532407.76
Accuracy XY:
UTMZ:
Accuracy Z:
Date Completed: 1998 Jul 15

WELL LOG

From (ft.)	To (ft.)	Log
0	45.0	CLAY
45.0	55.0	TILL
55.0	148.0	LIMESTONE, MAJOR FRACTURE ZONE 59-65 FEET

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	58.0	CASING	12.00				STEEL
58.0	148.0	OPEN HOLE	11.00				
0	40.0	CASING GROUT					CEMENT

Top of Casing: 2.000 ft. above ground

PUMPING TEST

Date: 1998 Jul 20

Pumping Rate: 641.003 Imp. gallons/minute

Water level before pumping: 37.0 ft. below ground

Pumping level at end of test: 50.7 ft. below ground

Test duration: 24 hours, minutes

Water temperature: ?? degrees F

REMARKS

999 REDONDA, WATER USED FOR INDUSTRIAL COOLING

Location: NE16-11-4E

Well_PID: 77063

Owner: X-POTENTIAL

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: NORTH WELL

Well Use: RECHARGE

Water Use: Industrial

UTMX: 644608.1110

UTMY: 5532407.76

Accuracy XY: UNKNOWN

UTMZ:

Accuracy Z: UNKNOWN

Date Completed: 1993 Oct 05

WELL LOG

From (ft.)	To (ft.)	Log
0	37.0	CLAY
37.0	45.0	TILL AND RUBBLE LIMESTONE
45.0	53.0	RUBBLE LIMESTONE AND TILL
53.0	267.8	LIMESTONE

WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	54.5	casing	6.50			INSERT	BLACK IRON
54.5	267.8	open hole	6.00				
0	0	casing grout					CEMENT

Top of Casing: 1.000 ft. above ground

PUMPING TEST

Date: 1993 Oct 05
Pumping Rate: 167.005 Imp. gallons/minute
Water level before pumping: 34.1 ft. below ground
Pumping level at end of test: 45.6 ft. below ground
Test duration: 17 hours, 30 minutes
Water temperature: ?? degrees F

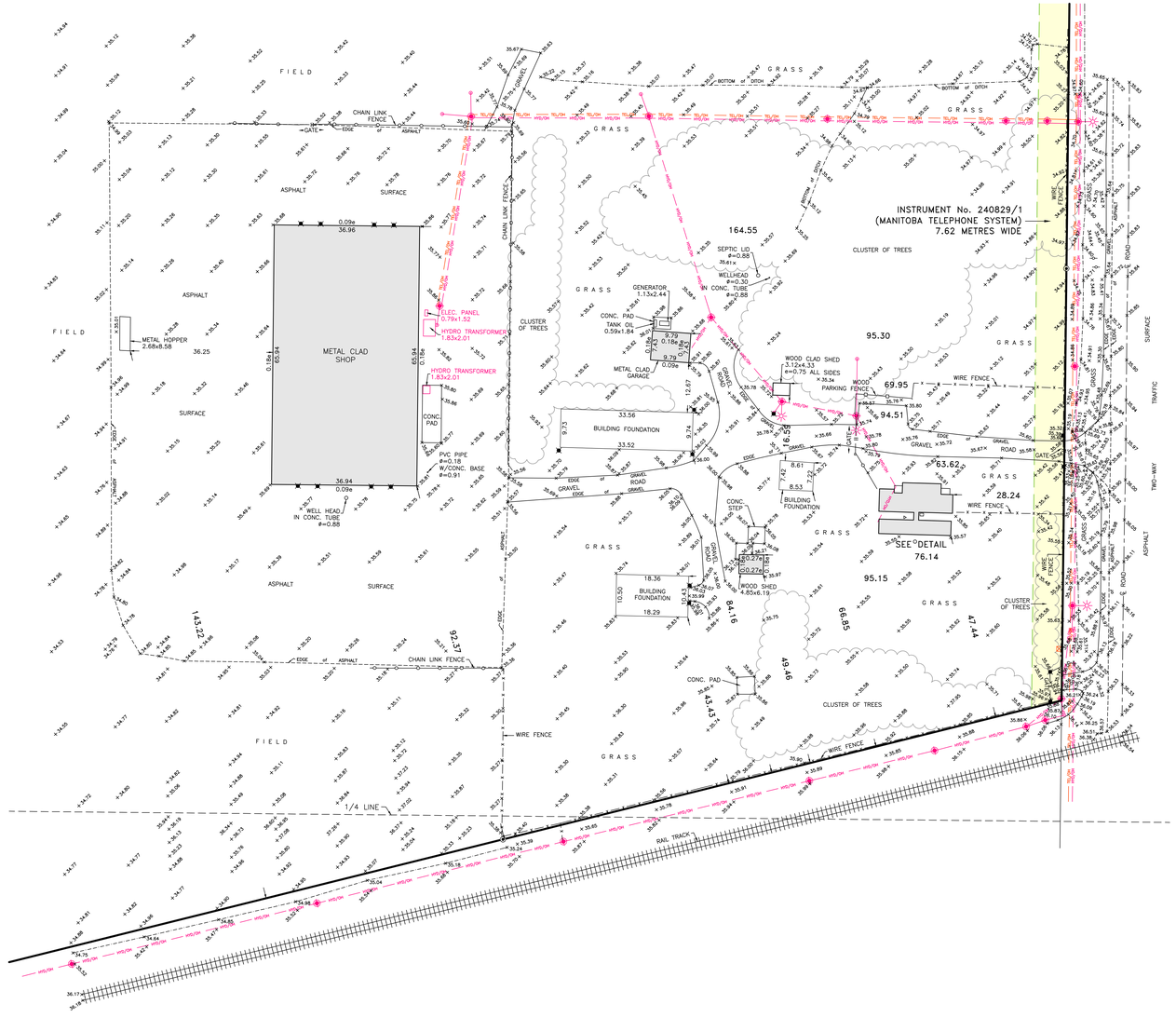
REMARKS

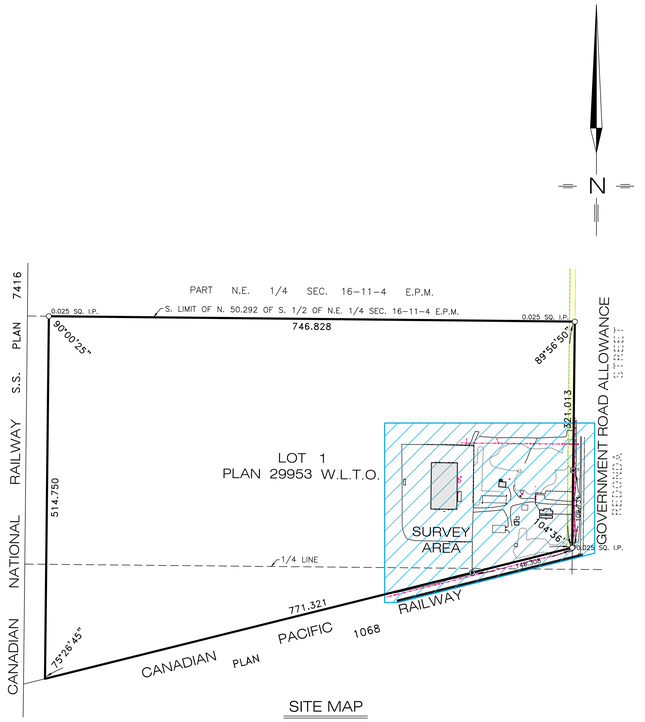
999 REDONDA, PUMPED WITH AIR, WELL ACIDIZED WITH 100 GAL ACID TO

Appendix D

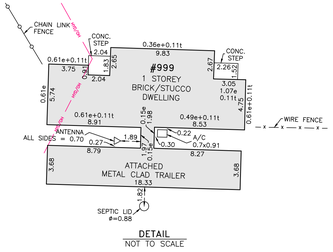
Topographic Plan

METRIC





SITE MAP



DETAIL
NOT TO SCALE

FILE: 19-1234
DWG: 19-1234-1-TOPO
FB: B&D 1312-137/139

AN

BARNES & DUNCAN SURVEYING, ENGINEERING & GEOMATICS 1906

6 DONALD STREET
WINNIPEG, MANITOBA
R3L 0K6

CLIENT:
wood.

999 REDONA STREET
R.M. OF SPRINGFIELD, MANITOBA

PLAN OF TOPOGRAPHIC SURVEY OF PART OF E. 1/2 OF SECTION 16, TOWNSHIP 11, RANGE 3 E.P.M.

BEING

LOT 1, PLAN 29953

R.M. OF SPRINGFIELD MANITOBA

SCALE - 1 : 500

5 0 5 10 15 20 25 30 35 40 45 50 METRES

TITLE INFORMATION:

CERTIFICATE OF TITLE:	2005569/1 W.L.T.O. (SEARCH DATE: NOVEMBER 14, 2019)
REGISTERED OWNER:	XPOTENTIAL PRODUCTS INC.
LEGAL DESCRIPTION:	LOT 1, PLAN 29953 WLTO IN E 1/2 16-11-4 EPM
ENCUMBRANCES:	INSTRUMENTS NUMBERED 240829/1 AND 2606108/1 ARE REGISTERED AGAINST THE ABOVE CERTIFICATE OF TITLE. ENCUMBRANCES NOTED HEREIN ARE PROVIDED FOR INFORMATION ONLY AND HAVE NOT BEEN INVESTIGATED AS TO THEIR INTENT OR EXTENT.

LEGEND

Survey monuments found on the ground are described and shown thus
0.013 diam. iron posts are placed at all points shown thus
Property Lines and Dimensions 100.000
Fences CHAIN LINK OR WIRE OR WOOD
Street and Traffic Signs
Power Poles
Power Poles with Light
Guy Wire Anchors
MTS Boxes
Guard Posts
Telephone Cables (overhead) TEL/OH
Hydro Cables (overhead) HYD/OH

NOTES

All dimensions are in metres and may be converted to feet by multiplying by 3.28084 .
Elevations are referred to Geodetic Datum and are indicated thus x 35.05
For Geodetic Elevations add 200.0 to all elevations shown.
Elevations are referred to City of Winnipeg Bench Mark No. 10-030, having an elevation of 233.068 metres.
Confirmation of existence and exact location of all services must be obtained from the individual utilities before proceeding with construction.

This survey was made between the 16th day of November and the 13th day of December, 2019.

SHOULD INFORMATION ON THE DIGITAL FILE DIFFER FROM THE INFORMATION SHOWN ON THE ORIGINAL HARD COPY, AS PROVIDED BY OUR FIRM, THE LATTER WILL GOVERN.

K. TODD BALEY, M.L.S.
DATED THIS 16th DAY OF DECEMBER, 2019

Appendix E

Assessment Criteria

Assessment Criteria & Regulatory Information

General

Manitoba Sustainable Development has adopted the principals established by the CCME for environmental management and assessment of sites in Manitoba, in addition to the requirements of the Manitoba Contaminated Sites Remediation Act (CSRA) and the Manitoba Contaminated Sites Remediation Regulation (CSRR), M.R. 105/97. The ESA process in Manitoba is outlined in the MSD June 2016 Guideline document "Environmental Site Assessments in Manitoba" which discusses the derivation process to determine the applicable Assessment Guidelines and Reporting Standards for potentially contaminated soil, groundwater, surface water or sediment.

The Assessment Guidelines for the Site are used to determine the significance of risk to human health and the environment associated with the contamination discovered by an ESA and what future action is recommended to address the risk for the site. The Assessment Guidelines can be derived primarily from the Environmental Quality Guidelines (EQGs) published by CCME; however, should the CCME not provide adequate information or guidance, documents from other jurisdictions may be used, provided they are supported as the most scientifically valid Assessment Guidelines for the Site. The Assessment Guidelines may differ from the applicable Reporting Standards.

The following documents produced by CCME were selected as being applicable for assessment of the Site dependent on the contaminants of concern, pathways and receptors:

- CCME 1999 (updates to 2019). Canadian Environmental Quality Guidelines (EQGs).
- CCME 2001 (revised 2008). Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil.
- Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) (October 2014).

Based on the conditions present at the Site, the following documents may be used for groundwater assessment:

- Government of Alberta, Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines January 2019 (AEP 2019).
- Ontario Ministry of the Environment. (MOE, 2011). Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act.

As determined by CCME (A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines, 2006), a tiered framework can be employed for the screening and assessment of contaminated sites. The framework relies on generic guidelines (Tier 1) and site-specific objectives (Tiers 2 and 3). The generic guidelines are simple numerical values, based on generic scenarios developed for different land uses, and employ conservative assumptions. Generic guidelines help evaluate the relative risk posed by contaminants at a site but may not always be an appropriate indication of actual risk based on-site conditions. Site-specific remediation objectives may be developed, either by modifying (within limits) the generic remediation objectives based on site-specific conditions (Tier 2) or by conducting a human health and/or ecological risk assessment (Tier 3).

The most common assessment guideline approach used in Manitoba is the Tier 2 protocol employing published individual guidelines based on the pathways and/or receptors that could be applicable to the Site. Adequate information must be acquired during the investigation to justify the inclusion or exclusion

of each of the exposure pathways. The published guidelines (CCME, Health Canada, AEP, or MOE) provide guidance as to what information is needed to determine if a pathway and/or receptor is applicable to a site or if it can be excluded.

Based on the listed published guideline documents (and their precursors), Wood conducted an evaluation of the applicable exposure pathways, land uses, key receptors and a visual evaluation of the predominant soil texture at the Site. The evaluation was conducted in accordance with CCME 2006 protocols and did not include the modification or recalculation of the formulas used to derive the Assessment Guideline values. The most stringent of the applicable exposure pathway guideline values was employed for assessment of each contaminant in soil, groundwater, and soil vapour.

The Contaminated Site Remediation Regulation (CSRR) establishes criteria (Reporting Standards) for when it is necessary to submit a site report to MSD. The applicable Reporting Standards are derived from the primary, secondary and tertiary standards (or their current equivalent) listed within the CSRR. The reporting standards listed includes the CCME EQG values as the primary values augmented by the MOE, Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, 2011 and the AEP, Tier 1 Soil and Groundwater Remediation Guidelines, 2019. The selection of Reporting Standard is based on the most applicable standard for the parameters and/or applicable Site conditions. Further adjustment of the Reporting Standards may be considered in order to use Tier 2 values for the standards outlined in the CSRR, should sufficient site characterization data be available. As such, the CSRA reporting threshold values may not be equivalent to the exposure pathway Assessment Guidelines.

Land Use

CCME has developed four generic land uses for use in assessment using these guidelines. A generic land use scenario is envisioned for each category based on the normal activities on these lands. The four land uses as defined by CCME are:

Agricultural lands: Agricultural land encompasses a wide range of activities including dairy, livestock and/or crop production. Most farms include a homestead, so the possible presence of an on-site residence (similar to those specified for residential/parkland sites, below) is considered in the default scenario. Agricultural lands are generally accessible by the farmer and his/her family members, including children, which represent the more sensitive human receptor category. Therefore, the critical human receptor in the agricultural land use category is assumed to be a toddler who receives 100% of his/her daily intake of soil and drinking water (groundwater) from the property.

Residential/Parkland: The generic residential property is a typical detached, single-family home with a backyard where children, particularly toddlers, play. The critical receptor assumed on a residential property is a toddler who receives 100% of his/her daily intake of soil, drinking water (groundwater), and air (indoors) from the property. Separate guidelines have been developed for two house foundation construction styles; below grade concrete foundation wall and floor slab (basement) and concrete slab-on-grade foundation. Parks may serve as areas for children's play and other family activities and are therefore also included in the residential land use category.

Commercial: Commercial properties span a wide variety of uses with varying degrees of public access. For purposes of criteria, the generic commercial property is assumed to contain a daycare facility, a sensitive commercial property use that is permitted in many municipal jurisdictions in Canada. It is

assumed that the critical receptor (toddler) spends a substantial portion of the weekdays at a daycare. In particular, it is assumed that the toddler spends 10 hours per day, 5 days per week for 48 weeks per year at the daycare. The toddler thereby receives an amount of his/her daily intake of drinking water (groundwater), and air (indoors) from the commercial property proportional to the number of hours per day, days per week and weeks per year spent at the facility. Intake via direct contact with soil (soil ingestion and dermal contact) is proportional to the days per week and weeks per year spent at the facility. Most commercial buildings are constructed with concrete slab-on-grade foundations.

Industrial: Industrial properties span a wide variety of uses but generally do not permit direct public access and therefore, children are not likely or frequently present. For purposes of deriving criteria, the generic industrial property is assumed to be a site with a building frequented by an adult worker who spends 10 hours per day, 5 days per week for 48 weeks per year on the property. The adult receptor thereby receives an amount of his/her daily intake of drinking water (groundwater), and air (indoors) from the industrial property proportional to the number of hours per day, days per week and weeks per year spent at the facility. Intake via direct contact with soil (soil ingestion and dermal contact) is proportional to the days per week and weeks per year spent at the facility. Most industrial buildings are constructed with concrete slab-on-grade foundations.

The Site is currently zoned as industrial land use, and proposed future land use is industrial.

The Site and surrounding land use is shown on Figure 1 and summarized in Table 1.

Grain Size Designation

CCME guidelines are prescribed for coarse-grained and fine-grained soils for Site assessments. Fine-grained soils are defined as having a median grain size of less than or equal to 75 µm; coarse-grained soils have a median grain size of greater than 75 µm. Where both fine- and coarse-grained strata are present, the dominant soil particle size is determined by the stratum governing horizontal and vertical migration to a receptor.

Grain size analysis was not completed as on two samples as part of the assessment:

- TH19-01 – 0.8 m bgl (clay) – 2 %>75 µm – Fine

Based on the results of the grain size analysis, native soils at the Site are predominantly fine-grained in nature. In general medium to high plastic clay was observed below the surface soil layer and extended to the maximum depth explored at each test hole. Based on the above, the Site is characterized as fine-grained for the purpose of this assessment.

Applicable Exposure Pathways

Human Exposure Pathways

Potential human exposure pathways for commercial/industrial sites include the following: direct contact (soil ingestion, dermal contact, and soil inhalation), indoor vapour inhalation, and the protection of potable groundwater. Applicability of each of these potential exposure pathways is discussed in the following sections.

Soil Ingestion and Dermal Contact

Currently, portions of the Site are covered by concrete pads and buildings, however the majority of the Site is covered by vegetated areas. As such the direct contact (soil ingestion and dermal contact) pathway is considered applicable to the surface soil horizon.

The direct contact pathway is not considered applicable for the subsoil as the surface soil creates a suitable barrier to avoid contact. It is assumed that any ground disturbance in which soils at depth previously not accessible are brought to ground surface would result in short-term exposure and not be considered applicable to the exposure models in which the CCME guidelines are derived.

Vapour Inhalation

The indoor vapour inhalation pathway would be considered applicable to the Site as there are buildings present on Site.

Protection of Potable Groundwater

CCME considers all water bearing units as a potential potable groundwater resource; however, CCME defines a water bearing unit as having a hydraulic conductivity of greater than 10^{-4} cm/s. Furthermore, MSD recognizes the division between contaminated soil and groundwater that is not hydraulically connected to an underlying aquifer. A 5 m thickness of massive unfractured saturated fine-grained material, with a bulk hydraulic conductivity less than 10^{-5} cm/s is considered sufficient isolation of groundwater aquifers.

A water well records review was conducted by Wood, using the MSD GW Drill data base. The search determined that groundwater at the Site and within a 500 m radius of the Site are used for domestic purposes. These well records indicate the wells are installed into a depth of approximately 15 m. The water well records information for the Site is included in Appendix C. Based on the stratigraphic information from the water well records, as well as stratigraphic observations at the Site, a substantial thickness (> 6 m) of fine grained soil exists over the underlying aquifer, providing a sufficient confining layer as verified during test hole drilling.

As such, the potable groundwater pathway is not considered to be applicable for the assessment of near surface soil and groundwater Site.

As a water sample was collected from the water well located near the warehouse building, the applicable potable groundwater will be used for the assessment water quality from this well only.

Ecological Exposure Pathways

The potential ecological exposure pathway at the Site is the ecological soil contact and freshwater aquatic life pathways.

Ecological Soil Contact

The ecological soil contact pathway is protective of potential ecological receptor exposure, from terrestrial and subterranean organisms and plant root systems, to soils in the surface soil horizon. Presently, as the majority of the Site is covered by grass and other vegetation, the ecological pathway is applicable.

Ecological receptor direct contact exposure to soils in the subsoil horizon is not considered applicable as the surface soil creates a suitable barrier to avoid subsoil ecological contact from organisms at the ground surface and the subsoil horizon is not typically suitable to support invertebrates or burrowing mammals.

Freshwater Aquatic Life Pathway

CCME states that the freshwater aquatic life pathway may be excluded in cases where there is no surface water body within 10 m of a site classified as fine-grained and 500 m of a site classified as coarse-grain. If a surface water body is within 500 m, it must be assessed to determine whether the freshwater aquatic life pathway is applicable.

The nearest permanent surface water body is the Red River Floodway800 m east of the Site. Based on information provided and the fine-grained soil encountered during the subsurface investigations, the protection of fresh water aquatic life pathway is not considered applicable to the assessment.

Miscellaneous Criteria

As commercial land use criteria are applicable to the Site, soil management limits as produced by CCME for PHCs are applicable to the assessment.

Management Limit

The management limits for PHCs applies for all soils in the surface soil and subsoil horizon.

Off-Site Migration Check

Surrounding properties include residential dwellings, which is a more sensitive land usage. Therefore, off-Site migration check does apply to the Site.

CCME 1991 Interim Criteria

CCME initially developed interim criteria for many potential contaminants in 1991. With the publishing of the Canadian Environmental Quality Guidelines in 1999 (and subsequent updates), CCME adopted a risk based scientific approach to determining soil quality guidelines. While many of the interim criteria have been superseded by updated guidelines, there are still contaminants, including several PAH, VOC and metal parameters, in which new guidelines have not yet been developed for all exposure pathways and, in some cases, the interim criteria still remain as the only guideline for assessment comparison.

Summary of Applicable Assessment Guidelines

Given the current and inferred future industrial land use of the Site, the fine-grained nature of the soil and the applicable exposure pathways as outlined in the previous sections, Wood determined assessment guidelines for each contaminant of concern. The most stringent of the applicable exposure pathway guideline values as produced by CCME was used for each contaminant for both the surface soil and subsoil horizons and groundwater. Where CCME did not provide an assessment guideline, applicable guidelines from other jurisdictions were included, based on applicability to the Site conditions. The limiting exposure pathways are presented in Table D-1 (Appendix D).

Wood has chosen the following applicable risk guideline criteria for the Site:

PHC Soil Assessment Guidelines

Above 1.5 m grade:

Industrial values for fine-grained soil in a non-potable groundwater situation as limited by the:

- Indoor Vapour Inhalation (Slab on Grade) exposure pathway for benzene;
- Ecological Soil Contact exposure pathway for toluene, ethylbenzene, xylenes and PHC fraction F1 – F4.

Below 1.5 m grade:

Industrial values for fine-grained soil in a non-potable groundwater situation as limited by the:

- Indoor Vapour Inhalation (Slab on Grade) exposure pathway for benzene, toluene, ethylbenzene, xylenes; and
- Management Limits for PHC fractions F1 – F4.

Metals Soil Assessment Guidelines

Industrial values as limited by the:

- Soil Ingestion exposure pathway for arsenic,;
- Ecological Soil Contact exposure for cadmium, chromium, copper, lead, nickel, selenium, thallium, vanadium and zinc; and
- Interim Soil Quality Criterion for antimony, barium, beryllium, hexavalent chromium, cobalt, molybdenum, silver, and tin.

PAH Soil Assessment Guidelines

Industrial values for fine-grained soil in a non-potable groundwater situation as limited by the:

- Soil Contact exposure pathway for anthracene, benzo(a)pyrene, fluoranthene and B[a]P TEP;
- Provisional Soil Quality Guideline for Napthalene; and
- Interim Criteria for benzo(a)anthracene, benzo(b+j)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,23-cd)pyrene, phenanthrene and pyrene.

VOC Soil Assessment Guidelines

Industrial values for fine-grained soil in a non-potable groundwater situation as limited by the:

- Interim Criteria for carbon tetrachloride, chlorobenzene, chloroform, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, dichloromethane, 1,2-dichloropropane, styrene, 1,1,2,2-tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, tetrachloroethene and trichloroethene.

There are no guidelines available for the remaining VOC parameters and therefore the analytical results are compared to the MOE Table 3 criteria.

PCB (Total) Soil Assessment Guidelines

Industrial values for fine-grained soil in a non-potable groundwater situation as limited by the soil contact exposure pathway

Groundwater Assessment Guidelines (Monitoring Wells)

Based on the exposure scenario present at the Site, Commercial/Industrial values for fine-grained soil in a non-potable groundwater situation have been used for groundwater comparison. As CCME does not provide applicable groundwater criteria for the conditions at the Site, the AEP 2019 Groundwater Remediation Guideline Values have been used for the purposes of this assessment.

- Inhalation exposure pathway for benzene, methylnaphthalenes, acetone, bromoform, bromomethane, carbon tetrachloride, chlorobenzene, dibromochloromethane, ethylene dibromide, 1,4-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis 1,2-dichloroethene, trans 1,2-dichloroethene, dichloromethane, 1,2-dichloropropane, 1,3-dichloropropene, hexachlorobutadiene, methyl butyl ketone, MEK, MIBK, MTBE, 1,1,1,2-tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-Trichloroethane, trichloroethene (TCE), and vinyl chloride; and
- Soil Organisms Direct Contact exposure for toluene, ethylbenzene, xylenes, PHC fraction F1 – F2, anthracene, benzo(a)pyrene, and fluoranthene.

Groundwater Assessment Criteria (Water Well Sample)

- The Health Canada GCDWQ Maximum Acceptable Concentrations (MAC) are considered applicable for benzene, and xylenes;
- Dioxin and Furan Toxic Equivalency Factor (TEQ) guideline from MOE 2011 Table 2 (potable) and us compared to the upper bound result.

TABLE D-1: ASSESSMENT CRITERIA - Soil PHCs

Fine-Grained Soil Criteria (mg/kg)									
Criteria - Land Use	**Exposure Pathway**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**PHC Fraction F1**	**PHC Fraction F2**	**PHC Fraction F3**	**PHC Fraction F4**
CCME - Industrial Surface Soil (≤ 1.5 m)	Soil Ingestion	110	NA	620,000	NA	RES	RES	RES	RES
	Dermal Contact	250	NA	560,000	NA	RES	RES	RES	RES
	Indoor Vapour Inhalation (slab on grade)	**2.8**	13,000	6500	1600	4600	23000	NA	NA
	Off-Site Migration Check	NG	NG	NG	NG	NA	NA	4300	RES
	Ecological Soil Contact	310	**330**	**430**	**230**	**320**	**260**	**2500**	**6600**
	Management Limits	NG	NG	NG	NG	800	1000	5000	10000
MSD Reporting Standard	**Surface Soil (≤1.5 m)**	**2.8**	**330**	**430**	**230**	**320**	**260**	**2,500**	**6,600**
MSD Reporting Standards Selected From		**CCME**	**CCME**	**CCME**	**CCME**	**CCME**	**CCME**	**CCME**	**CCME**
CCME - Industrial Subsurface Soil (< 1.5	Indoor Vapour Inhalation (slab on grade)	**2.9**	**13,000**	**6700**	**1600**	4600	23000	NA	NA
	Management Limits	NG	NG	NG	NG	**800**	**1000**	**5000**	**10000**
Applicable Soil Guidelines	**Subsurface Soil (> 1.5 m)**	**2.9**	**13,000**	**6,700**	**1,600**	**800**	**1,000**	**5,000**	**10,000**
MSD Reporting Standards Selected From		**CCME**	**CCME**	**CCME**	**CCME**	**CCME**	**CCME**	**CCME**	**CCME**

- Benzene guidelines were selected based on the 10^{-5} incremental risk for human health
- MCC Reporting Standards - Manitoba Conservaiton and Climate Reporting standards as per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR). Values based on CCME standards unless noted.
- mg/kg - milligrams per kilogram
- mg/L - milligrams per liter
- PHC Fraction F1 - volatile petroleum hydrocarbons (C_6 – C_{10}), less BTEX
- PHC Fraction F2 - extractable petroleum hydrocarbons (C_{10} – C_{16})
- PHC Fraction F3 - extractable petroleum hydrocarbons (C_{16} – C_{34})
- PHC Fraction F4 - extractable petroleum hydrocarbons (C_{34} – C_{50})
- NC - not calculated
- NG - no guideline available
- NA - not applicable, calculated value exceeds 1,000,000 mg/kg
- NGR - no guideline required - Calculated value is greater than solubility or 1,000,000 mg/L.
- RES - Residual PHC formation. Calculated value exceeds 30,000 mg/kg and solubility limit for PHC fraction.
- CCME EQG Criteria – industrial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) “Canadian Environmental Quality Guidelines”, 1999 (updates to 2019).
- CCME CWS PHC Criteria - industriial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) “Canada-Wide Standards for Hydrocarbons in Soil”, 2001, revised 2008.
- AEP - Alberta Tier 2 Soil and Groundwater Remediation Guidelines (2019)
- Health Canada. 2019. Guidelines for Canadian Drinking Water Quality Summary Table.

TABLE D-1: ASSESSMENT CRITERIA - METALS

Land Use	Exposure Pathway	Soil Guidelines (mg/kg) (Metals)										
		Aluminum	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Bismuth**	**Boron**	**Cadmium**	**Calcium**	**Chromium**	**Cobalt**
Industrial	Soil Ingestion[HH]	NG	NC	**12**	10000	NC	NG	NG	49	NG	630	NC
	Indoor Vapour Inhalation[HH]	NG	NC	NC	NC	NC	NG	NG	NC	NG	NC	NC
	Off-Site Migration Check [HH]	NG	NC	NC	96000	NC	NG	NG	NC	NG	NC	NC
	Ecological Soil Contact [EH]	NG	NC	26	NC	NC	NG	NG	**22**	NG	**87**	NC
	Provisional SQG[EH]	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Interim Criteria [2]	NG	**40**	50	**2000**	**8**	NG	NG	20	NG	800	**300**
	Assessment Criteria [1]	**NG**	**40**	**12**	**2000**	**8**	**NG**	**120**	**22**	**NG**	**87**	**300**
Land Use	**Exposure Pathway**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Molybdenum**	**Nickel**	**Phosphorus**	**Potassium**	**Selenium**	**Silver**
Industrial	Soil Ingestion[HH]	4000	NG	8200	NG	NG	NC	310	NG	NG	125	NC
	Indoor Vapour Inhalation[HH]	NC	NG	NC	NG	NG	NC	10000	NG	NG	NC	NC
	Off-Site Migration Check [HH]	NC	NG	740	NG	NG	NC	2500	NG	NG	1135	NC
	Ecological Soil Contact[EH]	**91**	NG	**600**	NG	NG	NC	**89**	NG	NG	**2.9**	NC
	Provisional SQG[EH]	NC	NC	NC	NC	NC	NC	NG	NC	NG	NG	NG
	Interim Criteria [2]	500	NG	1000	NG	NG	**40**	500	NG	NG	10	**40**
	Assessment Criteria [1]	**91**	**NG**	**600**	**NG**	**NG**	**40**	**89**	**NG**	**NG**	**2.9**	**40**
Land Use	**Exposure Pathway**	**Sodium**	**Strontium**	**Sulfur**	**Thallium**	**Tin**	**Titanium**	**Tungsten**	**Uranium**	**Vanadium**	**Zinc**	**Zirconium**
Industrial	Soil Ingestion[HH]	NG	NG	NG	NC	NC	NG	NG	510	NC	140000	NC
	Indoor Vapour Inhalation[HH]	NG	NG	NG	NC	NC	NG	NG	NC	NC	NG	NC
	Off-Site Migration Check [HH]	NG	NG	NG	NC	NC	NG	NG	**300**	NC	140000	NC
	Ecological Soil Contact[EH]	NG	NG	NG	**3.6**	NC	NG	NG	2000	**130**	**450**	NC
	Provisional SQG[EH]	NG	NG	NG	1	NG	NG	NG	NG	NC	NC	NG
	Interim Criteria [2]	NG	NG	NG	NG	**300**	NG	NG	NG	NG	1500	NG
	Assessment Criteria [1]	**NG**	**NG**	**NG**	**3.6**	**300**	**NG**	**NG**	**300**	**130**	**450**	**NG**

Notes:

[1] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . Criteria are based on CCME standards unless otherwise noted

[2] Interim Criteria based on non-scientific rational. In the case where a scientific defensible value established for an exposure pathway is greater than the interim criteria value, the scientific defensible value will be considered applicable

- mg/kg - concentration in milligrams per kilogram equivlanet to µg
- HH = Human Health
- EH = Environmental Health

wood.

TABLE D-1: ASSESSMENT CRITERIA - INDUSTRIAL - PAHs

Land Use	Exposure Pathway	Soil Guidelines (mg/kg) (PAHs) [4]										
		Acenaphthene	**Acenaphthylene**	**Acridine**	**Anthracene**	**Benzo(a) anthracene**	**Benzo(a)pyrene**	**Benzo(b+j) fluoranthene**	**Benzo(b+j+k) fluoranthene**	**Benzo(g,h,i) perylene**	**Benzo(k) fluoranthene**	**Chrysene**
Industrial	Soil Contact[6 HH]	NC	NC	NG	**32**	NC	**72**	NC	NG	NC	NC	NC
	Soil and Food Ingestion[HH]	NC	NC	NG	NC	NC	NC	NC	NG	NC	NC	NC
	Provisional SQG[EH]	NG	NG	NG	NG	NG	1.4	NG	NG	NG	NG	NG
	Interim Criteria[5]	NG	NG	NG	NG	**10**	NG	**10**	NG	NG	**10**	NG
	Assessment Criteria [3]	**96 [7]**	**0.17 [7]**	**NG**	**32**	**10**	**72**	**10**	**NG**	**9.6 [7]**	**10**	**9.6 [7]**

Land Use	Exposure Pathway	**Dibenzo(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-cd) pyrene**	**2-Methyl naphthalene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**B(a)p TEP [1]**
Industrial	Soil Contact[6 HH]	NC	**180**	NC	NC	NG	NC	NC	NC	**5.3**
	Soil and Food Ingestion[HH]	NC	NC	NC	NC	NG	NC	NC	NC	NG
	Provisional SQG[EH]	NG	NG	NG	NG	NG	**22**	NG	NG	NG
	Interim Criteria[5]	**10**	NG	NG	**10**	NG	NG	**50**	**100**	NG
	Assement Criteria [3]	**10**	**180**	**69 [7]**	**10**	**85 [7]**	**22**	**50**	**100**	**5.3**

Notes:

[1] B(a)P TEP guidelines were selected based on the 10^{-5} incremental risk for human health

[2] Combined values for soil injection and dermal contact for exposure pathway value will be considered applicable.

[3] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . Criteria are based on CCME standards unless otherwise noted

[4] PAHs, VOC, and metals (with the exception of PCE and TCE) are independent of soil grain size or sample depth.

[5] Interim Criteria based on non-scientific rational. In the case where a scientific defensible value established for an exposure pathway is greater than the interim criteria value, the scientific defensible value will be considered applicable.

[6] Direct contact may be a combination and/or lowest of soil injestion, soil dermal contact, and particulate inhalation

[7] Standards Selected from the Ontario Ministry of Environment's Full Depth Generic Site Conditions Standards in a Non-Potable Groundwater Condition. Table 3. 2011.

- PHC (F1) - volatile petroleum hydrocarbons (C_6 – C_{10})
- PHC (F2) - extractable petroleum hydrocarbons (C_{10} – C_{16})
- PHC (F3) - extractable petroleum hydrocarbons (C_{16} – C_{34})
- PHC (F4) - extractable petroleum hydrocarbons (C_{34} – C_{50})
- mg/kg - concentration in milligrams per kilogram equivlanet to µ
- HH = Human Health
- EH = Environmental Health
- **BOLD** – selected guideline
- ***Italics*** – MSD Reporting Standard
- NA - not applicable, calculated value exceeds 1,000,000 mg/kg
- "--" CCME does not evaluate parameter
- NC - not calculated
- NG - no guideline available
- RES - Residual PHC formation. Calculated value exceeds 30,000 mg/kg and solubility limit for PHC fraction.
- CCME EQG Guideline – commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updates to 2018).
- CCME CWS PHC Guideline - commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2001, revised 2008.

wood.

TABLE D-1: ASSESSMENT CRITERIA - INDUSTRIAL - VOCs

Land Use	Exposure Pathway	Fine Grained Soil Guidelines (µg/g) (VOCs) [2]									
		Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon disulfide
Industrial	Interim Soil Quality Criterion[5]	--	--	--	--	--	--	--	--	--	--
	Assessment Criteria	28 [7]	NG	18 [7]	18 [7]	1.7 [7]	0.05 [7]	NG	NG	NG	NG
Land Use	Exposure Pathway	Carbon Tetrachloride	Chlorobenzene	Dibromochloromethane	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (Ethylene dibromide)
Industrial	Interim Soil Quality Criterion[5]	50	10	NG	--	50	--	--	--	--	--
	Assessment Criteria	50	10	13 [7]	NG	50	NG	NG	NG	NG	0.05 [7]
Land Use	Exposure Pathway	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-dichloroethane	1,2-Dichloroethane	1,1-dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
Industrial	Interim Soil Quality Criterion[5]	--	10	10	10	--	50	50	50	50	50
	Assessment Criteria	NG	10	10	10	25 [7]	50	50	50	50	50
Land Use	Exposure Pathway	Dichloromethane	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Hexachlorobutadiene	Hexane	2-Hexanone (Methyl butyl ketone)
Industrial	Interim Soil Quality Criterion[5]	50	50	--	--	--	--	--	NG	--	--
	Assessment Criteria	50	50	NG	NG	NG	0.21 [7]	0.21 [7]	0.095 [7]	NG	NG
Land Use	Exposure Pathway	Isopropylbenzene	4-Isopropyltoluene	MEK	MIBK	MTBE	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene
Industrial	Interim Soil Quality Criterion[5]	--	--	--	--	NG	50	--	50	10	10
	Assessment Criteria	NG	NG	88 [7]	210 [7]	3.2 [7]	50	0.11 [7]	50	10	10
Land Use	Exposure Pathway	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl Chloride			
Industrial	Interim Soil Quality Criterion[5]	50	50	--	--	--	--	--			
	Assessment Criteria	50	50	5.8 [7]	NG	NG	NG	0.25 [7]			

Land Use	Exposure Pathway	Tetrachloroethene (PCE)	Trichloroethene (TCE)
Industrial	Direct contact[4]	NG	100
	Inhalation of Indoor Air Check	0.5	0.92
	Interim Soil Quality Criterion[5]	50	50
	Ecological Soil Contact (Provisional SQG)	34	50
	Assessment Criteria	0.5	0.92

Notes:

[1] Benzene guidelines were selected based on the 10^{-5} incremental risk for human health

[2] Combined values for soil injection and dermal contact for exposure pathway value will be considered applicable.

[3] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . Criteria are based on CCME standards unless otherwise noted

[4] PAHs, VOC, and metals (with the exception of PCE and TCE) are independent of soil grain size or sample depth.

[5] Interim Criteria based on non-scientific rational. In the case where a scientific defensible value established for an exposure pathway is greater than the interim criteria value, the scientific defensible value will be considered applicable.

[6] Direct contact may be a combination and/or lowest of soil ingestion, soil dermal contact, and particulate inhalation

[7] Standards Selected from the Ontario Ministry of Environment's Full Depth Generic Site Conditions Standards in a Non-Potable Groundwater Condition. Table 3. 2011.

- mg/kg - concentration in milligrams per kilogram equivlanet to µg/g - micro gram per gram
- HH = Human Health
- EH = Environmental Health

BOLD Applicable Assessment Guidelines

- NA - not applicable, calculated value exceeds 1,000,000 mg/kg
- "--" CCME does not evaluate parameter
- NC - not calculated
- NG - no guideline available
- RES - Residual PHC formation. Calculated value exceeds 30,000 mg/kg and solubility limit for PHC fraction.
- CCME EQG Guideline – commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999 (updates to 2018).
- CCME CWS PHC Guideline - commercial land use criteria as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2001, revised 2008.

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TABLE D-1: ASSESSMENT CRITERIA - INDUSTRIAL - PHCs

Fine-Grained Groundwater Criteria (mg/L)

Criteria	Exposure Pathway	Benzene	Toluene	Ethylbenzene	Xylenes	PHC Fraction F1	PHC Fraction F2	PHC Fraction F3	PHC Fraction F4
Health Canada	Drinking Water - MAC	**0.005**	**0.06**	**0.14**	**0.09**	NG	NG	NG	NG
	Drinking Water - AO	NG	0.024	0.0016	0.02	NG	NG	NG	NG
AEP	Potable	0.005	0.024	0.0016	0.02	2.2	1.1	NG	NG
	Vapour Inhalation	**19**	NG	NG	NG	NG	NG	NG	NG
	Eco-Soil Contact	540	**240**	**150**	**74**	**9.9**	**3.1**	**NG**	**NG**
Applicable Industrial Groundwater Guidelines		**19**	**240**	**150**	**74**	**9.9**	**3.1**	**NG**	**NG**

TABLE D-1: ASSESSMENT CRITERIA - INDUSTRIAL - Metals

Fine-Grained Groundwater Criteria (mg/L)

Criteria - Land Use	Exposure Pathway	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium
AEP - Industrial	Potable	NG	**0.006**	**0.01**	**1**	NG	NG	5	0.005	NG
	Vapour Inhalation	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Eco-Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG	NG
Assessment Criteria (non-potable)		**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**
Assessment Criteria (potable)		**NG**	**NG**	**0.01**	**1**	**NG**	**NG**	**5**	**0.005**	**NG**

Criteria - Land Use	Exposure Pathway	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum
AEP - Industrial	Potable	**0.05**	NG	**1**	**0.3**	**0.01**	NG	**0.05**	NG
	Vapour Inhalation	NG	NG	NG	NG	NG	NG	NG	NG
	Eco-Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG
Assessment Criteria (non-potable)		**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**
Assessment Criteria (potable)		**0.05**	**NG**	**1**	**0.3**	**0.01**	**NG**	**0.05**	**NG**
AEP - Industrial	Potable	NG	NG	NG	**0.02**	NG	NG	NG	NG
	Vapour Inhalation	NG	NG	NG	NG	NG	NG	NG	NG
	Management Limits	NG	NG	NG	NG	NG	NG	NG	NG
Assessment Criteria (non-potable)		**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**
Assessment Criteria (potable)		**NG**	**NG**	**NG**	**0.002**	**NG**	**NG**	**NG**	**NG**

Criteria - Land Use	Exposure Pathway	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
AEP - Industrial	Potable	NG	NG	NG	NG	**0.02**	NG	**5**	NG
	Vapour Inhalation	NG	NG	NG	NG	NG	NG	NG	NG
	Management Limits	NG	NG	NG	NG	NG	NG	NG	NG
Assessment Criteria (non-potable)		**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**
Assessment Criteria (potable)		**NG**	**NG**	**NG**	**NG**	**0.02**	**NG**	**5**	**NG**

BOLD Applicable Assessment Guidelines (non-potable)
BOLD Applicable Assessment Guidelines Water Well (potable)

Notes:

- mg/L - milligrams per Litre
- NC - not calculated
- NG - no guideline available
- NGR - no guideline required - Calculated value is greater than solubility or 1,000,000 mg/L.
- RES - Residual PHC formation. Calculated value exceeds 30,000 mg/kg and solubility limit for PHC fraction.
- AEP - Alberta Tier 2 Soil and Groundwater Remediation Guidelines (2019)

TABLE D-1: ASSESSMENT CRITERIA - INDUSTRIAL - PAHs

Land Use	Exposure Pathway	Fine Grained Groundwater Guidelines (mg/L) (PAHs) [4]										
		Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	
Industrial	Inhalation	NGR	NG	NG	NGR	NG	NG	NG	NG	NG	NG	
	Eco Soil Contact	NG	NG	NG	**0.32**	NG	**0.0066**	NG	NG	NG	NG	
	Assessment Criteria [1]	**NG**	**NG**	**NG**	**0.32**	**NG**	**0.0066**	**NG**	**NG**	**NG**	**NG**	
Land Use	**Exposure Pathway**	**Dibenzo(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-cd)pyrene**	**1-Methylnaphthalene**	**2-Methylnaphthalene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**Quinoline**	**B(a)p TEP [1]**
Industrial	Inhalation	NG	NGR	NGR	NG	NG	NG	NGR	NG	NGR	NG	NG
	Eco Soil Contact	NG	**0.86**	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Assessment Criteria [1]	**NG**	**0.86**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**

TABLE D-1: ASSESSMENT CRITERIA - INDUSTRIAL - VOCs

Land Use	Exposure Pathway	Fine Grained Groundwater Guidelines (mg/L) (VOCs)									
		Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon disulfide
Industrial	Inhalation	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Eco Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Assessment Criteria [1]	**NG**	**NG**	**NG**	**85 [2]**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**
Land Use	**Exposure Pathway**	**Carbon Tetrachloride**	**Chlorobenzene**	**Dibromochloromethane**	**Chloroethane**	**Chloroform**	**Chloromethane**	**2-Chlorotoluene**	**4-Chlorotoluene**	**1,2-Dibromo-3-chloropropane**	**1,2-Dibromoethane (Ethylene dibromide)**
Industrial	Inhalation	**0.08**	**2.2**	**250**	NG	**3.5**	NG	NG	NG	NG	NG
	Eco Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Assessment Criteria [1]	**0.08**	**2.2**	**250**	**NG**	**3.5**	**NG**	**NG**	**NG**	**NG**	**NG**
Land Use	**Exposure Pathway**	**Dibromomethane**	**1,2-Dichlorobenzene**	**1,3-Dichlorobenzene**	**1,4-Dichlorobenzene**	**Dichlorodifluoromethane**	**1,1-dichloroethane**	**1,2-Dichloroethane**	**1,1-dichloroethene**	**cis-1,2-Dichloroethene**	**trans-1,2-Dichloroethene**
Industrial	Inhalation	NG	NGR	NG	**32**	NG	**44**	**1.2**	**4.5**	NG	NG
	Eco Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Assessment Criteria [1]	**NG**	**9.6 [2]**	**9.6 [2]**	**32**	**4.4 [2]**	**44**	**1.2**	**4.5**	**NG**	**NG**
Land Use	**Exposure Pathway**	**Dichloromethane**	**1,2-Dichloropropane**	**1,3-Dichloropropene**	**2,2-Dichloropropane**	**1,1-Dichloropropene**	**cis-1,3-Dichloropropene**	**trans-1,3-Dichloropropene**	**Hexachlorobutadiene**	**Hexane**	**2-Hexanone (Methyl butyl ketone)**
Industrial	Inhalation	**410**	NG	NG	NG	NG	NG	NG	**0.22**	NG	NG
	Eco Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Assessment Criteria [1]	**410**	**NG**	**NG**	**NG**	**NG**	**NG**	**NG**	**0.22**	**0.52 [2]**	**NG**
Land Use	**Exposure Pathway**	**Isopropylbenzene**	**4-Isopropyltoluene**	**MEK**	**MIBK**	**MTBE**	**Styrene**	**1,1,1,2-Tetrachloroethane**	**1,1,2,2-Tetrachloroethane**	**Tetrachloroethene (PCE)**	**1,2,3-Trichlorobenzene**
Industrial	Inhalation	*NG*	*NG*	NG	NG	**40**	NGR	NG	NG	**1.8**	**6.9**
	Eco Soil Contact	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
	Assessment Criteria [1]	**NG**	**NG**	**NG**	**NG**	**40**	**0.0015 [2]**	**NG**	**NG**	**1.8**	**6.9**
Land Use	**Exposure Pathway**	**1,2,4-Trichlorobenzene**	**1,1,1-Trichloroethane**	**1,1,2-Trichloroethane**	**Trichloroethene (TCE)**	**Trichlorofluoromethane**	**1,2,3-Trichloropropane**	**1,2,4-Trimethylbenzene**	**1,3,5-Trimethylbenzene**	**Vinyl Chloride**	
Industrial	Inhalation	**6.1**	NG	NG	**2.8**	NG	NG	NG	NG	**0.12**	
	Eco Soil Contact	NG	NG	NG	73	NG	NG	NG	NG	NG	
	Assessment Criteria [1]	**6.1**	**NG**	**NG**	**2.8**	**2.5 [2]**	**NG**	**NG**	**NG**	**0.12**	

Notes:

[1] As per the Contaminated Sites Remediation Act (CSRA) and the standards for reporting established by regulation (CSRR) . Criteria are based on AEP 2019 Groundwater Remediation Guidelines unless otherwise noted

[2] Standards Selected from the Ontario Ministry of Environment's Full Depth Generic Site Conditions Standards in a Non-Potable Groundwater Condition. Table 3. 2011.

- mg/L - concentration in milligrams per kilogram equivlanet to µg/g - micro gram per gram
- **BOLD** – selected guideline
- NG - no guideline available
- NGR - no guideline required; calculated guideline exceeds solubility limit

Appendix F

Laboratory Reports

Wood Environment & Infrastructure Solutions (Winnipeg)
ATTN: KEVIN BEECHINOR
440 Dovercourt Drive
Winnipeg MB R3Y 1G4

Date Received: 08-JAN-20
Report Date: 21-JAN-20 12:06 (MT)
Version: FINAL

Client Phone: 204-488-2997

Certificate of Analysis

Lab Work Order #: L2403425

Project P.O. #: NOT SUBMITTED
Job Reference: WX18979 999 REDONDA
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-1 TH19-01 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	28.5		0.10	%		09-JAN-20	R4966151
Extractable Organic Halides (EOX)	See Attached					14-JAN-20	R4973593
% Particles > 75um (Coarse/Fine)							
% >75um	2.0		1.0	%	16-JAN-20	16-JAN-20	R4973298
General Texture Class	Fine				16-JAN-20	16-JAN-20	R4973298
Metals in Soil by CRC ICPMS							
Aluminum (Al)	31500		5000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Antimony (Sb)	0.31		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Arsenic (As)	9.34		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Barium (Ba)	195		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Beryllium (Be)	1.34		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Boron (B)	17.0		5.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Bismuth (Bi)	0.32		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cadmium (Cd)	0.164		0.020	mg/kg	13-JAN-20	13-JAN-20	R4968866
Calcium (Ca)	7110		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Chromium (Cr)	53.3		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cobalt (Co)	16.0		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Copper (Cu)	31.8		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Iron (Fe)	35600		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lead (Pb)	16.0		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lithium (Li)	36.0		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Magnesium (Mg)	15600		20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Manganese (Mn)	848		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Molybdenum (Mo)	0.32		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Nickel (Ni)	48.2		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Phosphorus (P)	542		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Potassium (K)	5850		100	mg/kg	13-JAN-20	13-JAN-20	R4968866
Selenium (Se)	<0.20		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Silver (Ag)	0.13		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sodium (Na)	719		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Strontium (Sr)	51.1		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sulfur (S)	<1000		1000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Thallium (Tl)	0.429		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tin (Sn)	<2.0		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Titanium (Ti)	199		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tungsten (W)	<0.50		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Uranium (U)	3.54		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Vanadium (V)	86.0		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zinc (Zn)	113		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zirconium (Zr)	7.3		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
2-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthylene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acridine	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Anthracene	<0.0040		0.0040	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)anthracene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-1 TH19-01 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Chrysene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluorene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Phenanthrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Quinoline	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	09-JAN-20	13-JAN-20	R4967719
IACR (CCME)	<0.15		0.15		09-JAN-20	13-JAN-20	R4967719
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	09-JAN-20	13-JAN-20	R4967719
Surrogate: Acenaphthene d10	109.9		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Chrysene d12	108.3		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Naphthalene d8	113.9		50-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Phenanthrene d10	110.2		60-130	%	09-JAN-20	13-JAN-20	R4967719
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1221	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1232	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1242	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1248	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1254	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1260	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1262	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1268	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Total PCBs	<0.050		0.050	mg/kg		15-JAN-20	R4970310
Surrogate: Decachlorobiphenyl	109.1		65-130	%		15-JAN-20	R4970310
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	10-JAN-20	10-JAN-20	R4966649
F3 (C16-C34)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
F4 (C34-C50)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
Surrogate: 2-Bromobenzotrifluoride	91.3		60-140	%	10-JAN-20	10-JAN-20	R4966649
Chrom. to baseline at nC50	YES				10-JAN-20	10-JAN-20	R4966649
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		17-JAN-20	
F2-Naphth	<25		25	mg/kg		17-JAN-20	
F3-PAH	<50		50	mg/kg		17-JAN-20	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		17-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		17-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Benzene	<0.0050		0.0050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromobenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromochloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromodichloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromoform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
n-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-1 TH19-01 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
sec-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
tert-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon disulfide	<0.25		0.25	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon Tetrachloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromochloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromoethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichlorodifluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichloromethane	0.14		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2,2-Dichloropropane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Ethylbenzene	<0.015		0.015	mg/kg	16-DEC-19	11-JAN-20	R4969007
F1	<10		10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexachlorobutadiene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Isopropylbenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Isopropyltoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
MEK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MIBK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MTBE	<0.20		0.20	mg/kg	16-DEC-19	11-JAN-20	R4969007
Styrene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Tetrachloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Toluene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichlorofluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-1 TH19-01 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Vinyl Chloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
M+P-Xylenes	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
o-Xylene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Surrogate: 1,4-Difluorobenzene (SS)	119.1		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 3,4-Dichlorotoluene (SS)	107.8		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 4-Bromofluorobenzene (SS)	107.3		70-130	%	16-DEC-19	11-JAN-20	R4969007
L2403425-2 TH19-05 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	32.5		0.10	%		09-JAN-20	R4966151
Extractable Organic Halides (EOX)	See Attached					14-JAN-20	R4973593
Metals in Soil by CRC ICPMS							
Aluminum (Al)	26400		5000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Antimony (Sb)	0.43		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Arsenic (As)	8.46		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Barium (Ba)	193		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Beryllium (Be)	1.12		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Boron (B)	19.0		5.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Bismuth (Bi)	0.28		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cadmium (Cd)	0.497		0.020	mg/kg	13-JAN-20	13-JAN-20	R4968866
Calcium (Ca)	15800		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Chromium (Cr)	44.7		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cobalt (Co)	13.7		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Copper (Cu)	35.4		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Iron (Fe)	28300		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lead (Pb)	21.9		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lithium (Li)	27.1		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Magnesium (Mg)	15000		20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Manganese (Mn)	743		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Molybdenum (Mo)	0.55		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Nickel (Ni)	38.1		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Phosphorus (P)	954		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Potassium (K)	6480		100	mg/kg	13-JAN-20	13-JAN-20	R4968866
Selenium (Se)	0.47		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Silver (Ag)	0.14		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sodium (Na)	626		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Strontium (Sr)	55.2		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sulfur (S)	<1000		1000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Thallium (Tl)	0.340		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tin (Sn)	<2.0		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Titanium (Ti)	224		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tungsten (W)	<0.50		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Uranium (U)	1.61		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Vanadium (V)	72.8		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zinc (Zn)	123		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zirconium (Zr)	10.6		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Polyaromatic Hydrocarbons (PAHs)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-2 TH19-05 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.011		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
2-Methyl Naphthalene	0.015		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthene	0.0077		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthylene	0.110		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acridine	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Anthracene	0.0984		0.0040	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)anthracene	0.506		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)pyrene	0.376		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(b&j)fluoranthene	0.810		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(g,h,i)perylene	0.302		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(k)fluoranthene	0.307		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Chrysene	0.646		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Dibenzo(a,h)anthracene	0.0993		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluoranthene	0.660		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluorene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Indeno(1,2,3-cd)pyrene	0.322		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Naphthalene	0.015		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Phenanthrene	0.071		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Pyrene	0.850		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Quinoline	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
B(a)P Total Potency Equivalent	0.680		0.020	mg/kg	09-JAN-20	13-JAN-20	R4967719
IACR (CCME)	10.4		0.15		09-JAN-20	13-JAN-20	R4967719
Benzo(b+j+k)fluoranthene	1.12		0.014	mg/kg	09-JAN-20	13-JAN-20	R4967719
Surrogate: Acenaphthene d10	97.9		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Chrysene d12	112.3		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Naphthalene d8	105.4		50-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Phenanthrene d10	102.5		60-130	%	09-JAN-20	13-JAN-20	R4967719
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1221	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1232	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1242	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1248	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1254	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1260	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1262	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1268	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Total PCBs	<0.050		0.050	mg/kg		15-JAN-20	R4970310
Surrogate: Decachlorobiphenyl	110.4		65-130	%		15-JAN-20	R4970310
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	10-JAN-20	10-JAN-20	R4966649
F3 (C16-C34)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
F4 (C34-C50)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
Surrogate: 2-Bromobenzotrifluoride	92.4		60-140	%	10-JAN-20	10-JAN-20	R4966649
Chrom. to baseline at nC50	YES				10-JAN-20	10-JAN-20	R4966649
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		17-JAN-20	
F2-Naphth	<25		25	mg/kg		17-JAN-20	
F3-PAH	<50		50	mg/kg		17-JAN-20	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		17-JAN-20	
Sum of Xylene Isomer Concentrations							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-2 TH19-05 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		17-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Benzene	<0.0050		0.0050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromobenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromochloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromodichloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromoform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
n-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
sec-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
tert-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon disulfide	<0.25		0.25	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon Tetrachloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromochloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromoethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichlorodifluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2,2-Dichloropropane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Ethylbenzene	<0.015		0.015	mg/kg	16-DEC-19	11-JAN-20	R4969007
F1	<10		10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexachlorobutadiene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Isopropylbenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Isopropyltoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
MEK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MIBK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MTBE	<0.20		0.20	mg/kg	16-DEC-19	11-JAN-20	R4969007
Styrene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-2 TH19-05 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Tetrachloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Toluene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichlorofluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Vinyl Chloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
M+P-Xylenes	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
o-Xylene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Surrogate: 1,4-Difluorobenzene (SS)	121.7		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 3,4-Dichlorotoluene (SS)	129.5		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 4-Bromofluorobenzene (SS)	107.3		70-130	%	16-DEC-19	11-JAN-20	R4969007
L2403425-3 TH19-02 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
BTEX and F1-F4 by Tumbler Method							
BTX plus F1 by GCMS							
Benzene	<0.0050		0.0050	mg/kg	16-DEC-19	11-JAN-20	R4967626
Toluene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4967626
Ethyl benzene	<0.015		0.015	mg/kg	16-DEC-19	11-JAN-20	R4967626
o-Xylene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4967626
m+p-Xylenes	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4967626
F1 (C6-C10)	<10		10	mg/kg	16-DEC-19	11-JAN-20	R4967626
Surrogate: 4-Bromofluorobenzene (SS)	102.5		70-130	%	16-DEC-19	11-JAN-20	R4967626
Surrogate: 3,4-Dichlorotoluene (SS)	129.8		70-130	%	16-DEC-19	11-JAN-20	R4967626
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	10-JAN-20	10-JAN-20	R4966649
F3 (C16-C34)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
F4 (C34-C50)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
Surrogate: 2-Bromobenzotrifluoride	91.4		60-140	%	10-JAN-20	10-JAN-20	R4966649
Chrom. to baseline at nC50	YES				10-JAN-20	10-JAN-20	R4966649
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		15-JAN-20	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		15-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		15-JAN-20	
Miscellaneous Parameters							
Moisture	26.2		0.10	%		09-JAN-20	R4966151
L2403425-4 TH19-09 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	29.6		0.10	%		09-JAN-20	R4966151
Extractable Organic Halides (EOX)	See Attached					14-JAN-20	R4973593

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-4 TH19-09 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Metals in Soil by CRC ICPMS							
Aluminum (Al)	26900		5000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Antimony (Sb)	0.52		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Arsenic (As)	9.35		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Barium (Ba)	199		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Beryllium (Be)	1.34		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Boron (B)	14.4		5.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Bismuth (Bi)	0.34		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cadmium (Cd)	0.077		0.020	mg/kg	13-JAN-20	13-JAN-20	R4968866
Calcium (Ca)	9990		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Chromium (Cr)	48.0		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cobalt (Co)	15.3		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Copper (Cu)	33.1		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Iron (Fe)	32800		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lead (Pb)	16.0		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lithium (Li)	37.2		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Magnesium (Mg)	14200		20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Manganese (Mn)	496		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Molybdenum (Mo)	0.44		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Nickel (Ni)	46.1		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Phosphorus (P)	511		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Potassium (K)	5430		100	mg/kg	13-JAN-20	13-JAN-20	R4968866
Selenium (Se)	<0.20		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Silver (Ag)	0.15		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sodium (Na)	580		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Strontium (Sr)	70.2		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sulfur (S)	<1000		1000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Thallium (Tl)	0.405		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tin (Sn)	<2.0		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Titanium (Ti)	143		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tungsten (W)	<0.50		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Uranium (U)	1.79		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Vanadium (V)	76.9		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zinc (Zn)	84.1		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zirconium (Zr)	9.0		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
2-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthylene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acridine	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Anthracene	<0.0040		0.0040	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)anthracene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Chrysene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluorene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-4 TH19-09 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Phenanthrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Quinoline	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	09-JAN-20	13-JAN-20	R4967719
IACR (CCME)	<0.15		0.15		09-JAN-20	13-JAN-20	R4967719
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	09-JAN-20	13-JAN-20	R4967719
Surrogate: Acenaphthene d10	105.4		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Chrysene d12	112.4		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Naphthalene d8	108.6		50-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Phenanthrene d10	108.1		60-130	%	09-JAN-20	13-JAN-20	R4967719
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1221	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1232	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1242	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1248	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1254	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1260	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1262	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1268	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Total PCBs	<0.050		0.050	mg/kg		15-JAN-20	R4970310
Surrogate: Decachlorobiphenyl	99.5		65-130	%		15-JAN-20	R4970310
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	10-JAN-20	10-JAN-20	R4966649
F3 (C16-C34)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
F4 (C34-C50)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
Surrogate: 2-Bromobenzotrifluoride	87.9		60-140	%	10-JAN-20	10-JAN-20	R4966649
Chrom. to baseline at nC50	YES				10-JAN-20	10-JAN-20	R4966649
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		17-JAN-20	
F2-Naphth	<25		25	mg/kg		17-JAN-20	
F3-PAH	<50		50	mg/kg		17-JAN-20	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		17-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		17-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Benzene	<0.0050		0.0050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromobenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromochloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromodichloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromoform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
n-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
sec-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
tert-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon disulfide	<0.25		0.25	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon Tetrachloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-4 TH19-09 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Chloroform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromochloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromoethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichlorodifluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2,2-Dichloropropane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Ethylbenzene	<0.015		0.015	mg/kg	16-DEC-19	11-JAN-20	R4969007
F1	<10		10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexachlorobutadiene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Isopropylbenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Isopropyltoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
MEK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MIBK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MTBE	<0.20		0.20	mg/kg	16-DEC-19	11-JAN-20	R4969007
Styrene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Tetrachloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Toluene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichlorofluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Vinyl Chloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
M+P-Xylenes	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
o-Xylene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-4 TH19-09 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Surrogate: 1,4-Difluorobenzene (SS)	117.4		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 3,4-Dichlorotoluene (SS)	119.3		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 4-Bromofluorobenzene (SS)	105.8		70-130	%	16-DEC-19	11-JAN-20	R4969007
L2403425-5 TH19-06 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	25.5		0.10	%		09-JAN-20	R4966151
Extractable Organic Halides (EOX)	See Attached					14-JAN-20	R4973593
Metals in Soil by CRC ICPMS							
Aluminum (Al)	22900		5000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Antimony (Sb)	0.42		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Arsenic (As)	7.24		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Barium (Ba)	212		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Beryllium (Be)	0.89		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Boron (B)	18.6		5.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Bismuth (Bi)	0.24		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cadmium (Cd)	0.318		0.020	mg/kg	13-JAN-20	13-JAN-20	R4968866
Calcium (Ca)	65600		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Chromium (Cr)	38.7		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cobalt (Co)	12.0		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Copper (Cu)	27.9		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Iron (Fe)	25500		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lead (Pb)	18.7		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lithium (Li)	26.3		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Magnesium (Mg)	27800		20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Manganese (Mn)	581		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Molybdenum (Mo)	0.49		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Nickel (Ni)	34.6		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Phosphorus (P)	537		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Potassium (K)	4060		100	mg/kg	13-JAN-20	13-JAN-20	R4968866
Selenium (Se)	0.25		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Silver (Ag)	0.12		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sodium (Na)	279		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Strontium (Sr)	94.2		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sulfur (S)	<1000		1000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Thallium (Tl)	0.285		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tin (Sn)	<2.0		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Titanium (Ti)	224		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tungsten (W)	<0.50		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Uranium (U)	1.30		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Vanadium (V)	65.6		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zinc (Zn)	90.3		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zirconium (Zr)	5.9		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
2-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthylene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acridine	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Anthracene	0.0098		0.0040	mg/kg	09-JAN-20	13-JAN-20	R4967719

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-5 TH19-06 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(a)anthracene	0.030		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)pyrene	0.022		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(b&j)fluoranthene	0.038		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(g,h,i)perylene	0.021		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(k)fluoranthene	0.016		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Chrysene	0.041		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluoranthene	0.058		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluorene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Indeno(1,2,3-cd)pyrene	0.021		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Phenanthrene	0.032		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Pyrene	0.057		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Quinoline	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
B(a)P Total Potency Equivalent	0.035		0.020	mg/kg	09-JAN-20	13-JAN-20	R4967719
IACR (CCME)	0.53		0.15		09-JAN-20	13-JAN-20	R4967719
Benzo(b+j+k)fluoranthene	0.054		0.014	mg/kg	09-JAN-20	13-JAN-20	R4967719
Surrogate: Acenaphthene d10	108.7		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Chrysene d12	119.0		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Naphthalene d8	111.1		50-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Phenanthrene d10	109.3		60-130	%	09-JAN-20	13-JAN-20	R4967719
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1221	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1232	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1242	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1248	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1254	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1260	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1262	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1268	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Total PCBs	<0.050		0.050	mg/kg		15-JAN-20	R4970310
Surrogate: Decachlorobiphenyl	113.0		65-130	%		15-JAN-20	R4970310
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	10-JAN-20	10-JAN-20	R4966649
F3 (C16-C34)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
F4 (C34-C50)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
Surrogate: 2-Bromobenzotrifluoride	91.0		60-140	%	10-JAN-20	10-JAN-20	R4966649
Chrom. to baseline at nC50	YES				10-JAN-20	10-JAN-20	R4966649
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		17-JAN-20	
F2-Naphth	<25		25	mg/kg		17-JAN-20	
F3-PAH	<50		50	mg/kg		17-JAN-20	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		17-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		17-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Benzene	<0.0050		0.0050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromobenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromochloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-5 TH19-06 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Bromodichloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromoform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Bromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
n-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
sec-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
tert-Butylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon disulfide	<0.25		0.25	mg/kg	16-DEC-19	11-JAN-20	R4969007
Carbon Tetrachloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloroform	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Chloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Chlorotoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromochloromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dibromoethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dibromomethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichlorodifluoromethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Dichloromethane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3-Dichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2,2-Dichloropropane	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Ethylbenzene	<0.015		0.015	mg/kg	16-DEC-19	11-JAN-20	R4969007
F1	<10		10	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexachlorobutadiene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Hexane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
Isopropylbenzene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
4-Isopropyltoluene	<0.10		0.10	mg/kg	16-DEC-19	11-JAN-20	R4969007
MEK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MIBK	<0.50		0.50	mg/kg	16-DEC-19	11-JAN-20	R4969007
MTBE	<0.20		0.20	mg/kg	16-DEC-19	11-JAN-20	R4969007
Styrene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Tetrachloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Toluene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-5 TH19-06 @ 0.8M							
Sampled By: CLIENT on 16-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichloroethene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Trichlorofluoromethane	0.144		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Vinyl Chloride	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
M+P-Xylenes	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
o-Xylene	<0.050		0.050	mg/kg	16-DEC-19	11-JAN-20	R4969007
Surrogate: 1,4-Difluorobenzene (SS)	119.7		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 3,4-Dichlorotoluene (SS)	127.2		70-130	%	16-DEC-19	11-JAN-20	R4969007
Surrogate: 4-Bromofluorobenzene (SS)	106.1		70-130	%	16-DEC-19	11-JAN-20	R4969007
L2403425-6 TH19-11 @ 1.5M							
Sampled By: CLIENT on 20-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	25.3		0.10	%		09-JAN-20	R4966151
Metals in Soil by CRC ICPMS							
Aluminum (Al)	23600		5000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Antimony (Sb)	0.32		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Arsenic (As)	7.04		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Barium (Ba)	194		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Beryllium (Be)	0.98		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Boron (B)	17.5		5.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Bismuth (Bi)	0.25		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cadmium (Cd)	0.359		0.020	mg/kg	13-JAN-20	13-JAN-20	R4968866
Calcium (Ca)	58500		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Chromium (Cr)	41.1		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Cobalt (Co)	12.3		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Copper (Cu)	28.0		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Iron (Fe)	27600		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lead (Pb)	12.2		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Lithium (Li)	31.7		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Magnesium (Mg)	25700		20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Manganese (Mn)	807		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Molybdenum (Mo)	0.25		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Nickel (Ni)	36.6		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Phosphorus (P)	516		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Potassium (K)	4160		100	mg/kg	13-JAN-20	13-JAN-20	R4968866
Selenium (Se)	0.21		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866
Silver (Ag)	0.11		0.10	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sodium (Na)	397		50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Strontium (Sr)	105		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Sulfur (S)	<1000		1000	mg/kg	13-JAN-20	13-JAN-20	R4968866
Thallium (Tl)	0.330		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tin (Sn)	<2.0		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Titanium (Ti)	212		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Tungsten (W)	<0.50		0.50	mg/kg	13-JAN-20	13-JAN-20	R4968866
Uranium (U)	2.62		0.050	mg/kg	13-JAN-20	13-JAN-20	R4968866
Vanadium (V)	66.7		0.20	mg/kg	13-JAN-20	13-JAN-20	R4968866

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-6 TH19-11 @ 1.5M							
Sampled By: CLIENT on 20-DEC-19							
Matrix: SOIL							
Metals in Soil by CRC ICPMS							
Zinc (Zn)	80.5		2.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Zirconium (Zr)	6.1		1.0	mg/kg	13-JAN-20	13-JAN-20	R4968866
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
2-Methyl Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acenaphthylene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Acridine	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Anthracene	<0.0040		0.0040	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)anthracene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(a)pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Chrysene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluoranthene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Fluorene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Naphthalene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Phenanthrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Pyrene	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
Quinoline	<0.010		0.010	mg/kg	09-JAN-20	13-JAN-20	R4967719
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	09-JAN-20	13-JAN-20	R4967719
IACR (CCME)	<0.15		0.15		09-JAN-20	13-JAN-20	R4967719
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	09-JAN-20	13-JAN-20	R4967719
Surrogate: Acenaphthene d10	104.1		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Chrysene d12	113.3		60-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Naphthalene d8	107.7		50-130	%	09-JAN-20	13-JAN-20	R4967719
Surrogate: Phenanthrene d10	107.7		60-130	%	09-JAN-20	13-JAN-20	R4967719
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1221	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1232	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1242	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1248	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1254	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1260	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1262	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Aroclor 1268	<0.010		0.010	mg/kg		15-JAN-20	R4970310
Total PCBs	<0.050		0.050	mg/kg		15-JAN-20	R4970310
Surrogate: Decachlorobiphenyl	113.5		65-130	%		15-JAN-20	R4970310
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	10-JAN-20	10-JAN-20	R4966649
F3 (C16-C34)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
F4 (C34-C50)	<50		50	mg/kg	10-JAN-20	10-JAN-20	R4966649
Surrogate: 2-Bromobenzotrifluoride	88.4		60-140	%	10-JAN-20	10-JAN-20	R4966649
Chrom. to baseline at nC50	YES				10-JAN-20	10-JAN-20	R4966649
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		17-JAN-20	
F2-Naphth	<25		25	mg/kg		17-JAN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-6 TH19-11 @ 1.5M							
Sampled By: CLIENT on 20-DEC-19							
Matrix: SOIL							
CCME Total Hydrocarbons							
F3-PAH	<50		50	mg/kg		17-JAN-20	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		17-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		17-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	20-DEC-19	11-JAN-20	R4969007
Benzene	<0.0050		0.0050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Bromobenzene	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
Bromochloromethane	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
Bromodichloromethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Bromoform	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Bromomethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
n-Butylbenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
sec-Butylbenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
tert-Butylbenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Carbon disulfide	<0.25		0.25	mg/kg	20-DEC-19	11-JAN-20	R4969007
Carbon Tetrachloride	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Chlorobenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Chloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Chloroform	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Chloromethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
2-Chlorotoluene	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
4-Chlorotoluene	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
Dibromochloromethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2-Dibromoethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Dibromomethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Dichlorodifluoromethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1-dichloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2-Dichloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1-dichloroethene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Dichloromethane	0.18		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2-Dichloropropane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,3-Dichloropropane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
2,2-Dichloropropane	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1-Dichloropropene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Ethylbenzene	<0.015		0.015	mg/kg	20-DEC-19	11-JAN-20	R4969007
F1	<10		10	mg/kg	20-DEC-19	11-JAN-20	R4969007
Hexachlorobutadiene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Hexane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	20-DEC-19	11-JAN-20	R4969007
Isopropylbenzene	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
4-Isopropyltoluene	<0.10		0.10	mg/kg	20-DEC-19	11-JAN-20	R4969007
MEK	<0.50		0.50	mg/kg	20-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403425-6 TH19-11 @ 1.5M							
Sampled By: CLIENT on 20-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
MIBK	<0.50		0.50	mg/kg	20-DEC-19	11-JAN-20	R4969007
MTBE	<0.20		0.20	mg/kg	20-DEC-19	11-JAN-20	R4969007
Styrene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Tetrachloroethene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Toluene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Trichloroethene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Trichlorofluoromethane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Vinyl Chloride	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
M+P-Xylenes	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
o-Xylene	<0.050		0.050	mg/kg	20-DEC-19	11-JAN-20	R4969007
Surrogate: 1,4-Difluorobenzene (SS)	109.2		70-130	%	20-DEC-19	11-JAN-20	R4969007
Surrogate: 3,4-Dichlorotoluene (SS)	110.8		70-130	%	20-DEC-19	11-JAN-20	R4969007
Surrogate: 4-Bromofluorobenzene (SS)	97.7		70-130	%	20-DEC-19	11-JAN-20	R4969007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTEXS+F1-HSMS-WP	Soil	BTX plus F1 by GCMS	EPA 8260C

The soil methanol extract is added to water and reagents, then heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

EOX-MP	Misc.	Extractable Organic Halides (EOX)	SEE SUBLET LAB REPORT

The material is extracted with ethyl acetate then the extract is analyzed on the TOX (Total Organic Halides) instrument.

F1-F4-CALC-WP	Soil	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-TMB-FID-WP	Soil	CCME Total Extractable Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001

A soil or sediment sample is extracted with 1:1 hexane/acetone in a tumbler, followed by a silica gel clean up to facilitate separation of the hydrocarbons from other polar extractions. An aliquot of the solvent is analyzed using a gas chromatograph equipped with a flame -ionization detector.

MET-200.2-CCMS-WP	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020B (mod)

Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.

Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.

MOISTURE-WP	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)

Moisture content in solid matrices is determined gravimetrically after drying to constant weight at 105°C.

PAH,PANH-WP	Soil	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Samples are rotary extracted using a 1:1 mixture of acetone and dichloromethane. Extracts are concentrated and solvent exchanged to toluene. The toluene extract is analyzed by GCMS.

PCB-ED	Soil	PCBs	EPA 3570/8082-GC-ECD

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PSA-75UM-SIEVE-WP	Soil	% Particles > 75um (Coarse/Fine)	ASTM D422-63

An air-dried sample is reduced to < 2 mm size and mixed with a dispersing agent (Calgon solution). The sample is washed through a 200 mesh (75 µm) sieve. The retained weight of sample is used to determine % sand fraction.

VOC+F1-HSMS-WP	Soil	VOC plus F1 by GCMS	EPA 8260C

The soil methanol extract is added to water and reagents, then heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

XYLENES-SUM-CALC-WP	Soil	Sum of Xylene Isomer Concentrations	CALCULATED RESULT

Total xylenes represents the sum of o-xylene and m&p-xylene.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
MP	ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2403425 Report Date: 21-JAN-20

Client: Wood Environment & Infrastructure Solutions (Winnipeg)
440 Dovercourt Drive
Winnipeg MB R3Y 1G4
Contact: KEVIN BEECHINOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	**Soil**							
Batch R4967626								
WG3255738-4 DUP		**L2403425-3**						
Benzene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	11-JAN-20
Toluene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	11-JAN-20
Ethyl benzene		<0.015	<0.015	RPD-NA	mg/kg	N/A	50	11-JAN-20
o-Xylene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	11-JAN-20
m+p-Xylenes		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	11-JAN-20
F1 (C6-C10)		<10	<10	RPD-NA	mg/kg	N/A	50	11-JAN-20
WG3255738-2 LCS								
Benzene			100.3		%		70-130	11-JAN-20
Toluene			92.2		%		70-130	11-JAN-20
Ethyl benzene			99.1		%		70-130	11-JAN-20
o-Xylene			104.0		%		70-130	11-JAN-20
m+p-Xylenes			107.1		%		70-130	11-JAN-20
WG3255738-3 LCS								
F1 (C6-C10)			75.2		%		70-130	11-JAN-20
WG3255738-1 MB								
Benzene			<0.0050		mg/kg		0.005	11-JAN-20
Toluene			<0.050		mg/kg		0.05	11-JAN-20
Ethyl benzene			<0.015		mg/kg		0.015	11-JAN-20
o-Xylene			<0.050		mg/kg		0.05	11-JAN-20
m+p-Xylenes			<0.050		mg/kg		0.05	11-JAN-20
F1 (C6-C10)			<10		mg/kg		10	11-JAN-20
Surrogate: 4-Bromofluorobenzene (SS)			84.3		%		70-130	11-JAN-20
Surrogate: 3,4-Dichlorotoluene (SS)			106.6		%		70-130	11-JAN-20
F2-F4-TMB-FID-WP	**Soil**							
Batch R4966649								
WG3256223-3 IRM		**ALS PHC RM3**						
F2 (C10-C16)			96.7		%		70-130	10-JAN-20
F3 (C16-C34)			99.0		%		70-130	10-JAN-20
F4 (C34-C50)			107.7		%		70-130	10-JAN-20
WG3256223-2 LCS								
F2 (C10-C16)			98.7		%		70-130	10-JAN-20
F3 (C16-C34)			92.2		%		70-130	10-JAN-20
F4 (C34-C50)			101.1		%		70-130	10-JAN-20
WG3256223-1 MB								
F2 (C10-C16)			<25		mg/kg		25	10-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-TMB-FID-WP	**Soil**							
Batch R4966649								
WG3256223-1 MB								
F3 (C16-C34)			<50		mg/kg		50	10-JAN-20
F4 (C34-C50)			<50		mg/kg		50	10-JAN-20
Surrogate: 2-Bromobenzotrifluoride			95.8		%		60-140	10-JAN-20
MET-200.2-CCMS-WP	**Soil**							
Batch R4968866								
WG3256934-4 CRM		**CANMET TILL-1**						
Aluminum (Al)			102.2		%		70-130	13-JAN-20
Antimony (Sb)			107.5		%		70-130	13-JAN-20
Arsenic (As)			101.3		%		70-130	13-JAN-20
Barium (Ba)			99.7		%		70-130	13-JAN-20
Beryllium (Be)			112.1		%		70-130	13-JAN-20
Boron (B)			4.4		mg/kg		0-8.2	13-JAN-20
Bismuth (Bi)			112.3		%		70-130	13-JAN-20
Cadmium (Cd)			101.7		%		70-130	13-JAN-20
Calcium (Ca)			94.6		%		70-130	13-JAN-20
Chromium (Cr)			94.1		%		70-130	13-JAN-20
Cobalt (Co)			98.4		%		70-130	13-JAN-20
Copper (Cu)			102.7		%		70-130	13-JAN-20
Iron (Fe)			97.6		%		70-130	13-JAN-20
Lead (Pb)			112.8		%		70-130	13-JAN-20
Lithium (Li)			108.3		%		70-130	13-JAN-20
Magnesium (Mg)			105.2		%		70-130	13-JAN-20
Manganese (Mn)			104.0		%		70-130	13-JAN-20
Molybdenum (Mo)			101.6		%		70-130	13-JAN-20
Nickel (Ni)			97.0		%		70-130	13-JAN-20
Phosphorus (P)			97.4		%		70-130	13-JAN-20
Potassium (K)			82.5		%		70-130	13-JAN-20
Selenium (Se)			0.32		mg/kg		0.12-0.52	13-JAN-20
Silver (Ag)			0.24		mg/kg		0.12-0.32	13-JAN-20
Sodium (Na)			84.1		%		70-130	13-JAN-20
Strontium (Sr)			95.1		%		70-130	13-JAN-20
Thallium (Tl)			0.138		mg/kg		0.075-0.175	13-JAN-20
Tin (Sn)			0.8		mg/kg		0-3.1	13-JAN-20
Titanium (Ti)			81.5		%		70-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4968866								
WG3256934-4 CRM		**CANMET TILL-1**						
Tungsten (W)			0.16		mg/kg		0-0.66	13-JAN-20
Uranium (U)			112.9		%		70-130	13-JAN-20
Vanadium (V)			92.3		%		70-130	13-JAN-20
Zinc (Zn)			97.8		%		70-130	13-JAN-20
Zirconium (Zr)			0.7		mg/kg		0-1.8	13-JAN-20
WG3256934-2 LCS								
Aluminum (Al)			102.5		%		80-120	13-JAN-20
Antimony (Sb)			104.6		%		80-120	13-JAN-20
Arsenic (As)			102.1		%		80-120	13-JAN-20
Barium (Ba)			100.7		%		80-120	13-JAN-20
Beryllium (Be)			109.7		%		80-120	13-JAN-20
Boron (B)			111.1		%		80-120	13-JAN-20
Bismuth (Bi)			107.2		%		80-120	13-JAN-20
Cadmium (Cd)			103.2		%		80-120	13-JAN-20
Calcium (Ca)			103.2		%		80-120	13-JAN-20
Chromium (Cr)			104.9		%		80-120	13-JAN-20
Cobalt (Co)			103.3		%		80-120	13-JAN-20
Copper (Cu)			103.5		%		80-120	13-JAN-20
Iron (Fe)			94.2		%		80-120	13-JAN-20
Lead (Pb)			108.3		%		80-120	13-JAN-20
Lithium (Li)			112.5		%		80-120	13-JAN-20
Magnesium (Mg)			117.7		%		80-120	13-JAN-20
Manganese (Mn)			101.2		%		80-120	13-JAN-20
Molybdenum (Mo)			102.7		%		80-120	13-JAN-20
Nickel (Ni)			101.0		%		80-120	13-JAN-20
Phosphorus (P)			106.6		%		80-120	13-JAN-20
Potassium (K)			100.8		%		80-120	13-JAN-20
Selenium (Se)			113.0		%		80-120	13-JAN-20
Silver (Ag)			101.7		%		80-120	13-JAN-20
Sodium (Na)			106.0		%		80-120	13-JAN-20
Strontium (Sr)			102.9		%		80-120	13-JAN-20
Sulfur (S)			117.4		%		70-130	13-JAN-20
Thallium (Tl)			105.1		%		80-120	13-JAN-20
Tin (Sn)			102.7		%		80-120	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4968866								
WG3256934-2 LCS								
Titanium (Ti)			97.5		%		80-120	13-JAN-20
Tungsten (W)			108.5		%		70-130	13-JAN-20
Uranium (U)			115.9		%		80-120	13-JAN-20
Vanadium (V)			103.2		%		80-120	13-JAN-20
Zinc (Zn)			102.6		%		80-120	13-JAN-20
Zirconium (Zr)			98.4		%		80-120	13-JAN-20
WG3256934-1 MB								
Aluminum (Al)			<50		mg/kg		50	13-JAN-20
Antimony (Sb)			<0.10		mg/kg		0.1	13-JAN-20
Arsenic (As)			<0.10		mg/kg		0.1	13-JAN-20
Barium (Ba)			<0.50		mg/kg		0.5	13-JAN-20
Beryllium (Be)			<0.10		mg/kg		0.1	13-JAN-20
Boron (B)			<5.0		mg/kg		5	13-JAN-20
Bismuth (Bi)			<0.20		mg/kg		0.2	13-JAN-20
Cadmium (Cd)			<0.020		mg/kg		0.02	13-JAN-20
Calcium (Ca)			<50		mg/kg		50	13-JAN-20
Chromium (Cr)			<0.50		mg/kg		0.5	13-JAN-20
Cobalt (Co)			<0.10		mg/kg		0.1	13-JAN-20
Copper (Cu)			<0.50		mg/kg		0.5	13-JAN-20
Iron (Fe)			<50		mg/kg		50	13-JAN-20
Lead (Pb)			<0.50		mg/kg		0.5	13-JAN-20
Lithium (Li)			<2.0		mg/kg		2	13-JAN-20
Magnesium (Mg)			<20		mg/kg		20	13-JAN-20
Manganese (Mn)			<1.0		mg/kg		1	13-JAN-20
Molybdenum (Mo)			<0.10		mg/kg		0.1	13-JAN-20
Nickel (Ni)			<0.50		mg/kg		0.5	13-JAN-20
Phosphorus (P)			<50		mg/kg		50	13-JAN-20
Potassium (K)			<100		mg/kg		100	13-JAN-20
Selenium (Se)			<0.20		mg/kg		0.2	13-JAN-20
Silver (Ag)			<0.10		mg/kg		0.1	13-JAN-20
Sodium (Na)			<50		mg/kg		50	13-JAN-20
Strontium (Sr)			<0.50		mg/kg		0.5	13-JAN-20
Sulfur (S)			<1000		mg/kg		1000	13-JAN-20
Thallium (Tl)			<0.050		mg/kg		0.05	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4968866								
WG3256934-1 MB								
Tin (Sn)			<2.0		mg/kg		2	13-JAN-20
Titanium (Ti)			<1.0		mg/kg		1	13-JAN-20
Tungsten (W)			<0.50		mg/kg		0.5	13-JAN-20
Uranium (U)			<0.050		mg/kg		0.05	13-JAN-20
Vanadium (V)			<0.20		mg/kg		0.2	13-JAN-20
Zinc (Zn)			<2.0		mg/kg		2	13-JAN-20
Zirconium (Zr)			<1.0		mg/kg		1	13-JAN-20
MOISTURE-WP	**Soil**							
Batch R4966151								
WG3255124-2 LCS								
Moisture			100.3		%		90-110	09-JAN-20
WG3255124-1 MB								
Moisture			<0.10		%		0.1	09-JAN-20
PAH,PANH-WP	**Soil**							
Batch R4967719								
WG3256667-3 DUP		**L2403425-1**						
1-Methyl Naphthalene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
2-Methyl Naphthalene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Acenaphthene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	13-JAN-20
Acenaphthylene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	13-JAN-20
Acridine		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Anthracene		<0.0040	<0.0040	RPD-NA	mg/kg	N/A	50	13-JAN-20
Benzo(a)anthracene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Benzo(a)pyrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Benzo(b&j)fluoranthene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Benzo(g,h,i)perylene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Benzo(k)fluoranthene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Chrysene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Dibenzo(a,h)anthracene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	13-JAN-20
Fluoranthene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Fluorene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Indeno(1,2,3-cd)pyrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Naphthalene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Phenanthrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
Pyrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Soil**							
Batch R4967719								
WG3256667-3 DUP		**L2403425-1**						
Quinoline		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	13-JAN-20
WG3256667-4 IRM		**ALS PAH RM2**						
1-Methyl Naphthalene			115.6		%		65-130	13-JAN-20
2-Methyl Naphthalene			122.1		%		65-130	13-JAN-20
Acenaphthene			114.8		%		65-130	13-JAN-20
Acenaphthylene			97.1		%		65-130	13-JAN-20
Anthracene			101.7		%		65-130	13-JAN-20
Benzo(a)anthracene			101.6		%		65-130	13-JAN-20
Benzo(a)pyrene			74.1		%		65-130	13-JAN-20
Benzo(b&j)fluoranthene			86.4		%		65-130	13-JAN-20
Benzo(g,h,i)perylene			79.4		%		65-130	13-JAN-20
Benzo(k)fluoranthene			91.7		%		65-130	13-JAN-20
Chrysene			96.5		%		65-130	13-JAN-20
Dibenzo(a,h)anthracene			93.9		%		65-130	13-JAN-20
Fluoranthene			106.0		%		65-130	13-JAN-20
Fluorene			103.6		%		65-130	13-JAN-20
Indeno(1,2,3-cd)pyrene			75.6		%		65-130	13-JAN-20
Naphthalene			127.8		%		65-130	13-JAN-20
Phenanthrene			106.3		%		65-130	13-JAN-20
Pyrene			108.4		%		65-130	13-JAN-20
WG3256667-2 LCS								
1-Methyl Naphthalene			118.1		%		60-130	13-JAN-20
2-Methyl Naphthalene			111.7		%		60-130	13-JAN-20
Acenaphthene			117.0		%		60-130	13-JAN-20
Acenaphthylene			106.7		%		60-130	13-JAN-20
Acridine			115.4		%		60-130	13-JAN-20
Anthracene			110.4		%		60-130	13-JAN-20
Benzo(a)anthracene			112.8		%		60-130	13-JAN-20
Benzo(a)pyrene			106.7		%		60-130	13-JAN-20
Benzo(b&j)fluoranthene			110.6		%		60-130	13-JAN-20
Benzo(g,h,i)perylene			108.0		%		60-130	13-JAN-20
Benzo(k)fluoranthene			114.5		%		60-130	13-JAN-20
Chrysene			111.1		%		60-130	13-JAN-20
Dibenzo(a,h)anthracene			106.3		%		60-130	13-JAN-20
Fluoranthene			112.7		%		60-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Soil**							
Batch R4967719								
WG3256667-2 LCS								
Fluorene			107.6		%		60-130	13-JAN-20
Indeno(1,2,3-cd)pyrene			102.6		%		60-130	13-JAN-20
Naphthalene			108.9		%		50-130	13-JAN-20
Phenanthrene			119.2		%		60-130	13-JAN-20
Pyrene			115.4		%		60-130	13-JAN-20
Quinoline			107.3		%		60-130	13-JAN-20
WG3256667-1 MB								
1-Methyl Naphthalene			<0.010		mg/kg		0.01	13-JAN-20
2-Methyl Naphthalene			<0.010		mg/kg		0.01	13-JAN-20
Acenaphthene			<0.0050		mg/kg		0.005	13-JAN-20
Acenaphthylene			<0.0050		mg/kg		0.005	13-JAN-20
Acridine			<0.010		mg/kg		0.01	13-JAN-20
Anthracene			<0.0040		mg/kg		0.004	13-JAN-20
Benzo(a)anthracene			<0.010		mg/kg		0.01	13-JAN-20
Benzo(a)pyrene			<0.010		mg/kg		0.01	13-JAN-20
Benzo(b&j)fluoranthene			<0.010		mg/kg		0.01	13-JAN-20
Benzo(g,h,i)perylene			<0.010		mg/kg		0.01	13-JAN-20
Benzo(k)fluoranthene			<0.010		mg/kg		0.01	13-JAN-20
Chrysene			<0.010		mg/kg		0.01	13-JAN-20
Dibenzo(a,h)anthracene			<0.0050		mg/kg		0.005	13-JAN-20
Fluoranthene			<0.010		mg/kg		0.01	13-JAN-20
Fluorene			<0.010		mg/kg		0.01	13-JAN-20
Indeno(1,2,3-cd)pyrene			<0.010		mg/kg		0.01	13-JAN-20
Naphthalene			<0.010		mg/kg		0.01	13-JAN-20
Phenanthrene			<0.010		mg/kg		0.01	13-JAN-20
Pyrene			<0.010		mg/kg		0.01	13-JAN-20
Quinoline			<0.010		mg/kg		0.01	13-JAN-20
Surrogate: Acenaphthene d10			101.2		%		60-130	13-JAN-20
Surrogate: Chrysene d12			105.4		%		60-130	13-JAN-20
Surrogate: Naphthalene d8			105.8		%		50-130	13-JAN-20
Surrogate: Phenanthrene d10			104.8		%		60-130	13-JAN-20
PCB-ED	**Soil**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-ED	**Soil**							
Batch R4970310								
WG3256620-3 CRM		**PCB_SOIL_CRM915-050**						
Aroclor 1260			89.2		%		65-130	15-JAN-20
WG3256620-4 DUP		**L2403425-6**						
Aroclor 1016		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1221		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1232		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1242		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1248		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1254		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1260		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1262		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
Aroclor 1268		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	15-JAN-20
WG3256620-2 LCS		**LCS_A1268**						
Aroclor 1268			98.8		%		65-130	15-JAN-20
WG3256620-1 MB								
Aroclor 1016			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1221			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1232			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1242			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1248			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1254			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1260			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1262			<0.010		mg/kg		0.01	15-JAN-20
Aroclor 1268			<0.010		mg/kg		0.01	15-JAN-20
Surrogate: Decachlorobiphenyl			96.8		%		65-130	15-JAN-20
PSA-75UM-SIEVE-WP	**Soil**							
Batch R4973298								
WG3260576-1 IRM		**SRS-1704**						
% >75um			68.1		%		65.7-75.7	16-JAN-20
VOC+F1-HSMS-WP	**Soil**							
Batch R4969007								
WG3255736-2 LCS								
Acetone			117.7		%		70-130	10-JAN-20
Benzene			89.2		%		70-130	10-JAN-20
Bromobenzene			92.0		%		70-130	10-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4969007								
WG3255736-2 LCS								
Bromochloromethane			95.6		%		70-130	10-JAN-20
Bromodichloromethane			91.5		%		70-130	10-JAN-20
Bromoform			98.9		%		70-130	10-JAN-20
Bromomethane			113.7		%		60-140	10-JAN-20
n-Butylbenzene			86.3		%		70-130	10-JAN-20
sec-Butylbenzene			90.9		%		70-130	10-JAN-20
tert-Butylbenzene			92.5		%		70-130	10-JAN-20
Carbon disulfide			101.7		%		70-130	10-JAN-20
Carbon Tetrachloride			80.2		%		70-130	10-JAN-20
Chlorobenzene			91.3		%		70-130	10-JAN-20
Chloroethane			99.5		%		60-140	10-JAN-20
Chloroform			87.8		%		70-130	10-JAN-20
Chloromethane			185.8	RRQC	%		60-140	10-JAN-20
2-Chlorotoluene			96.5		%		70-130	10-JAN-20
4-Chlorotoluene			94.3		%		70-130	10-JAN-20
Dibromochloromethane			96.8		%		70-130	10-JAN-20
1,2-Dibromo-3-chloropropane			106.6		%		70-130	10-JAN-20
1,2-Dibromoethane			103.1		%		70-130	10-JAN-20
Dibromomethane			101.6		%		70-130	10-JAN-20
1,2-Dichlorobenzene			90.1		%		70-130	10-JAN-20
1,3-Dichlorobenzene			84.9		%		70-130	10-JAN-20
1,4-Dichlorobenzene			90.1		%		70-130	10-JAN-20
Dichlorodifluoromethane			263.3	RRQC	%		60-140	10-JAN-20
1,1-dichloroethane			88.3		%		70-130	10-JAN-20
1,2-Dichloroethane			98.2		%		70-130	10-JAN-20
1,1-dichloroethene			87.2		%		70-130	10-JAN-20
cis-1,2-Dichloroethene			90.8		%		70-130	10-JAN-20
trans-1,2-Dichloroethene			85.8		%		70-130	10-JAN-20
Dichloromethane			94.7		%		60-140	10-JAN-20
1,2-Dichloropropane			87.0		%		70-130	10-JAN-20
1,3-Dichloropropane			101.0		%		70-130	10-JAN-20
2,2-Dichloropropane			92.4		%		70-130	10-JAN-20
1,1-Dichloropropene			84.0		%		70-130	10-JAN-20
cis-1,3-Dichloropropene			96.7		%		70-130	10-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4969007								
WG3255736-2 LCS								
trans-1,3-Dichloropropene			98.7		%		70-130	10-JAN-20
Ethylbenzene			90.4		%		70-130	10-JAN-20
Hexachlorobutadiene			76.6		%		70-130	10-JAN-20
Hexane			74.2		%		70-130	10-JAN-20
2-Hexanone (Methyl butyl ketone)			124.2		%		70-130	10-JAN-20
Isopropylbenzene			92.3		%		70-130	10-JAN-20
4-Isopropyltoluene			90.8		%		70-130	10-JAN-20
MEK			121.3		%		70-130	10-JAN-20
MIBK			124.5		%		70-130	10-JAN-20
MTBE			91.4		%		70-130	10-JAN-20
Styrene			99.8		%		70-130	10-JAN-20
1,1,1,2-Tetrachloroethane			89.6		%		70-130	10-JAN-20
1,1,2,2-Tetrachloroethane			104.8		%		70-130	10-JAN-20
Tetrachloroethene			76.7		%		70-130	10-JAN-20
Toluene			90.3		%		70-130	10-JAN-20
1,2,3-Trichlorobenzene			91.4		%		70-130	10-JAN-20
1,2,4-Trichlorobenzene			76.1		%		70-130	10-JAN-20
1,1,1-Trichloroethane			85.3		%		70-130	10-JAN-20
1,1,2-Trichloroethane			101.5		%		70-130	10-JAN-20
Trichloroethene			82.7		%		70-130	10-JAN-20
Trichlorofluoromethane			79.9		%		60-140	10-JAN-20
1,2,3-Trichloropropane			102.6		%		70-130	10-JAN-20
1,2,4-Trimethylbenzene			93.8		%		70-130	10-JAN-20
1,3,5-Trimethylbenzene			93.0		%		70-130	10-JAN-20
Vinyl Chloride			136.4	RRQC	%		60-140	10-JAN-20
M+P-Xylenes			96.4		%		70-130	10-JAN-20
o-Xylene			93.2		%		70-130	10-JAN-20
COMMENTS: % Recovery for Dichlorodifluromethane, Chloromethane & Vinyl Chloride are hogher than our Data Quality OObjective (DQO). Sample results are not affected as results for these compounds are less than our Limit of Reporting (LOR)								
WG3255736-4 LCS								
F1			114.2		%		70-130	10-JAN-20
WG3255736-1 MB								
Acetone			<0.50		mg/kg		0.5	10-JAN-20
Benzene			<0.0050		mg/kg		0.005	10-JAN-20
Bromobenzene			<0.10		mg/kg		0.1	10-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4969007								
WG3255736-1 MB								
Bromochloromethane			<0.10		mg/kg		0.1	10-JAN-20
Bromodichloromethane			<0.050		mg/kg		0.05	10-JAN-20
Bromoform			<0.050		mg/kg		0.05	10-JAN-20
Bromomethane			<0.050		mg/kg		0.05	10-JAN-20
n-Butylbenzene			<0.050		mg/kg		0.05	10-JAN-20
sec-Butylbenzene			<0.050		mg/kg		0.05	10-JAN-20
tert-Butylbenzene			<0.050		mg/kg		0.05	10-JAN-20
Carbon disulfide			<0.25		mg/kg		0.25	10-JAN-20
Carbon Tetrachloride			<0.050		mg/kg		0.05	10-JAN-20
Chlorobenzene			<0.050		mg/kg		0.05	10-JAN-20
Chloroethane			<0.050		mg/kg		0.05	10-JAN-20
Chloroform			<0.050		mg/kg		0.05	10-JAN-20
Chloromethane			<0.050		mg/kg		0.05	10-JAN-20
2-Chlorotoluene			<0.10		mg/kg		0.1	10-JAN-20
4-Chlorotoluene			<0.10		mg/kg		0.1	10-JAN-20
Dibromochloromethane			<0.050		mg/kg		0.05	10-JAN-20
1,2-Dibromo-3-chloropropane			<0.050		mg/kg		0.05	10-JAN-20
1,2-Dibromoethane			<0.050		mg/kg		0.05	10-JAN-20
Dibromomethane			<0.050		mg/kg		0.05	10-JAN-20
1,2-Dichlorobenzene			<0.050		mg/kg		0.05	10-JAN-20
1,3-Dichlorobenzene			<0.050		mg/kg		0.05	10-JAN-20
1,4-Dichlorobenzene			<0.050		mg/kg		0.05	10-JAN-20
Dichlorodifluoromethane			<0.050		mg/kg		0.05	10-JAN-20
1,1-dichloroethane			<0.050		mg/kg		0.05	10-JAN-20
1,2-Dichloroethane			<0.050		mg/kg		0.05	10-JAN-20
1,1-dichloroethene			<0.050		mg/kg		0.05	10-JAN-20
cis-1,2-Dichloroethene			<0.050		mg/kg		0.05	10-JAN-20
trans-1,2-Dichloroethene			<0.050		mg/kg		0.05	10-JAN-20
Dichloromethane			<0.10		mg/kg		0.1	10-JAN-20
1,2-Dichloropropane			<0.050		mg/kg		0.05	10-JAN-20
1,3-Dichloropropane			<0.050		mg/kg		0.05	10-JAN-20
2,2-Dichloropropane			<0.10		mg/kg		0.1	10-JAN-20
1,1-Dichloropropene			<0.050		mg/kg		0.05	10-JAN-20
cis-1,3-Dichloropropene			<0.050		mg/kg		0.05	10-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4969007								
WG3255736-1 MB								
trans-1,3-Dichloropropene			<0.050		mg/kg		0.05	10-JAN-20
Ethylbenzene			<0.015		mg/kg		0.015	10-JAN-20
F1			<10		mg/kg		10	10-JAN-20
Hexachlorobutadiene			<0.050		mg/kg		0.05	10-JAN-20
Hexane			<0.050		mg/kg		0.05	10-JAN-20
2-Hexanone (Methyl butyl ketone)			<0.50		mg/kg		0.5	10-JAN-20
Isopropylbenzene			<0.10		mg/kg		0.1	10-JAN-20
4-Isopropyltoluene			<0.10		mg/kg		0.1	10-JAN-20
MEK			<0.50		mg/kg		0.5	10-JAN-20
MIBK			<0.50		mg/kg		0.5	10-JAN-20
MTBE			<0.20		mg/kg		0.2	10-JAN-20
Styrene			<0.050		mg/kg		0.05	10-JAN-20
1,1,1,2-Tetrachloroethane			<0.050		mg/kg		0.05	10-JAN-20
1,1,2,2-Tetrachloroethane			<0.050		mg/kg		0.05	10-JAN-20
Tetrachloroethene			<0.050		mg/kg		0.05	10-JAN-20
Toluene			<0.050		mg/kg		0.05	10-JAN-20
1,2,3-Trichlorobenzene			<0.050		mg/kg		0.05	10-JAN-20
1,2,4-Trichlorobenzene			<0.050		mg/kg		0.05	10-JAN-20
1,1,1-Trichloroethane			<0.050		mg/kg		0.05	10-JAN-20
1,1,2-Trichloroethane			<0.050		mg/kg		0.05	10-JAN-20
Trichloroethene			<0.050		mg/kg		0.05	10-JAN-20
Trichlorofluoromethane			<0.050		mg/kg		0.05	10-JAN-20
1,2,3-Trichloropropane			<0.050		mg/kg		0.05	10-JAN-20
1,2,4-Trimethylbenzene			<0.050		mg/kg		0.05	10-JAN-20
1,3,5-Trimethylbenzene			<0.050		mg/kg		0.05	10-JAN-20
Vinyl Chloride			<0.050		mg/kg		0.05	10-JAN-20
M+P-Xylenes			<0.050		mg/kg		0.05	10-JAN-20
o-Xylene			<0.050		mg/kg		0.05	10-JAN-20
Surrogate: 1,4-Difluorobenzene (SS)			96.4		%		70-130	10-JAN-20
Surrogate: 3,4-Dichlorotoluene (SS)			111.7		%		70-130	10-JAN-20
Surrogate: 4-Bromofluorobenzene (SS)			90.2		%		70-130	10-JAN-20

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
RRQC	Refer to report remarks for information regarding this QC result.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
% Moisture							
	1	16-DEC-19	09-JAN-20 12:00	14	24	days	EHTR
	2	16-DEC-19	09-JAN-20 12:00	14	24	days	EHTR
	3	16-DEC-19	09-JAN-20 12:00	14	24	days	EHTR
	4	16-DEC-19	09-JAN-20 12:00	14	24	days	EHTR
	5	16-DEC-19	09-JAN-20 12:00	14	24	days	EHTR
	6	20-DEC-19	09-JAN-20 12:00	14	20	days	EHTR
Aggregate Organics							
Extractable Organic Halides (EOX)							
	1	16-DEC-19	14-JAN-20 00:00	28	29	days	EHT
	2	16-DEC-19	14-JAN-20 00:00	28	29	days	EHT
	4	16-DEC-19	14-JAN-20 00:00	28	29	days	EHT
	5	16-DEC-19	14-JAN-20 00:00	28	29	days	EHT
Hydrocarbons							
CCME Total Extractable Hydrocarbons							
	1	16-DEC-19	10-JAN-20 14:00	14	25	days	EHTR
	2	16-DEC-19	10-JAN-20 14:00	14	25	days	EHTR
	3	16-DEC-19	10-JAN-20 14:00	14	25	days	EHTR
	4	16-DEC-19	10-JAN-20 14:00	14	25	days	EHTR
	5	16-DEC-19	10-JAN-20 14:00	14	25	days	EHTR
	6	20-DEC-19	10-JAN-20 14:00	14	21	days	EHTR
Polycyclic Aromatic Hydrocarbons							
Polyaromatic Hydrocarbons (PAHs)							
	1	16-DEC-19	09-JAN-20 00:00	14	24	days	EHTR
	2	16-DEC-19	09-JAN-20 00:00	14	24	days	EHTR
	4	16-DEC-19	09-JAN-20 00:00	14	24	days	EHTR
	5	16-DEC-19	09-JAN-20 00:00	14	24	days	EHTR
	6	20-DEC-19	09-JAN-20 00:00	14	20	days	EHTR

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2403425 were received on 08-JAN-20 12:45.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

January 14, 2020

Ms. Judy Dalmaijer
ALS Environmental-Winnipeg MB
Unit 12–1329 Niakwa Road East
Winnipeg, MB, R2J 3T4

Certificate of Analysis

Project Name:	**TOX**	Workorder:	**3079655**
Purchase Order:		Workorder ID:	**L2403425**

Dear Ms. Dalmaijer:

Enclosed are the analytical results for samples received by the laboratory on Thursday, January 9, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Sarah S Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Bea Ryback , Mr. Craig Riddell

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3079655 L2403425

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3079655001	L240345-1	Solid	12/16/2019 00:00	1/9/2020 10:27	Collected by Client
3079655002	L240345-2	Solid	12/16/2019 00:00	1/9/2020 10:27	Collected by Client
3079655003	L240345-4	Solid	12/16/2019 00:00	1/9/2020 10:27	Collected by Client
3079655004	L240345-5	Solid	12/16/2019 00:00	1/9/2020 10:27	Collected by Client

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3079655 L2403425

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3079655 L2403425

Lab ID: **3079655001** Date Collected: 12/16/2019 00:00 Matrix: Solid

Sample ID: **L240345-1** Date Received: 1/9/2020 10:27

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	6.6	SW846 9023			1/14/20 12:06	PAG	A
Moisture	27.6		%	0.1	S2540G-11			1/10/20 09:47	AXD	
Total Solids	72.4	1	%	0.1	S2540G-11			1/10/20 09:47	AXD	

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3079655 L2403425

Lab ID: **3079655002** Date Collected: 12/16/2019 00:00 Matrix: Solid

Sample ID: **L240345-2** Date Received: 1/9/2020 10:27

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	7.1	SW846 9023			1/14/20 12:16	PAG	A
Moisture	31.8		%	0.1	S2540G-11			1/10/20 09:47	AXD	
Total Solids	68.2	1	%	0.1	S2540G-11			1/10/20 09:47	AXD	

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3079655 L2403425

Lab ID: **3079655003** Date Collected: 12/16/2019 00:00 Matrix: Solid

Sample ID: **L240345-4** Date Received: 1/9/2020 10:27

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	7.1		mg/kg	6.4	SW846 9023			1/14/20 12:35	PAG	A
Moisture	28.8		%	0.1	S2540G-11			1/10/20 09:47	AXD	
Total Solids	71.2	1	%	0.1	S2540G-11			1/10/20 09:47	AXD	

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3079655 L2403425

Lab ID: **3079655004** Date Collected: 12/16/2019 00:00 Matrix: Solid

Sample ID: **L240345-5** Date Received: 1/9/2020 10:27

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	6.5	SW846 9023			1/14/20 12:48	PAG	A
Moisture	25.7		%	0.1	S2540G-11			1/10/20 09:47	AXD	
Total Solids	74.3	1	%	0.1	S2540G-11			1/10/20 09:47	AXD	

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3079655 L2403425

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3079655001	1	L240345-1	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				
3079655002	1	L240345-2	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				
3079655003	1	L240345-4	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				
3079655004	1	L240345-5	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3079655 L2403425

Lab ID	Sample ID	Analysis Method	Prep Method
3079655001	L240345-1	S2540G-11	
3079655001	L240345-1	SW846 9023	
3079655002	L240345-2	S2540G-11	
3079655002	L240345-2	SW846 9023	
3079655003	L240345-4	S2540G-11	
3079655003	L240345-4	SW846 9023	
3079655004	L240345-5	S2540G-11	
3079655004	L240345-5	SW846 9023	

QUALITY CONTROL DATA

Workorder: 3079655 L2403425

QC Batch: WETC/232971 **Analysis Method:** S2540G-11

QC Batch Method: S2540G-11

Associated Lab Samples: 3079655001, 3079655002, 3079655003, 3079655004

SAMPLE DUPLICATE: 3071456 ORIGINAL: 3079494001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	78.5185	%	78.6246	.14	10
Total Solids	21.4814	%	21.3753	.5	5

SAMPLE DUPLICATE: 3071457 ORIGINAL: 3079460003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	8.4651	%	7.7261	9.13	10
Total Solids	91.5348	%	92.2738	.8	5

SAMPLE DUPLICATE: 3071458 ORIGINAL: 3079655001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	27.647	%	27.4878	.58	10
Total Solids	72.3529	%	72.5121	.22	5

SAMPLE DUPLICATE: 3071459 ORIGINAL: 3079734005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	99.7414	%	99.732	.009	10
Total Solids	.2585	%	.2679	3.57	5

SAMPLE DUPLICATE: 3071460 ORIGINAL: 3079766007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	2.0018	%	2.1259	6.01	10
Total Solids	97.9981	%	97.874	.13	5

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3079655 L2403425

SAMPLE DUPLICATE: 3071461 ORIGINAL: 3078769026

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	22.4344	%	22.3398	.42	10
Total Solids	77.5655	%	77.6601	.12	5

QUALITY CONTROL DATA

Workorder: 3079655 L2403425

QC Batch: WETC/233109 **Analysis Method:** SW846 9023

QC Batch Method: SW846 9023

Associated Lab Samples: 3079655001, 3079655002, 3079655003, 3079655004

METHOD BLANK: 3072995

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	mg/kg	5.0

LABORATORY CONTROL SAMPLE: 3072996

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	104	mg/kg	500	521	90 - 110

LABORATORY CONTROL SAMPLE: 3072997

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	104	mg/kg	500	521	90 - 110

MATRIX SPIKE: 3073268 DUPLICATE: 3073269 ORIGINAL: 3079655002

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Halogen, Total Organic (TOX)	2.895	mg/kg	483	493.77	506.96	102	104	80 - 120	2.64	20

METHOD BLANK: 3072999

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	mg/kg	5.0

QUALITY CONTROL DATA

Workorder: 3079655 L2403425

METHOD BLANK: 3073001

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	mg/kg	5.0

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3079655 L2403425

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3079655001	L240345-1			S2540G-11	WETC/232971
3079655002	L240345-2			S2540G-11	WETC/232971
3079655003	L240345-4			S2540G-11	WETC/232971
3079655004	L240345-5			S2540G-11	WETC/232971
3079655001	L240345-1			SW846 9023	WETC/233109
3079655002	L240345-2			SW846 9023	WETC/233109
3079655003	L240345-4			SW846 9023	WETC/233109
3079655004	L240345-5			SW846 9023	WETC/233109

ALS Environmental

L2403425

WINNIPEG

30796555

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
34 DOGWOOD LANE
MIDDLETOWN,PENNSYLVANIA 17057

NOTES: Please reference on final report and invoice: PO# *L2403425*
ALS requires QC data to be provided with your final results.

Please see enclosed 4 sample(s) in 4 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L2403425-1 TH19-01 @ 0.8M	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 16/ 2019 / 1/24/2020	
L2403425-2 TH19-05 @ 0.8M	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 16/ 2019 / 1/24/2020	
L2403425-4 TH19-09 @ 0.8M	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 16/ 2019 / 1/24/2020	
L2403425-5 TH19-06 @ 0.8M	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 16/ 2019 / 1/24/2020	

Subcontract Info Contact: Judy Dalmaijer (204) 255-9749
Analysis and reporting info contact: Judy Dalmaijer
12-1329 NIAKWA ROAD E
WINNIPEG,MB R2J3T4
Phone: (204) 255-9749 Email: Judy.Dalmaijer@alsglobal.com

Please email confirmation of receipt to: Judy.Dalmaijer@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: 11/9/2020

Verified By: _____ Date Verified: 1027

Temperature: 9°

Sample Integrity Issues: _____

Vednesday, January 08, 2020 12:51 PM

USDA United States Department of Agriculture

United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection & Quarantine
4700 River Road
Riverdale, MD 20737

Permit to Receive Soil
Regulated by 7 CFR 330

This permit was generated electronically via the ePermits system.

PERMITTEE NAME:	Susan Magness	**PERMIT NUMBER:**	P330-18-00175
COMPANY:	ALS Environmental-Middletown	**APPLICATION NUMBER:**	P525-181207-001
RECEIVING ADDRESS:	301 Fulling Mill Road Middletown, PA 17057	**DATE ISSUED:**	06/15/2018
MAILING ADDRESS:	301 Fulling Mill Road Middletown, PA 17057		
PHONE:	(717) 944-5541	**DATE AMENDED:**	**12/11/2018**
FAX:		**EXPIRES:**	**06/15/2021**

PORTS OF ARRIVAL/PLANT INSPECTION STATIONS: AK, Anchorage; AL, Huntsville; AL, Mobile; AZ, Douglas; AZ, Lukeville; AZ, Naco; AZ, Nogales; AZ, Phoenix; AZ, San Luis; AZ, Tucson; CA, Calexico; CA, El Segundo; CA, Fresno; CA, Long Beach; CA, Oakland; CA, Ontario; CA, Otay Mesa; CA, Port Hueneme; CA, Sacramento; CA, San Diego; CA, San Francisco; CA, San Jose; CA, San Ysidro; CA, Tecate; CO, Denver; CT, Hartford; CT, New Haven; DE, Dover; DE, Wilmington; FL, Ft. Lauderdale; FL, Ft. Myers; FL, Ft. Pierce; FL, Jacksonville; FL, Key West; FL, Miami; FL, Miami (Cargo, DHL, Fed Ex, UPS, etc); FL, Orlando; FL, Pensacola; FL, Port Canaveral; FL, Port Everglades; FL, Sanford; FL, Tampa; FL, West Palm Beach; GA, Atlanta; GA, Savannah; GU, Agana; HI, Hilo; HI, Honolulu; HI, Kahului; HI, Kailua-Kona; HI, Lihue; ID, Eastport; IL, Chicago; IN, Indianapolis; KY, Louisville; MA, South Boston; MD, Baltimore; MD, Beltsville; ME, Bangor; ME, Calais; ME, Houlton; ME, Portland; MI, Detroit; MI, Port Huron; MI, Romulus; MI, Sault Saint Marie; MN, Duluth; MN, Grand Portage; MN, International Falls; MN, Minneapolis; MO, Kansas City; MO, St. Louis; MP, Commonwealth of the Northern Mariana Islands; MS, Gulfport; MS, Port Bienville; MT, Raymond; MT, Roosville; MT, Sweetgrass; NC, Raleigh; NC, Wilmington; ND, Dunseith; ND, Pembina; ND, Portal; NJ, Linden; NM, Albuquerque; NM, Columbus; NM, SantaTeresa; NV, Las Vegas; NY, Albany; NY, Alexandria Bay; NY, Brooklyn; NY, Buffalo; NY, Champlain, Rouses Point; NY, Jamaica; NY, Newburgh; OH, Ashtabula; OH, Cincinnati; OH, Cleveland; OH, Columbus; OH, Toledo; OH, Wilmington; OK, Oklahoma City; OR, Portland; PA, Allentown; PA, Harrisburg; PA, Philadelphia; PA, Pittsburgh; PA, Scranton; PR, Aguadilla; PR, Carolina; PR, Fajardo; PR, Mayaguez; PR, Ponce; RI, Warwick/Providence; SC, Charleston; TN, Memphis; TN, Nashville; TX, Austin; TX, Brownsville; TX, Corpus Christi; TX, Dallas; TX, Del Rio; TX, Eagle Pass; TX, El Paso; TX, Fabens; TX, Falcon; TX, Fort Hancock; TX, Freeport; TX, Galveston; TX, Hidalgo; TX, Humble; TX, Laredo; TX, Los Indios; TX, Pharr; TX, Port Arthur; TX, Presidio; TX, Progresso; TX, Rio Grande City; TX, Roma; TX, San Antonio; TX, Victoria; UT, Salt Lake City; VA, Dulles; VA, Norfolk; VI, St. Croix; VI, St. Thomas; VT, Berlin; WA, Blaine; WA, Oroville; WA, Port Angeles; WA, SeaTac; WA, Sumas; WI, Green Bay; WI, Milwaukee

HAND CARRY: Yes

Under the conditions specified, this permit authorizes the following:

Quantity of Soil per Shipment and Treatment

3 lbs or less: Sterilization will interfere with intended use - Your facility MUST be inspected and approved to receive this soil

SPECIAL INSTRUCTIONS TO INSPECTORS

Permit Number P330-18-00175

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.  Gibbs Smith	DATE 12/11/2018

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

PERMIT CONDITIONS

CHEMICAL/PHYSICAL ANALYSIS IMPORTATION

USDA-APHIS issues this permit to Susan Magness with ALS Environmental-Middletown in Middletown, PA. The permit authorizes the importation of soil from all foreign sources (except countries with sanctions or embargoes by U.S. State Department) only for chemical/physical analysis in a controlled laboratory environment at the named facility on the permit.

HAND-CARRY

This permit also authorizes Susan Magness to hand carry the regulated soil per hand carry conditions stipulated below.

1. If an accidental release into the environment occurs, notification must be made within one business day to APHIS, PPQ, 4700 River Rd., unit 133; Riverdale, MD 20737; 866-524-5421. A written report of the incident must be submitted identifying: (a) the name of the permit holder (responsible person), (b) the permit number, (c) the country or State of origin of the soil, (d) the nature of the release, and (e) measures already taken to contain, reduce or limit the effects of the accidentally released soil. Any plans prepared to contain, reduce or limit the effects of the accidentally released soil may be submitted as developed.

2.

- This permit is issued by the United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). It conveys APHIS regulations and requirements for the material(s) listed on this permit. It does not reduce or eliminate your legal duty and responsibility to comply with all other applicable Federal and State regulatory requirements.
- The permit number or a copy of the permit must accompany the shipment.
- You must be an individual at least 18 years old, or legal entity such as partnership, corporation, association, or joint venture.
- You are legally responsible for complying with all permit requirements and permit conditions.
- The regulated material and shipping container(s) are subject to inspection by officials of Custom and Border Protection (CBP) and APHIS. CBP or APHIS officials may require the shipment to be treated, seized, re-exported, or destroyed (in part or whole). You will be responsible for expenses.
- If you violate any applicable laws associated with this permit, you may face substantial

Permit Number P330-18-00175

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 Gibbs Smith	12/11/2018

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10. Further distribution of soil is not allowed without a permit from the receiving lab. While in storage, all soil must be kept locked (e.g. in freezer, cabinet) in the approved lab with access limited to authorized personnel or they will be in a restricted access building that requires a key card entry and access is restricted to authorized personnel only; or it must be in locked room restricted to authorized personnel only.

11. The soil must be handled as quarantined material until sterilized. This will include keeping the soil enclosed in containers when not in use and labeling all containers and/or storage areas:

12. All packing material, media, substrate, and shipping containers must be sterilized or destroyed as approved and prescribed by the permit conditions after removing the soil.

13. All unconsumed soil, containers and effluent must be autoclaved, incinerated or properly sterilized by the permittee at the conclusion of the project as approved and prescribed by the permit conditions.

14. Any water residues (effluent) from the processing of soil samples must be treated by an approved sterilization procedure such as hydroclave or autoclave.

15. All soil residues must be dry-heat treated, incinerated, hydroclaved or autoclaved or any other procedure approved by the Deputy Administrator.

Dry Heat Treatment: use one of the following schedules:

110- 120.5 degrees C (230-249 F) for 16 hours
121-154 degrees C (250-309 F) for 2 hours
154.4 - 192.5 degrees C (310-379 F) for 30 minutes
193-220 degrees C (380-429 F) for 4 minutes
221-232 degrees C (430-450) for 2 minutes

Time starts when the entire sample reaches the required temperature, and a suitable temperature probe or currently calibrated thermometer must be used for verification.

Autoclaving Waste

a. Waste must be autoclaved at 121 degrees Centigrade (250 degrees Fahrenheit) for a minimum of 30 minutes.

b. Autoclave tape or other indicators must be placed on each load prior to treatment. The autoclave tape or other indicator on each container must be checked to verify color change before disposal.

c. The autoclave must be professionally calibrated annually and a written record must be maintained.

Permit Number P330-18-00175

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Gibbs Smith	12/11/2018

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17. The permit holder must:

- maintain a valid PPQ 330 permit so long as any portion of the regulated soil remains untreated,
- not assign or transfer this permit to other persons without prior APHIS PPQ authorization,
- maintain an official permanent work assignment, residence, or affiliation at the address on this permit,
- notify the Pest Permit Staff as soon as possible of any change in the permit holder's work assignment, residence, or affiliation,
- notify the Pest Permit Staff of the receipt of unauthorized and/or misdirected shipments of regulated soil,
- adequately mitigate environmental impacts resulting from unauthorized release of the regulated soil,
- notify the Pest Permit Staff if the facility is damaged/destroyed or if you wish to decommission the facility,
- devitalize/sterilize all regulated soil prior to departure from the organization unless other arrangements are confirmed by the Pest Permit Staff.

Notifications to the Pest Permit Staff must be made via 866-524-5421 or pest.permits@aphis.usda.gov within one business day of the event triggering a notification.

18. Upon issuance of this permit (i.e., a signed PPQ 330), you will need to request the PPQ Form 550 Black/White labels at least 5 days in advance of shipping date. If you applied online using ePermits, you may request the labels using the My Shipments/Labels feature. Otherwise, send your request to BlackWhiteGreenYellowlabelrequest@aphis.usda.gov. All email requests must come from the permit holder or appointee, if requested by the appointee the permit holder must be Ccýd on all requests. Specify the approved port as listed on the permit and the total number of labels needed in multiples of four. You may request additional labels the same way. We will send you the labels by email as a pdf.

Permit Number P330-18-00175

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Gibbs Smith	12/11/2018

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23.

- This permit is issued by the United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). It conveys APHIS regulations and requirements for the material(s) listed on this permit. It does not reduce or eliminate your legal duty and responsibility to comply with all other applicable Federal and State regulatory requirements.
- The permit number or a copy of the permit must accompany the shipment.
- You must be an individual at least 18 years old, or legal entity such as partnership, corporation, association, or joint venture.
- You are legally responsible for complying with all permit requirements and permit conditions.
- The regulated material and shipping container(s) are subject to inspection by officials of Custom and Border Protection (CBP) and APHIS. CBP or APHIS officials may require the shipment to be treated, seized, re-exported, or destroyed (in part or whole). You will be responsible for expenses.
- If you violate any applicable laws associated with this permit, you may face substantial civil or criminal penalties. We may cancel all current permits and deny future permit applications.
- Without prior notice and during reasonable hours, authorized Federal and State Regulators must be allowed to inspect the conditions associated with the regulated materials/organisms authorized under this permit.

24. All solid wood packing material (SWPM) accompanying the shipment must be in compliance with ISPM 15 treatment regulations and IPPC stamp requirements and enforcement. Noncompliant shipments will be treated, re-exported or destroyed at the consignee's expense.

25. All operations must be consistent with information submitted in association with the above listed APHIS-PPQ inspected facility and subject to the conditions below.

26. Soil must be shipped in a securely closed, watertight container (primary container, test tube, vial, etc.) which must be enclosed in a second, durable watertight container (secondary container).

Permit Number P330-18-00175

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Gibbs Smith	12/11/2018

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36. All soil residues must be dry-heat treated, incinerated, hydroclaved or autoclaved or any other procedure approved by the Deputy Administrator.

Dry Heat Treatment: use one of the following schedules:

110- 120.5 degrees C (230-249 F) for 16 hours
121-154 degrees C (250-309 F) for 2 hours
154.4 - 192.5 degrees C (310-379 F) for 30 minutes
193-220 degrees C (380-429 F) for 4 minutes
221-232 degrees C (430-450) for 2 minutes

Time starts when the entire sample reaches the required temperature, and a suitable temperature probe or currently calibrated thermometer must be used for verification.

Autoclaving Waste

a. Waste must be autoclaved at 121 degrees Centigrade (250 degrees Fahrenheit) for a minimum of 30 minutes.

b. Autoclave tape or other indicators must be placed on each load prior to treatment. The autoclave tape or other indicator on each container must be checked to verify color change before disposal.

c. The autoclave must be professionally calibrated annually and a written record must be maintained.

d. Every 3 months, you must use a commercially available biological indicator kit that uses bacterial spores (e.g. Geobacillus species) that are rendered unviable at 121 degrees C. You must follow the manufacturerýs instructions. If any growth is observed, you must have the autoclave serviced and retested.

Incineration:
With the exception of metal and glass containers, all regulated and associated material must be reduced completely to ash at the end of the incineration cycle.

Hydroclave soil and other material using the following conditions:

a. Soil must be hydroclaved at 121 degrees Centigrade (250 degrees Fahrenheit) for a minimum of 30 minutes, or at 132 degrees Centigrade (267 degrees Fahrenheit) for a minimum of 15 minutes.

Permit Number P330-18-00175

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.	DATE
Gibbs Smith	12/11/2018

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C s 1001)

Enclose the following supplemental information in each shipment:
- Permittee Name
- Permit number
- Label number

Underlying packaging/wrapping must carry the address, billing, and any other information required to direct the shipment to its final destination (i.e., the permit holder's address; N.B., USDA APHIS does not defray any additional shipping costs incurred for transiting the shipment through an inspection station as the initial US destination).

39. HAND CARRY PART 1 OF 2

The following conditions apply to all authorized hand carry events. Note that no PPQ-issued labels are required for hand carry events.

a) At least 20 days prior to each hand carry event, the permit holder or designee must notify the PPQ Permit Compliance Officer by email at PPQSoilHandCarryRequest@aphis.usda.gov. In the subject line of the email, write "Notification of Hand Carry - Permit # xxxx":

The email must contain the following information:

- hand carrier's name and permit number
- anticipated first port of entry into the United States
- date and time of arrival and method of transport (maritime, land border, air)
- description of the regulated material/organism and packaging used for transport
- travel plans from the first port of arrival to the final destination

The PPQ Permit Compliance Officer will notify the Customs and Border Protection (CBP) Agricultural Specialist at the port of entry to document and facilitate the entry of the regulated material/organism.

If you have domestic (connecting) air travel plans, please contact the Transportation Security Administration (TSA) prior to arrival into the U.S.: TSA Contact Center Telephone:

Permit Number P330-18-00175

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Gibbs Smith	12/11/2018

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

materials) or 877-770-5990 (for restricted or prohibited plant material).

g) Within 24 hours of the first business day of the regulated material/organisms' arrival at the facility, an independent third party (e.g. containment facility director, departmental chair, campus biosafety officer, etc.) must notify the PPQ Permit Compliance Officer via email at: BlackWhiteGreenYellow.labelrequest@aphis.usda.gov that the shipment remained sealed until arrival. The notification must include what regulated material/organism was imported, its origin, permit number, date of arrival, and quantity. In the subject line of the email, please write: "Notification of Hand Carry Arrival - Permit # xxxx". See 29(a) above for the list of e-mail addresses to use for the notification.

Failure to notify the PPQ Permit Compliance Officer may result in loss of hand carry privileges. A PPQ inspector may visit the facility to confirm the arrival of the package and its contents.

41. The Permit holder must comply with all the items listed below. In cases where notification is required, the notification must be made to the Pest Permit staff at 866-524-5421 or pest.permits@aphis.usda.gov within one business day of the event triggering a notification. You must also notify the PPQ State Plant Health Director in your State. Access the list of SPHDs at https://www.aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/ct_sphd.

- maintain a valid PPQ 330 permit so long as any portion of the regulated soil remains untreated,
- not assign or transfer this permit to other persons without prior APHIS PPQ authorization,
- maintain an official permanent work assignment or affiliation at the address on this permit,
- notify the Pest Permit Staff of any change in the permit holder's work assignment, residence, or affiliation,
- notify the Pest Permit Staff of the receipt of unauthorized and/or misdirected shipments of regulated soil,
- adequately mitigate environmental impacts resulting from unauthorized or accidental release of the regulated soil,
- notify the Pest Permit Staff if the facility or equipment is damaged/destroyed or if you wish to decommission the facility,
- devitalize/sterilize all regulated soil prior to departure from the organization unless other arrangements are confirmed by the Pest Permit Staff,
- notify the Pest Permit Staff if you intend to let your permit expire and you will no longer receive or work with the regulated soil.

Permit Number P330-18-00175

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Gibbs Smith	12/11/2018

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301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AJ Winnipeg. Work Order #: 30796055 Initials: CLS Date: 1/9

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 12 1002 F45 04 6727 1730			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name? Client unp.		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab? not noted		YES	NO
5g. Does the COC note the matrix of the sample(s)? Soil		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: _____

Temperature (°C): 5

Thermometer ID: 525

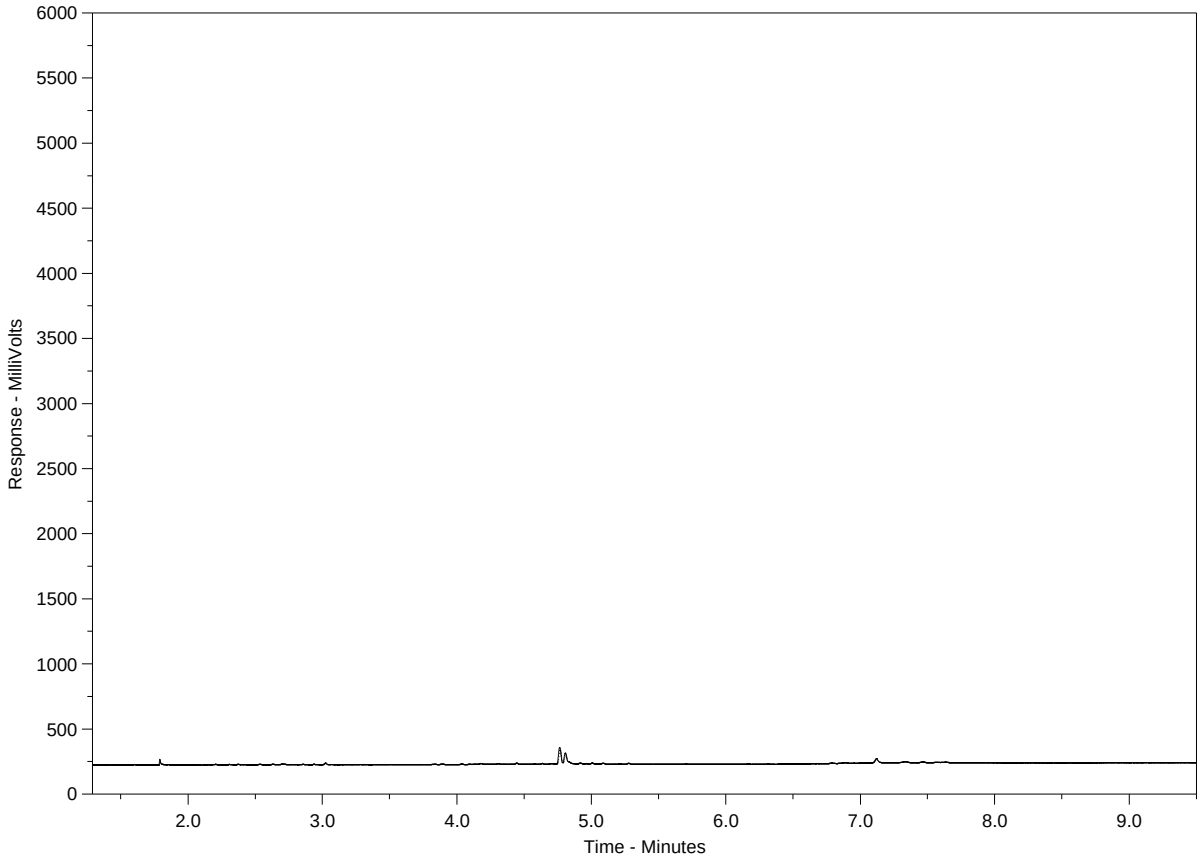
Radiological (µCi): _____

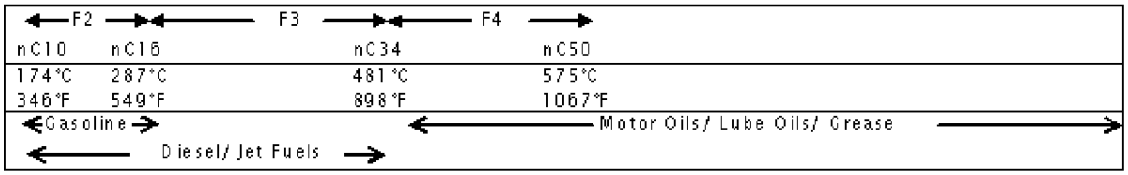
COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403425-1
Client Sample ID: TH19-01 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

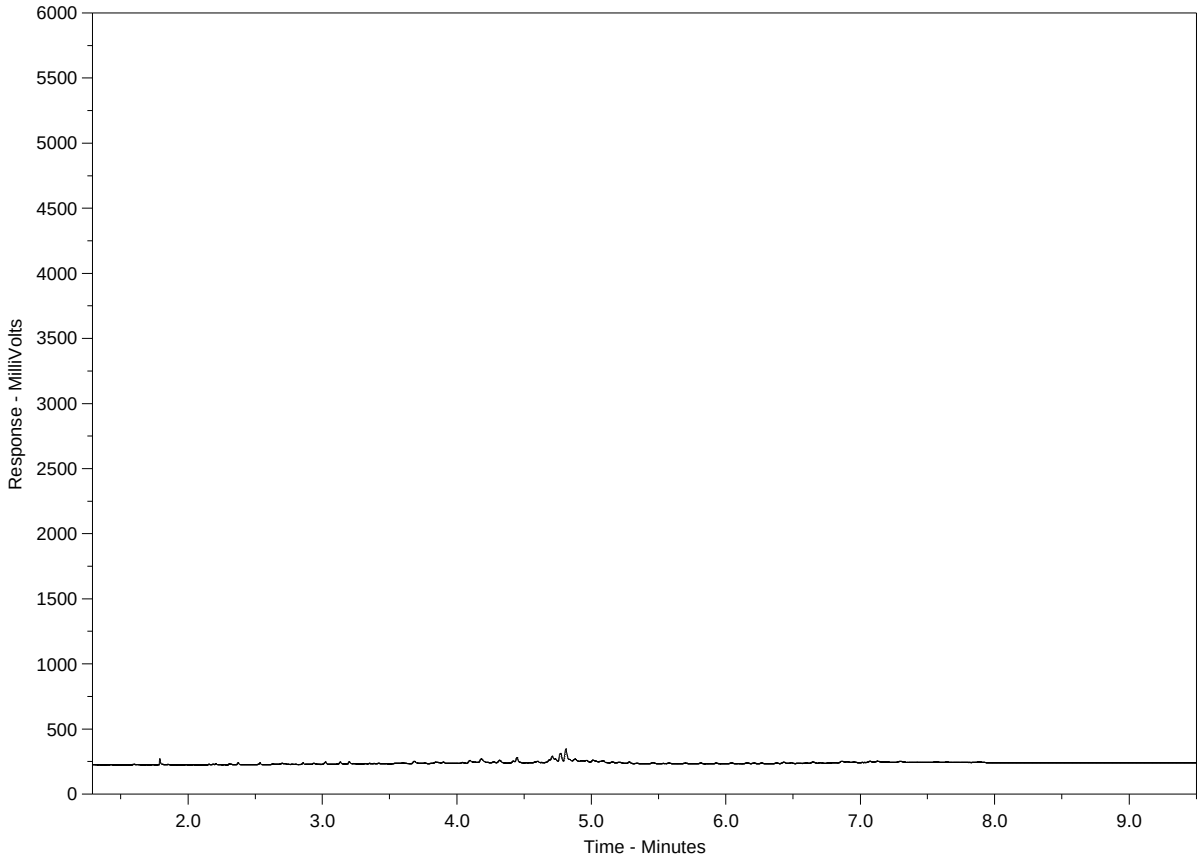
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

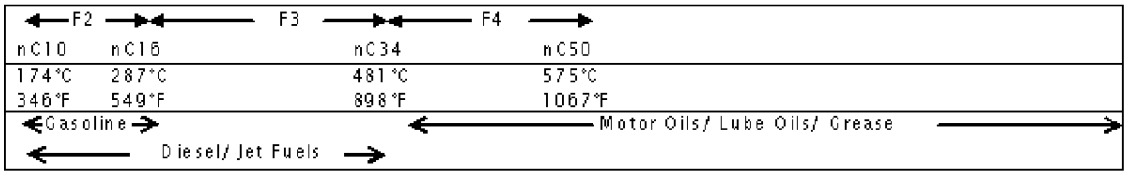
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403425-2
Client Sample ID: TH19-05 @ 0.8M





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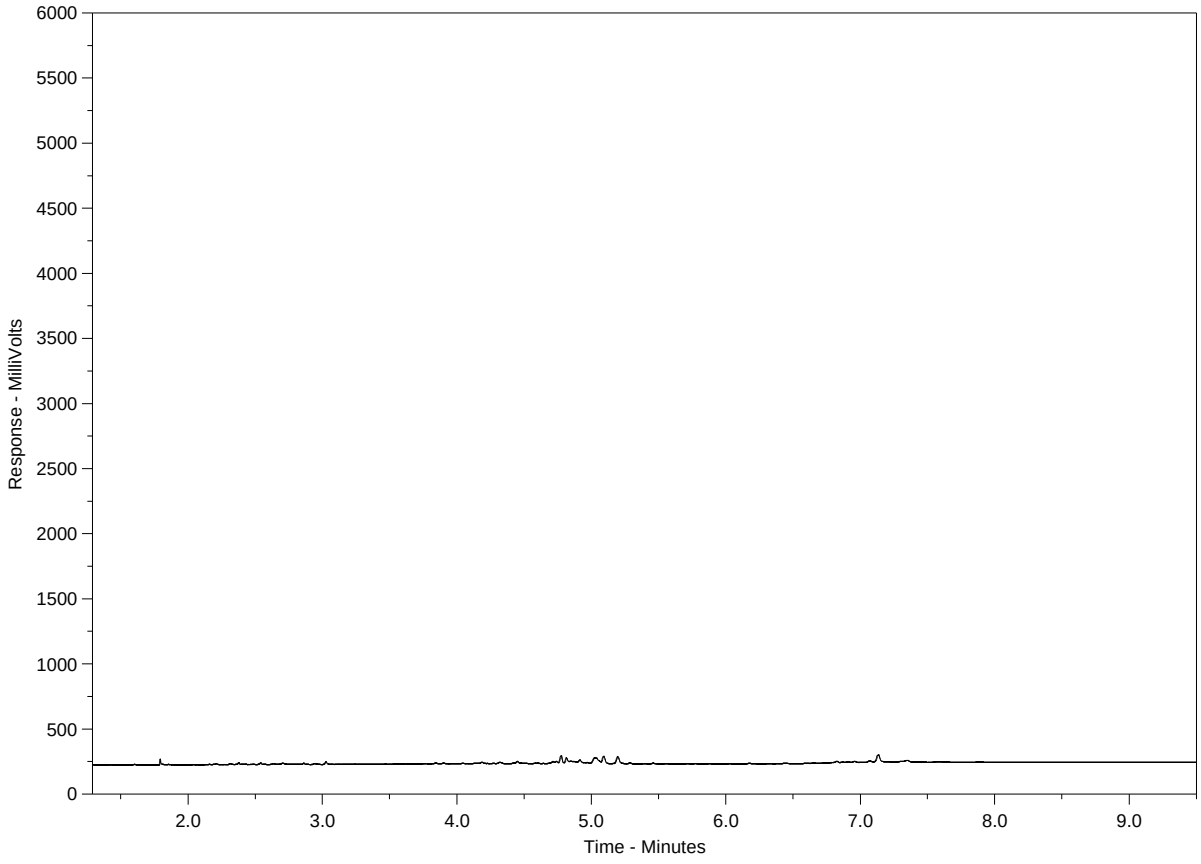
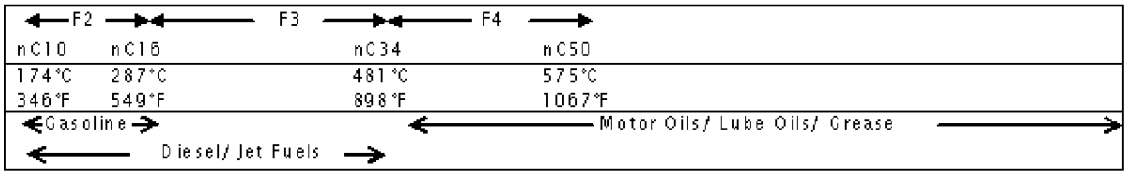
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403425-3
Client Sample ID: TH19-02 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

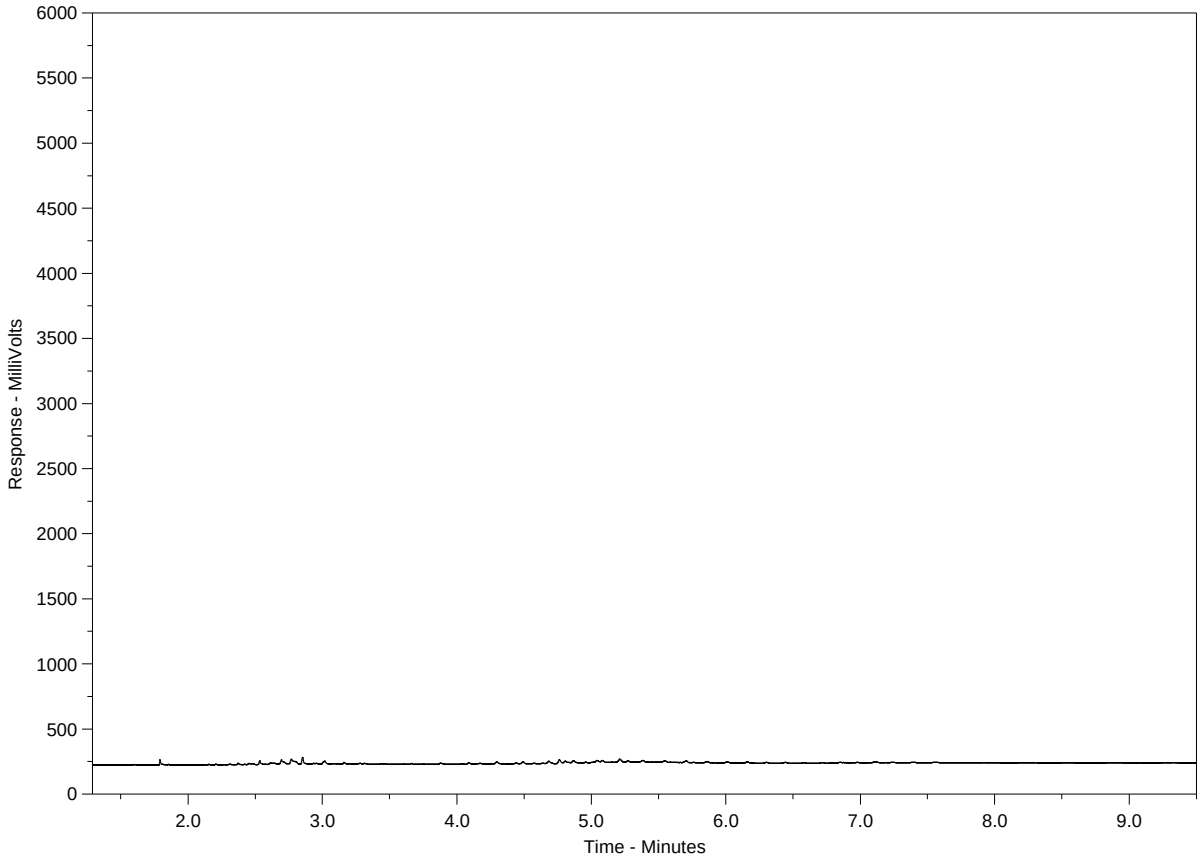
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

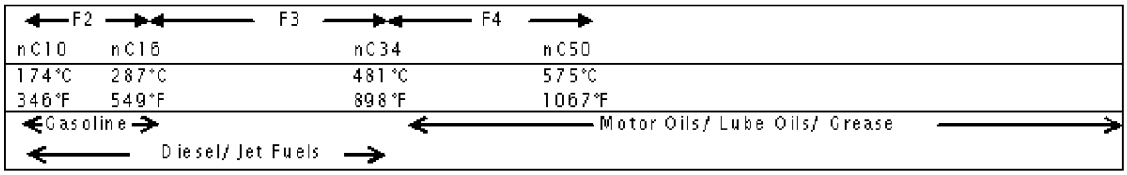
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403425-4
Client Sample ID: TH19-09 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

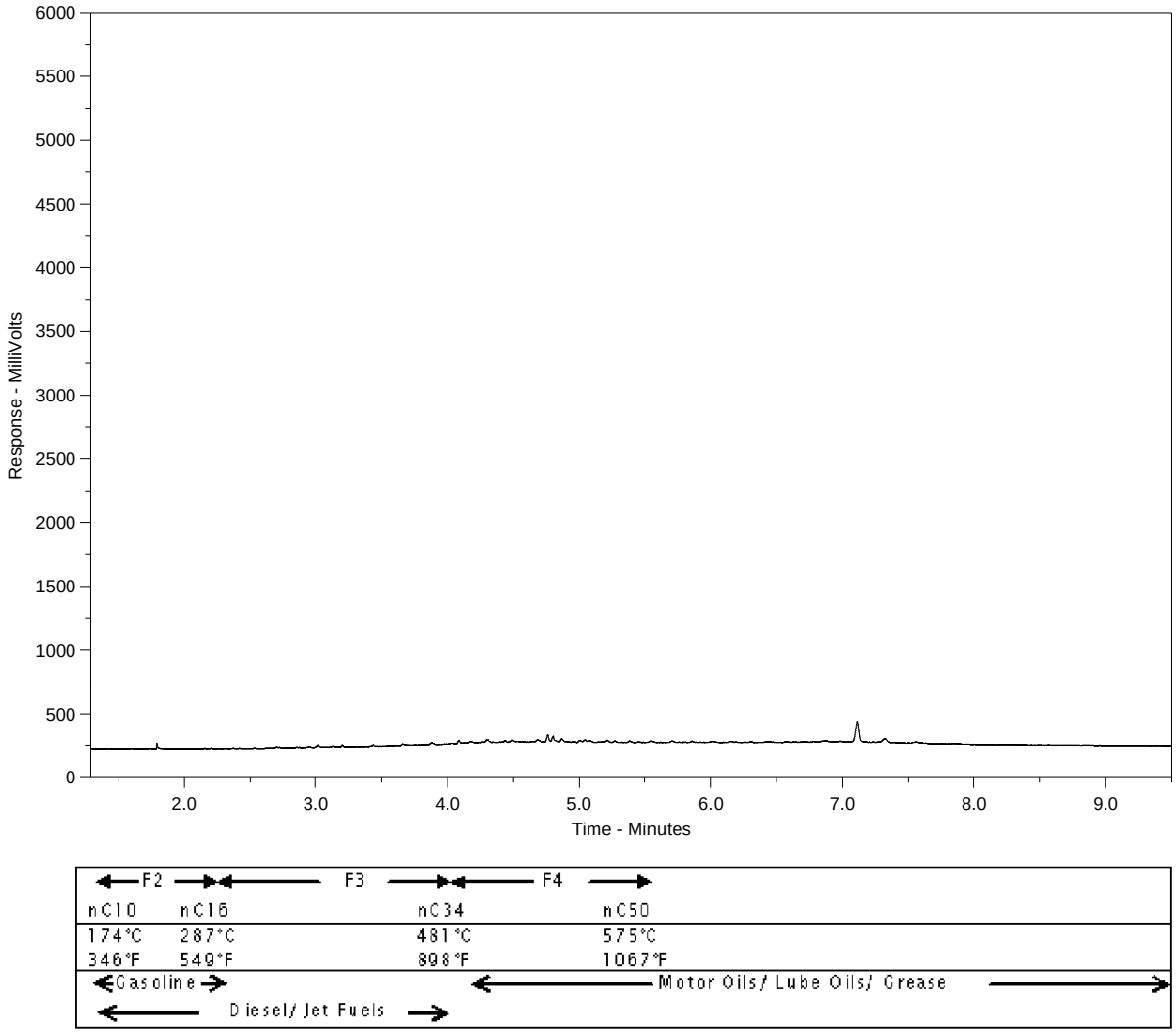
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403425-5
Client Sample ID: TH19-06 @ 0.8M



The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

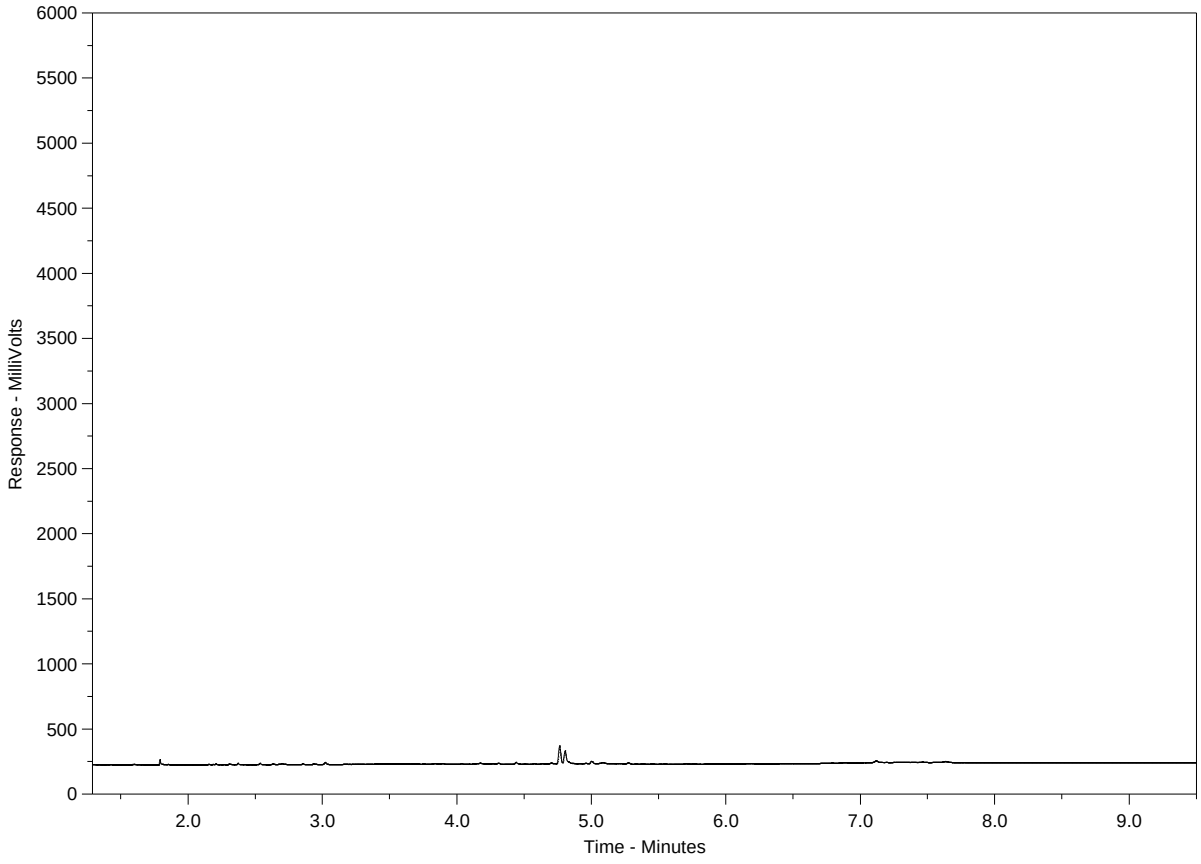
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

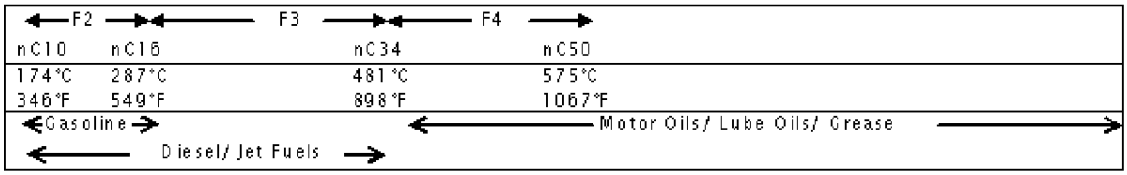
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403425-6
Client Sample ID: TH19-11 @ 1.5M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

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Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878
www.alsglobal.com

L2403425-COFC

Report to:	**Report Format / Distribution**	**Service Requested:**
Company: Wood	☑ Standard ☐ Other	☑ Regular Service (Default)
Contact:	☑ PDF ☑ Excel ☐ Fax	☐ Rush Service (2-3 Days)
Address: 440 Dovercourt Drive	Email 1: kevin.beechinor@woodplc.com	☐ Priority Service (1 Day or ASAP)
	Email 2: justin.huberdeau@woodplc.com	☐ Emergency Service (<1 Day / Wkend) - Contact ALS
Phone: (204)488-2997 Fax: (204)489-8261		**Analysis Request**
Invoice To: ☑ Same as Report	Indicate Bottles: Filtered / Preserved (F/P) →	
Company:	**Client / Project Information:**	
Contact:	Job #: WX18979 999 Redonda	
Address:	PO/AFE:	
Sample	Legal Site Description:	
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:** / **Sampler** (Initials):	

Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	BTEX F1 - F4	PAH	VOC	PCB	Metals	EOX	Grain Size (<75				Hazardous?	Highly Contaminated?	Number of Containers
	TH19-01 @ 0.8 m	16-Dec-19		Soil	X	X	X	X	X	X	X						
	TH19-05 @ 0.8 m	16-Dec-19		Soil	X	X	X	X	X	X							
	TH19-02 @ 0.8 m	16-Dec-19		Soil	X												
	TH19-09 @ 0.8 m	16-Dec-19		Soil	X	X	X	X	X	X							
	TH19-06 @ 0.8 m	16-Dec-19		Soil	X	X	X	X	X	X							
	TH19-11 @ 1.5 m	20-Dec-19		Soil	X	X	X	X	X								

Guidelines / Regulations	**Special Instructions / Hazardous Details**

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.

Relinquished By:	Angie Cerilli	Date & Time:	08-Jan-20	Received By:	CEL	Date & Time:	JAN 8	Sample Condition (lab use only)
Relinquished By:		Date & Time:		Received By:		Date & Time:	12:45	Temperature: 8.7 / Samples Received in Good Condition? Y / N (if no provided details)

Wood Environment & Infrastructure Solutions (Winnipeg)
ATTN: KEVIN BEECHINOR
440 Dovercourt Drive
Winnipeg MB R3Y 1G4

Date Received: 10-DEC-19
Report Date: 05-MAR-20 13:51 (MT)
Version: FINAL

Client Phone: 204-488-2997

Certificate of Analysis

Lab Work Order #: L2394273

Project P.O. #: NOT SUBMITTED
Job Reference: WX 18979 999 REDONDA
C of C Numbers:
Legal Site Desc:

Judy Dalmaijer
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-1 TH19-03 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	26.1		0.10	%		11-DEC-19	R4941938
Extractable Organic Halides (EOX)	See Attached					30-DEC-19	R5017777
Metals in Soil by CRC ICPMS							
Aluminum (Al)	27200		5000	mg/kg	20-DEC-19	27-DEC-19	R4957756
Antimony (Sb)	0.50		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Arsenic (As)	9.15		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Barium (Ba)	196		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Beryllium (Be)	1.03		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Boron (B)	14.4		5.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Bismuth (Bi)	0.26		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cadmium (Cd)	0.365		0.020	mg/kg	20-DEC-19	27-DEC-19	R4957756
Calcium (Ca)	63800		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Chromium (Cr)	43.3		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cobalt (Co)	12.3		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Copper (Cu)	29.9		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Iron (Fe)	28100		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lead (Pb)	13.2		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lithium (Li)	29.2		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Magnesium (Mg)	26900		20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Manganese (Mn)	630		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Molybdenum (Mo)	0.54		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Nickel (Ni)	35.4		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Phosphorus (P)	610		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Potassium (K)	4760		100	mg/kg	20-DEC-19	27-DEC-19	R4957756
Selenium (Se)	<0.20		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Silver (Ag)	0.12		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sodium (Na)	148		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Strontium (Sr)	91.4		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sulfur (S)	<1000		1000	mg/kg	20-DEC-19	27-DEC-19	R4957756
Thallium (Tl)	0.300		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tin (Sn)	<2.0		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Titanium (Ti)	214		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tungsten (W)	<0.50		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Uranium (U)	0.999		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Vanadium (V)	78.1		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zinc (Zn)	80.0		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zirconium (Zr)	7.2		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
2-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthylene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acridine	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Anthracene	<0.0040		0.0040	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)anthracene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Chrysene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-1 TH19-03 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluorene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Phenanthrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Quinoline	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	18-DEC-19	19-DEC-19	R4948769
IACR (CCME)	<0.15		0.15		18-DEC-19	19-DEC-19	R4948769
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	18-DEC-19	19-DEC-19	R4948769
Surrogate: Acenaphthene d10	104.8		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Chrysene d12	117.2		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Naphthalene d8	111.5		50-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Phenanthrene d10	109.1		60-130	%	18-DEC-19	19-DEC-19	R4948769
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1221	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1232	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1242	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1248	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1254	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1260	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1262	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1268	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Total PCBs	<0.050		0.050	mg/kg		17-DEC-19	R4944999
Surrogate: Decachlorobiphenyl	92.6		65-130	%		17-DEC-19	R4944999
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	13-DEC-19	14-DEC-19	R4943247
F3 (C16-C34)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
F4 (C34-C50)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
Surrogate: 2-Bromobenzotrifluoride	77.4		60-140	%	13-DEC-19	14-DEC-19	R4943247
Chrom. to baseline at nC50	YES				13-DEC-19	14-DEC-19	R4943247
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		23-DEC-19	
F2-Naphth	<25		25	mg/kg		23-DEC-19	
F3-PAH	<50		50	mg/kg		23-DEC-19	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		23-DEC-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		23-DEC-19	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	03-DEC-19	20-DEC-19	R4953041
Benzene	<0.0050		0.0050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Bromobenzene	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
Bromochloromethane	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
Bromodichloromethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Bromoform	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Bromomethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
n-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
sec-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
tert-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Carbon disulfide	<0.25		0.25	mg/kg	03-DEC-19	20-DEC-19	R4953041

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-1 TH19-03 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Carbon Tetrachloride	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Chlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Chloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Chloroform	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Chloromethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
2-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
4-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
Dibromochloromethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2-Dibromoethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Dibromomethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Dichlorodifluoromethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1-dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2-Dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1-dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Dichloromethane	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,3-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
2,2-Dichloropropane	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Ethylbenzene	<0.015		0.015	mg/kg	03-DEC-19	20-DEC-19	R4953041
F1	<10		10	mg/kg	03-DEC-19	20-DEC-19	R4953041
Hexachlorobutadiene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Hexane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	03-DEC-19	20-DEC-19	R4953041
Isopropylbenzene	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
4-Isopropyltoluene	<0.10		0.10	mg/kg	03-DEC-19	20-DEC-19	R4953041
MEK	<0.50		0.50	mg/kg	03-DEC-19	20-DEC-19	R4953041
MIBK	<0.50		0.50	mg/kg	03-DEC-19	20-DEC-19	R4953041
MTBE	<0.20		0.20	mg/kg	03-DEC-19	20-DEC-19	R4953041
Styrene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Tetrachloroethene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Toluene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Trichloroethene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Trichlorofluoromethane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-1 TH19-03 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Vinyl Chloride	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
M+P-Xylenes	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
o-Xylene	<0.050		0.050	mg/kg	03-DEC-19	20-DEC-19	R4953041
Surrogate: 1,4-Difluorobenzene (SS)	109.8		70-130	%	03-DEC-19	20-DEC-19	R4953041
Surrogate: 3,4-Dichlorotoluene (SS)	170.8	SURR-ND	70-130	%	03-DEC-19	20-DEC-19	R4953041
Surrogate: 4-Bromofluorobenzene (SS)	101.5		70-130	%	03-DEC-19	20-DEC-19	R4953041
L2394273-2 TH19-04 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	11.7		0.10	%		11-DEC-19	R4941938
F4G-SG	10600		500	mg/kg		17-DEC-19	R4945332
Extractable Organic Halides (EOX)	See Attached					30-DEC-19	R5017777
Metals in Soil by CRC ICPMS							
Aluminum (Al)	1400		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Antimony (Sb)	1.98		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Arsenic (As)	1.24		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Barium (Ba)	69.8		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Beryllium (Be)	<0.10		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Boron (B)	13.4		5.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Bismuth (Bi)	0.26		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cadmium (Cd)	0.552		0.020	mg/kg	20-DEC-19	27-DEC-19	R4957756
Calcium (Ca)	147000		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Chromium (Cr)	7.64		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cobalt (Co)	1.72		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Copper (Cu)	28.9		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Iron (Fe)	5160		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lead (Pb)	40.3		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lithium (Li)	3.6		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Magnesium (Mg)	86100		20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Manganese (Mn)	155		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Molybdenum (Mo)	1.70		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Nickel (Ni)	19.1		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Phosphorus (P)	132		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Potassium (K)	370		100	mg/kg	20-DEC-19	27-DEC-19	R4957756
Selenium (Se)	<0.20		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Silver (Ag)	0.10		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sodium (Na)	59		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Strontium (Sr)	39.3		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sulfur (S)	<1000		1000	mg/kg	20-DEC-19	27-DEC-19	R4957756
Thallium (Tl)	<0.050		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tin (Sn)	2.7		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Titanium (Ti)	53.3		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tungsten (W)	<0.50		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Uranium (U)	0.263		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Vanadium (V)	9.55		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zinc (Zn)	335		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zirconium (Zr)	<1.0		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.013		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
2-Methyl Naphthalene	0.021		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-2 TH19-04 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.0050		0.0050	mg/kg	18-DEC-19	20-DEC-19	R4948769
Acenaphthylene	<0.0050		0.0050	mg/kg	18-DEC-19	20-DEC-19	R4948769
Acridine	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Anthracene	0.0041	EMPC	0.0040	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(a)anthracene	<0.10	DLM	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(a)pyrene	<0.10	DLM	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(b&j)fluoranthene	0.12	EMPC	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(g,h,i)perylene	0.13	DLM	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(k)fluoranthene	<0.10	DLM	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Chrysene	0.30	EMPC	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Dibenzo(a,h)anthracene	<0.050	DLM	0.050	mg/kg	18-DEC-19	20-DEC-19	R4948769
Fluoranthene	0.032		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Fluorene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Indeno(1,2,3-cd)pyrene	<0.10	DLM	0.10	mg/kg	18-DEC-19	20-DEC-19	R4948769
Naphthalene	0.014		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Phenanthrene	0.020		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Pyrene	0.091		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Quinoline	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
B(a)P Total Potency Equivalent	0.106		0.096	mg/kg	18-DEC-19	20-DEC-19	R4948769
IACR (CCME)	1.6		1.1		18-DEC-19	20-DEC-19	R4948769
Benzo(b+j+k)fluoranthene	<0.14		0.14	mg/kg	18-DEC-19	20-DEC-19	R4948769
Surrogate: Acenaphthene d10	100.9		60-130	%	18-DEC-19	20-DEC-19	R4948769
Surrogate: Chrysene d12	100.9		60-130	%	18-DEC-19	20-DEC-19	R4948769
Surrogate: Naphthalene d8	97.1		50-130	%	18-DEC-19	20-DEC-19	R4948769
Surrogate: Phenanthrene d10	94.5		60-130	%	18-DEC-19	20-DEC-19	R4948769
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1221	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1232	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1242	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1248	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1254	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1260	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1262	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1268	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Total PCBs	<0.050		0.050	mg/kg		17-DEC-19	R4944999
Surrogate: Decachlorobiphenyl	71.7		65-130	%		17-DEC-19	R4944999
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<250	DLM	250	mg/kg	13-DEC-19	17-DEC-19	R4945202
F3 (C16-C34)	2260	DLM	500	mg/kg	13-DEC-19	17-DEC-19	R4945202
F4 (C34-C50)	2500	DLM	500	mg/kg	13-DEC-19	17-DEC-19	R4945202
Surrogate: 2-Bromobenzotrifluoride	79.6		60-140	%	13-DEC-19	17-DEC-19	R4945202
Chrom. to baseline at nC50	NO				13-DEC-19	17-DEC-19	R4945202
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		23-DEC-19	
F2-Naphth	<250		250	mg/kg		23-DEC-19	
F3-PAH	2260		500	mg/kg		23-DEC-19	
Total Hydrocarbons (C6-C50)	4750		750	mg/kg		23-DEC-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		23-DEC-19	
VOC plus F1 by GCMS							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-2 TH19-04 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
Benzene	<0.0050		0.0050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromobenzene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromochloromethane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromodichloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromoform	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromomethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
n-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
sec-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
tert-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Carbon disulfide	<0.25		0.25	mg/kg	03-DEC-19	21-DEC-19	R4953041
Carbon Tetrachloride	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloroform	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
4-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dibromochloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dibromoethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dibromomethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dichlorodifluoromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dichloromethane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2,2-Dichloropropane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Ethylbenzene	<0.015		0.015	mg/kg	03-DEC-19	21-DEC-19	R4953041
F1	<10		10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Hexachlorobutadiene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Hexane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
Isopropylbenzene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
4-Isopropyltoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
MEK	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
MIBK	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
MTBE	<0.20		0.20	mg/kg	03-DEC-19	21-DEC-19	R4953041
Styrene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-2 TH19-04 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Tetrachloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Toluene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Trichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Trichlorofluoromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Vinyl Chloride	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
M+P-Xylenes	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
o-Xylene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Surrogate: 1,4-Difluorobenzene (SS)	111.6		70-130	%	03-DEC-19	21-DEC-19	R4953041
Surrogate: 3,4-Dichlorotoluene (SS)	74.0		70-130	%	03-DEC-19	21-DEC-19	R4953041
Surrogate: 4-Bromofluorobenzene (SS)	95.3		70-130	%	03-DEC-19	21-DEC-19	R4953041
L2394273-3 TH19-07 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	12.8		0.10	%		11-DEC-19	R4941938
F4G-SG	1760		500	mg/kg		17-DEC-19	R4945332
Extractable Organic Halides (EOX)	See Attached					30-DEC-19	R5017777
Metals in Soil by CRC ICPMS							
Aluminum (Al)	971		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Antimony (Sb)	<0.10		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Arsenic (As)	0.61		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Barium (Ba)	7.36		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Beryllium (Be)	<0.10		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Boron (B)	11.5		5.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Bismuth (Bi)	<0.20		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cadmium (Cd)	0.020		0.020	mg/kg	20-DEC-19	27-DEC-19	R4957756
Calcium (Ca)	200000		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Chromium (Cr)	2.39		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cobalt (Co)	1.04		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Copper (Cu)	2.83		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Iron (Fe)	2390		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lead (Pb)	1.48		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lithium (Li)	3.3		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Magnesium (Mg)	128000		20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Manganese (Mn)	142		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Molybdenum (Mo)	0.24		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Nickel (Ni)	2.21		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Phosphorus (P)	56		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Potassium (K)	350		100	mg/kg	20-DEC-19	27-DEC-19	R4957756
Selenium (Se)	<0.20		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Silver (Ag)	<0.10		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sodium (Na)	61		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Strontium (Sr)	37.7		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sulfur (S)	1000		1000	mg/kg	20-DEC-19	27-DEC-19	R4957756

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-3 TH19-07 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Metals in Soil by CRC ICPMS							
Thallium (Tl)	<0.050		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tin (Sn)	<2.0		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Titanium (Ti)	21.4		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tungsten (W)	<0.50		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Uranium (U)	0.236		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Vanadium (V)	5.14		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zinc (Zn)	6.0		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zirconium (Zr)	1.4		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
2-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Acenaphthene	<0.0050		0.0050	mg/kg	18-DEC-19	20-DEC-19	R4948769
Acenaphthylene	<0.0050		0.0050	mg/kg	18-DEC-19	20-DEC-19	R4948769
Acridine	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Anthracene	<0.0040		0.0040	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(a)anthracene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(a)pyrene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(b&j)fluoranthene	0.015	EMPC	0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Chrysene	0.049	EMPC	0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	18-DEC-19	20-DEC-19	R4948769
Fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Fluorene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Phenanthrene	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Pyrene	0.018		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
Quinoline	<0.010		0.010	mg/kg	18-DEC-19	20-DEC-19	R4948769
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	18-DEC-19	20-DEC-19	R4948769
IACR (CCME)	0.19		0.15		18-DEC-19	20-DEC-19	R4948769
Benzo(b+j+k)fluoranthene	0.015		0.014	mg/kg	18-DEC-19	20-DEC-19	R4948769
Surrogate: Acenaphthene d10	119.7		60-130	%	18-DEC-19	20-DEC-19	R4948769
Surrogate: Chrysene d12	108.8		60-130	%	18-DEC-19	20-DEC-19	R4948769
Surrogate: Naphthalene d8	120.2		50-130	%	18-DEC-19	20-DEC-19	R4948769
Surrogate: Phenanthrene d10	105.0		60-130	%	18-DEC-19	20-DEC-19	R4948769
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1221	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1232	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1242	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1248	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1254	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1260	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1262	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1268	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Total PCBs	<0.050		0.050	mg/kg		17-DEC-19	R4944999
Surrogate: Decachlorobiphenyl	68.2		65-130	%		17-DEC-19	R4944999
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<130	DLM	130	mg/kg	13-DEC-19	14-DEC-19	R4943247
F3 (C16-C34)	480	DLM	250	mg/kg	13-DEC-19	14-DEC-19	R4943247

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-3 TH19-07 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
CCME Total Extractable Hydrocarbons							
F4 (C34-C50)	500	DLM	250	mg/kg	13-DEC-19	14-DEC-19	R4943247
Surrogate: 2-Bromobenzotrifluoride	79.7		60-140	%	13-DEC-19	14-DEC-19	R4943247
Chrom. to baseline at nC50	NO				13-DEC-19	14-DEC-19	R4943247
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		23-DEC-19	
F2-Naphth	<130		130	mg/kg		23-DEC-19	
F3-PAH	480		250	mg/kg		23-DEC-19	
Total Hydrocarbons (C6-C50)	980		380	mg/kg		23-DEC-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		23-DEC-19	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
Benzene	<0.0050		0.0050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromobenzene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromochloromethane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromodichloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromoform	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromomethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
n-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
sec-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
tert-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Carbon disulfide	<0.25		0.25	mg/kg	03-DEC-19	21-DEC-19	R4953041
Carbon Tetrachloride	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloroform	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
4-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dibromochloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dibromoethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dibromomethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dichlorodifluoromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dichloromethane	0.18		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2,2-Dichloropropane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Ethylbenzene	<0.015		0.015	mg/kg	03-DEC-19	21-DEC-19	R4953041
F1	<10		10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Hexachlorobutadiene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-3 TH19-07 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Hexane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
Isopropylbenzene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
4-Isopropyltoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
MEK	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
MIBK	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
MTBE	<0.20		0.20	mg/kg	03-DEC-19	21-DEC-19	R4953041
Styrene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Tetrachloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Toluene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Trichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Trichlorofluoromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Vinyl Chloride	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
M+P-Xylenes	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
o-Xylene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Surrogate: 1,4-Difluorobenzene (SS)	122.1		70-130	%	03-DEC-19	21-DEC-19	R4953041
Surrogate: 3,4-Dichlorotoluene (SS)	108.2		70-130	%	03-DEC-19	21-DEC-19	R4953041
Surrogate: 4-Bromofluorobenzene (SS)	109.1		70-130	%	03-DEC-19	21-DEC-19	R4953041
L2394273-4 TH19-07 @ 1.5M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Miscellaneous Parameters							
Moisture	26.4		0.10	%		11-DEC-19	R4941938
Extractable Organic Halides (EOX)	See Attached					30-DEC-19	R5017777
Metals in Soil by CRC ICPMS							
Aluminum (Al)	13800		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Antimony (Sb)	0.52		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Arsenic (As)	9.03		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Barium (Ba)	172		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Beryllium (Be)	0.66		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Boron (B)	6.9		5.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Bismuth (Bi)	<0.20		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cadmium (Cd)	0.286		0.020	mg/kg	20-DEC-19	27-DEC-19	R4957756
Calcium (Ca)	74900		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Chromium (Cr)	20.9		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Cobalt (Co)	8.22		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Copper (Cu)	21.3		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Iron (Fe)	20900		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lead (Pb)	10.1		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Lithium (Li)	19.6		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Magnesium (Mg)	28300		20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Manganese (Mn)	580		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-4 TH19-07 @ 1.5M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Metals in Soil by CRC ICPMS							
Molybdenum (Mo)	0.80		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Nickel (Ni)	24.2		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Phosphorus (P)	578		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Potassium (K)	1530		100	mg/kg	20-DEC-19	27-DEC-19	R4957756
Selenium (Se)	<0.20		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Silver (Ag)	0.11		0.10	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sodium (Na)	493		50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Strontium (Sr)	109		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Sulfur (S)	<1000		1000	mg/kg	20-DEC-19	27-DEC-19	R4957756
Thallium (Tl)	0.232		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tin (Sn)	<2.0		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Titanium (Ti)	64.5		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Tungsten (W)	<0.50		0.50	mg/kg	20-DEC-19	27-DEC-19	R4957756
Uranium (U)	1.86		0.050	mg/kg	20-DEC-19	27-DEC-19	R4957756
Vanadium (V)	40.0		0.20	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zinc (Zn)	60.1		2.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Zirconium (Zr)	6.4		1.0	mg/kg	20-DEC-19	27-DEC-19	R4957756
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
2-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthylene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acridine	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Anthracene	<0.0040		0.0040	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)anthracene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Chrysene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluorene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Phenanthrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Quinoline	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	18-DEC-19	19-DEC-19	R4948769
IACR (CCME)	<0.15		0.15		18-DEC-19	19-DEC-19	R4948769
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	18-DEC-19	19-DEC-19	R4948769
Surrogate: Acenaphthene d10	105.5		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Chrysene d12	122.6		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Naphthalene d8	114.1		50-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Phenanthrene d10	110.2		60-130	%	18-DEC-19	19-DEC-19	R4948769
PCBs							
Aroclor 1016	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1221	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1232	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1242	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1248	<0.010		0.010	mg/kg		17-DEC-19	R4944999

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-4 TH19-07 @ 1.5M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
PCBs							
Aroclor 1254	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1260	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1262	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Aroclor 1268	<0.010		0.010	mg/kg		17-DEC-19	R4944999
Total PCBs	<0.050		0.050	mg/kg		17-DEC-19	R4944999
Surrogate: Decachlorobiphenyl	77.1		65-130	%		17-DEC-19	R4944999
VOC plus F1-F4 by Tumbler							
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	13-DEC-19	14-DEC-19	R4943247
F3 (C16-C34)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
F4 (C34-C50)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
Surrogate: 2-Bromobenzotrifluoride	78.6		60-140	%	13-DEC-19	14-DEC-19	R4943247
Chrom. to baseline at nC50	YES				13-DEC-19	14-DEC-19	R4943247
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		23-DEC-19	
F2-Naphth	<25		25	mg/kg		23-DEC-19	
F3-PAH	<50		50	mg/kg		23-DEC-19	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		23-DEC-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		23-DEC-19	
VOC plus F1 by GCMS							
Acetone	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
Benzene	<0.0050		0.0050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromobenzene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromochloromethane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromodichloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromoform	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Bromomethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
n-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
sec-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
tert-Butylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Carbon disulfide	<0.25		0.25	mg/kg	03-DEC-19	21-DEC-19	R4953041
Carbon Tetrachloride	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloroform	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Chloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
4-Chlorotoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dibromochloromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dibromo-3-chloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dibromoethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dibromomethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,4-Dichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Dichlorodifluoromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
cis-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
trans-1,2-Dichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-4 TH19-07 @ 1.5M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
VOC plus F1 by GCMS							
Dichloromethane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3-Dichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2,2-Dichloropropane	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
cis-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
trans-1,3-Dichloropropene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Ethylbenzene	<0.015		0.015	mg/kg	03-DEC-19	21-DEC-19	R4953041
F1	<10		10	mg/kg	03-DEC-19	21-DEC-19	R4953041
Hexachlorobutadiene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Hexane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
2-Hexanone (Methyl butyl ketone)	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
Isopropylbenzene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
4-Isopropyltoluene	<0.10		0.10	mg/kg	03-DEC-19	21-DEC-19	R4953041
MEK	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
MIBK	<0.50		0.50	mg/kg	03-DEC-19	21-DEC-19	R4953041
MTBE	<0.20		0.20	mg/kg	03-DEC-19	21-DEC-19	R4953041
Styrene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,1,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,2,2-Tetrachloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Tetrachloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Toluene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,3-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,4-Trichlorobenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,1-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,1,2-Trichloroethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Trichloroethene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Trichlorofluoromethane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,3-Trichloropropane	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,2,4-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
1,3,5-Trimethylbenzene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Vinyl Chloride	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
M+P-Xylenes	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
o-Xylene	<0.050		0.050	mg/kg	03-DEC-19	21-DEC-19	R4953041
Surrogate: 1,4-Difluorobenzene (SS)	113.1		70-130	%	03-DEC-19	21-DEC-19	R4953041
Surrogate: 3,4-Dichlorotoluene (SS)	101.1		70-130	%	03-DEC-19	21-DEC-19	R4953041
Surrogate: 4-Bromofluorobenzene (SS)	103.6		70-130	%	03-DEC-19	21-DEC-19	R4953041
L2394273-5 TH19-08 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
BTEX and F1-F4 by Tumbler Method							
BTX plus F1 by GCMS							
Benzene	<0.0050		0.0050	mg/kg	03-DEC-19	12-DEC-19	R4942491
Toluene	<0.050		0.050	mg/kg	03-DEC-19	12-DEC-19	R4942491
Ethyl benzene	<0.015		0.015	mg/kg	03-DEC-19	12-DEC-19	R4942491
o-Xylene	<0.050		0.050	mg/kg	03-DEC-19	12-DEC-19	R4942491
m+p-Xylenes	<0.050		0.050	mg/kg	03-DEC-19	12-DEC-19	R4942491
F1 (C6-C10)	<10		10	mg/kg	03-DEC-19	12-DEC-19	R4942491
Surrogate: 4-Bromofluorobenzene (SS)	95.6		70-130	%	03-DEC-19	12-DEC-19	R4942491
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	13-DEC-19	14-DEC-19	R4943247

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-5 TH19-08 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
CCME Total Extractable Hydrocarbons							
F3 (C16-C34)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
F4 (C34-C50)	52		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
Surrogate: 2-Bromobenzotrifluoride	77.2		60-140	%	13-DEC-19	14-DEC-19	R4943247
Chrom. to baseline at nC50	YES				13-DEC-19	14-DEC-19	R4943247
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		20-DEC-19	
F2-Naphth	<25		25	mg/kg		20-DEC-19	
F3-PAH	<50		50	mg/kg		20-DEC-19	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		20-DEC-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		13-DEC-19	
Miscellaneous Parameters							
Moisture	30.8		0.10	%		11-DEC-19	R4941938
Metals in Soil by CRC ICPMS							
Aluminum (Al)	15700		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Antimony (Sb)	0.46		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Arsenic (As)	5.52		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Barium (Ba)	311		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Beryllium (Be)	0.82		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Boron (B)	11.0		5.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Bismuth (Bi)	<0.20		0.20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Cadmium (Cd)	0.213		0.020	mg/kg	16-DEC-19	23-DEC-19	R4953431
Calcium (Ca)	98200		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Chromium (Cr)	26.6		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Cobalt (Co)	9.89		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Copper (Cu)	23.0		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Iron (Fe)	20100		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Lead (Pb)	11.0		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Lithium (Li)	21.6		2.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Magnesium (Mg)	59300		20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Manganese (Mn)	430		1.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Molybdenum (Mo)	1.08		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Nickel (Ni)	27.4		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Phosphorus (P)	398		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Potassium (K)	2840		100	mg/kg	16-DEC-19	23-DEC-19	R4953431
Selenium (Se)	0.36		0.20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Silver (Ag)	<0.10		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Sodium (Na)	344		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Strontium (Sr)	68.5		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Sulfur (S)	<1000		1000	mg/kg	16-DEC-19	23-DEC-19	R4953431
Thallium (Tl)	0.214		0.050	mg/kg	16-DEC-19	23-DEC-19	R4953431
Tin (Sn)	<2.0		2.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Titanium (Ti)	82.4		1.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Tungsten (W)	<0.50		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Uranium (U)	1.26		0.050	mg/kg	16-DEC-19	23-DEC-19	R4953431
Vanadium (V)	43.9		0.20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Zinc (Zn)	72.5		2.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Zirconium (Zr)	8.3		1.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
2-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-5 TH19-08 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthylene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acridine	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Anthracene	<0.0040		0.0040	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)anthracene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Chrysene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluorene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Phenanthrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Quinoline	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	18-DEC-19	19-DEC-19	R4948769
IACR (CCME)	<0.15		0.15		18-DEC-19	19-DEC-19	R4948769
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	18-DEC-19	19-DEC-19	R4948769
Surrogate: Acenaphthene d10	107.6		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Chrysene d12	122.9		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Naphthalene d8	87.0		50-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Phenanthrene d10	109.1		60-130	%	18-DEC-19	19-DEC-19	R4948769
L2394273-6 TH19-10 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
BTEX and F1-F4 by Tumbler Method							
BTX plus F1 by GCMS							
Benzene	<0.0050		0.0050	mg/kg	03-DEC-19	12-DEC-19	R4942491
Toluene	<0.050		0.050	mg/kg	03-DEC-19	12-DEC-19	R4942491
Ethyl benzene	<0.015		0.015	mg/kg	03-DEC-19	12-DEC-19	R4942491
o-Xylene	<0.050		0.050	mg/kg	03-DEC-19	12-DEC-19	R4942491
m+p-Xylenes	<0.050		0.050	mg/kg	03-DEC-19	12-DEC-19	R4942491
F1 (C6-C10)	<10		10	mg/kg	03-DEC-19	12-DEC-19	R4942491
Surrogate: 4-Bromofluorobenzene (SS)	93.2		70-130	%	03-DEC-19	12-DEC-19	R4942491
CCME Total Extractable Hydrocarbons							
F2 (C10-C16)	<25		25	mg/kg	13-DEC-19	14-DEC-19	R4943247
F3 (C16-C34)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
F4 (C34-C50)	<50		50	mg/kg	13-DEC-19	14-DEC-19	R4943247
Surrogate: 2-Bromobenzotrifluoride	79.6		60-140	%	13-DEC-19	14-DEC-19	R4943247
Chrom. to baseline at nC50	YES				13-DEC-19	14-DEC-19	R4943247
CCME Total Hydrocarbons							
F1-BTEX	<10		10	mg/kg		20-DEC-19	
F2-Naphth	<25		25	mg/kg		20-DEC-19	
F3-PAH	<50		50	mg/kg		20-DEC-19	
Total Hydrocarbons (C6-C50)	<76		76	mg/kg		20-DEC-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.071		0.071	mg/kg		17-DEC-19	
Miscellaneous Parameters							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-6 TH19-10 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Moisture	26.2		0.10	%		13-DEC-19	R4943683
Metals in Soil by CRC ICPMS							
Aluminum (Al)	23900		5000	mg/kg	16-DEC-19	23-DEC-19	R4953431
Antimony (Sb)	0.68		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Arsenic (As)	5.22		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Barium (Ba)	176		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Beryllium (Be)	1.04		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Boron (B)	17.8		5.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Bismuth (Bi)	0.22		0.20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Cadmium (Cd)	0.441		0.020	mg/kg	16-DEC-19	23-DEC-19	R4953431
Calcium (Ca)	66000		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Chromium (Cr)	38.3		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Cobalt (Co)	11.7		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Copper (Cu)	34.9		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Iron (Fe)	25000		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Lead (Pb)	44.8		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Lithium (Li)	29.6		2.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Magnesium (Mg)	44500		20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Manganese (Mn)	748		1.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Molybdenum (Mo)	0.42		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Nickel (Ni)	32.8		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Phosphorus (P)	450		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Potassium (K)	4010		100	mg/kg	16-DEC-19	23-DEC-19	R4953431
Selenium (Se)	<0.20		0.20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Silver (Ag)	0.12		0.10	mg/kg	16-DEC-19	23-DEC-19	R4953431
Sodium (Na)	327		50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Strontium (Sr)	62.4		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Sulfur (S)	<1000		1000	mg/kg	16-DEC-19	23-DEC-19	R4953431
Thallium (Tl)	0.258		0.050	mg/kg	16-DEC-19	23-DEC-19	R4953431
Tin (Sn)	2.1		2.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Titanium (Ti)	150		1.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Tungsten (W)	<0.50		0.50	mg/kg	16-DEC-19	23-DEC-19	R4953431
Uranium (U)	0.790		0.050	mg/kg	16-DEC-19	23-DEC-19	R4953431
Vanadium (V)	59.2		0.20	mg/kg	16-DEC-19	23-DEC-19	R4953431
Zinc (Zn)	142		2.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Zirconium (Zr)	6.1		1.0	mg/kg	16-DEC-19	23-DEC-19	R4953431
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
2-Methyl Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acenaphthylene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Acridine	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Anthracene	<0.0040		0.0040	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)anthracene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(a)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(b&j)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(g,h,i)perylene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Benzo(k)fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Chrysene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Dibenzo(a,h)anthracene	<0.0050		0.0050	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluoranthene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Fluorene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2394273-6 TH19-10 @ 0.8M							
Sampled By: CLIENT on 03-DEC-19							
Matrix: SOIL							
Polyaromatic Hydrocarbons (PAHs)							
Indeno(1,2,3-cd)pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Naphthalene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Phenanthrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Pyrene	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
Quinoline	<0.010		0.010	mg/kg	18-DEC-19	19-DEC-19	R4948769
B(a)P Total Potency Equivalent	<0.020		0.020	mg/kg	18-DEC-19	19-DEC-19	R4948769
IACR (CCME)	<0.15		0.15		18-DEC-19	19-DEC-19	R4948769
Benzo(b+j+k)fluoranthene	<0.014		0.014	mg/kg	18-DEC-19	19-DEC-19	R4948769
Surrogate: Acenaphthene d10	103.8		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Chrysene d12	108.9		60-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Naphthalene d8	109.4		50-130	%	18-DEC-19	19-DEC-19	R4948769
Surrogate: Phenanthrene d10	106.7		60-130	%	18-DEC-19	19-DEC-19	R4948769

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTEXS+F1-HSMS-WP	Soil	BTX plus F1 by GCMS	EPA 8260C

The soil methanol extract is added to water and reagents, then heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

EOX-MP	Misc.	Extractable Organic Halides (EOX)	SEE SUBLET LAB REPORT

The material is extracted with ethyl acetate then the extract is analyzed on the TOX (Total Organic Halides) instrument.

F1-F4-CALC-WP	Soil	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-TMB-FID-WP	Soil	CCME Total Extractable Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001

A soil or sediment sample is extracted with 1:1 hexane/acetone in a tumbler, followed by a silica gel clean up to facilitate separation of the hydrocarbons from other polar extractions. An aliquot of the solvent is analyzed using a gas chromatograph equipped with a flame -ionization detector.

F4G-TMB-WP	Soil	CCME Gravimetric Heavy Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-S

A soil or sediment sample is extracted with 1:1 hexane/acetone in a tumbler, followed by a silica gel clean up to facilitate separation of the hydrocarbons from other polar extractions. An aliquot of the solvent is analyzed using gravimetric method

MET-200.2-CCMS-WP	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020B (mod)

Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.

Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.

MOISTURE-WP	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)

Moisture content in solid matrices is determined gravimetrically after drying to constant weight at 105°C.

PAH,PANH-WP	Soil	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Samples are rotary extracted using a 1:1 mixture of acetone and dichloromethane. Extracts are concentrated and solvent exchanged to toluene. The toluene extract is analyzed by GCMS.			
PCB-ED	Soil	PCBs	EPA 3570/8082-GC-ECD
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).			
VOC+F1-HSMS-WP	Soil	VOC plus F1 by GCMS	EPA 8260C
The soil methanol extract is added to water and reagents, then heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.			
XYLENES-SUM-CALC-WP	Soil	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
MP	ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: Wood Environment & Infrastructure Solutions (Winnipeg)
440 Dovercourt Drive
Winnipeg MB R3Y 1G4
Contact: KEVIN BEECHINOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	**Soil**							
Batch R4942491								
WG3240193-2 LCS								
Benzene			94.4		%		70-130	12-DEC-19
Toluene			101.5		%		70-130	12-DEC-19
Ethyl benzene			110.8		%		70-130	12-DEC-19
o-Xylene			116.4		%		70-130	12-DEC-19
m+p-Xylenes			110.8		%		70-130	12-DEC-19
WG3240193-3 LCS								
F1 (C6-C10)			74.5		%		70-130	12-DEC-19
WG3240193-1 MB								
Benzene			<0.0050		mg/kg		0.005	12-DEC-19
Toluene			<0.050		mg/kg		0.05	12-DEC-19
Ethyl benzene			<0.015		mg/kg		0.015	12-DEC-19
o-Xylene			<0.050		mg/kg		0.05	12-DEC-19
m+p-Xylenes			<0.050		mg/kg		0.05	12-DEC-19
F1 (C6-C10)			<10		mg/kg		10	12-DEC-19
Surrogate: 4-Bromofluorobenzene (SS)			90.9		%		70-130	12-DEC-19
F2-F4-TMB-FID-WP	**Soil**							
Batch R4943247								
WG3241707-3 IRM		**ALS PHC RM3**						
F2 (C10-C16)			86.1		%		70-130	14-DEC-19
F3 (C16-C34)			84.9		%		70-130	14-DEC-19
F4 (C34-C50)			80.4		%		70-130	14-DEC-19
WG3241707-2 LCS								
F2 (C10-C16)			93.6		%		70-130	14-DEC-19
F3 (C16-C34)			89.6		%		70-130	14-DEC-19
F4 (C34-C50)			90.5		%		70-130	14-DEC-19
WG3241707-1 MB								
F2 (C10-C16)			<25		mg/kg		25	14-DEC-19
F3 (C16-C34)			<50		mg/kg		50	14-DEC-19
F4 (C34-C50)			<50		mg/kg		50	14-DEC-19
Surrogate: 2-Bromobenzotrifluoride			75.6		%		60-140	14-DEC-19
F4G-TMB-WP	**Soil**							
Batch R4945332								
WG3245249-2 IRM		**ALS PHC RM3**						
F4G-SG			85.1		%		70-130	17-DEC-19
WG3245249-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F4G-TMB-WP	**Soil**							
Batch R4945332								
WG3245249-1 MB								
F4G-SG			<500		mg/kg		500	17-DEC-19
MET-200.2-CCMS-WP	**Soil**							
Batch R4953431								
WG3243514-4 CRM		**CANMET TILL-1**						
Aluminum (Al)			111.5		%		70-130	23-DEC-19
Antimony (Sb)			104.8		%		70-130	23-DEC-19
Arsenic (As)			101.8		%		70-130	23-DEC-19
Barium (Ba)			99.4		%		70-130	23-DEC-19
Beryllium (Be)			107.6		%		70-130	23-DEC-19
Boron (B)			0.7		mg/kg		0-8.2	23-DEC-19
Bismuth (Bi)			102.8		%		70-130	23-DEC-19
Cadmium (Cd)			106.0		%		70-130	23-DEC-19
Calcium (Ca)			91.6		%		70-130	23-DEC-19
Chromium (Cr)			96.3		%		70-130	23-DEC-19
Cobalt (Co)			100.1		%		70-130	23-DEC-19
Copper (Cu)			111.7		%		70-130	23-DEC-19
Iron (Fe)			99.2		%		70-130	23-DEC-19
Lead (Pb)			104.2		%		70-130	23-DEC-19
Lithium (Li)			100.3		%		70-130	23-DEC-19
Magnesium (Mg)			104.6		%		70-130	23-DEC-19
Manganese (Mn)			112.4		%		70-130	23-DEC-19
Molybdenum (Mo)			101.7		%		70-130	23-DEC-19
Nickel (Ni)			100.7		%		70-130	23-DEC-19
Phosphorus (P)			102.7		%		70-130	23-DEC-19
Potassium (K)			77.5		%		70-130	23-DEC-19
Selenium (Se)			0.29		mg/kg		0.12-0.52	23-DEC-19
Silver (Ag)			0.26		mg/kg		0.12-0.32	23-DEC-19
Sodium (Na)			78.5		%		70-130	23-DEC-19
Strontium (Sr)			89.8		%		70-130	23-DEC-19
Thallium (Tl)			0.117		mg/kg		0.075-0.175	23-DEC-19
Tin (Sn)			1.0		mg/kg		0-3.1	23-DEC-19
Titanium (Ti)			84.4		%		70-130	23-DEC-19
Tungsten (W)			0.14		mg/kg		0-0.66	23-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4953431								
WG3243514-4 CRM		**CANMET TILL-1**						
Uranium (U)			97.0		%		70-130	23-DEC-19
Vanadium (V)			97.1		%		70-130	23-DEC-19
Zinc (Zn)			103.8		%		70-130	23-DEC-19
Zirconium (Zr)			0.7		mg/kg		0-1.8	23-DEC-19
WG3243514-2 LCS								
Aluminum (Al)			105.1		%		80-120	23-DEC-19
Antimony (Sb)			107.5		%		80-120	23-DEC-19
Arsenic (As)			104.1		%		80-120	23-DEC-19
Barium (Ba)			104.8		%		80-120	23-DEC-19
Beryllium (Be)			109.2		%		80-120	23-DEC-19
Boron (B)			103.6		%		80-120	23-DEC-19
Bismuth (Bi)			104.1		%		80-120	23-DEC-19
Cadmium (Cd)			105.1		%		80-120	23-DEC-19
Calcium (Ca)			104.6		%		80-120	23-DEC-19
Chromium (Cr)			102.9		%		80-120	23-DEC-19
Cobalt (Co)			104.7		%		80-120	23-DEC-19
Copper (Cu)			106.2		%		80-120	23-DEC-19
Iron (Fe)			96.4		%		80-120	23-DEC-19
Lead (Pb)			105.5		%		80-120	23-DEC-19
Lithium (Li)			107.8		%		80-120	23-DEC-19
Magnesium (Mg)			111.4		%		80-120	23-DEC-19
Manganese (Mn)			104.6		%		80-120	23-DEC-19
Molybdenum (Mo)			106.4		%		80-120	23-DEC-19
Nickel (Ni)			103.3		%		80-120	23-DEC-19
Phosphorus (P)			106.2		%		80-120	23-DEC-19
Potassium (K)			106.2		%		80-120	23-DEC-19
Selenium (Se)			108.7		%		80-120	23-DEC-19
Silver (Ag)			104.7		%		80-120	23-DEC-19
Sodium (Na)			107.1		%		80-120	23-DEC-19
Strontium (Sr)			103.8		%		80-120	23-DEC-19
Sulfur (S)			109.3		%		70-130	23-DEC-19
Thallium (Tl)			105.2		%		80-120	23-DEC-19
Tin (Sn)			104.9		%		80-120	23-DEC-19
Titanium (Ti)			102.2		%		80-120	23-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4953431								
WG3243514-2 LCS								
Tungsten (W)			108.3		%		70-130	23-DEC-19
Uranium (U)			108.2		%		80-120	23-DEC-19
Vanadium (V)			105.1		%		80-120	23-DEC-19
Zinc (Zn)			105.6		%		80-120	23-DEC-19
Zirconium (Zr)			99.4		%		80-120	23-DEC-19
WG3243514-1 MB								
Aluminum (Al)			<50		mg/kg		50	23-DEC-19
Antimony (Sb)			<0.10		mg/kg		0.1	23-DEC-19
Arsenic (As)			<0.10		mg/kg		0.1	23-DEC-19
Barium (Ba)			<0.50		mg/kg		0.5	23-DEC-19
Beryllium (Be)			<0.10		mg/kg		0.1	23-DEC-19
Boron (B)			<5.0		mg/kg		5	23-DEC-19
Bismuth (Bi)			<0.20		mg/kg		0.2	23-DEC-19
Cadmium (Cd)			<0.020		mg/kg		0.02	23-DEC-19
Calcium (Ca)			<50		mg/kg		50	23-DEC-19
Chromium (Cr)			<0.50		mg/kg		0.5	23-DEC-19
Cobalt (Co)			<0.10		mg/kg		0.1	23-DEC-19
Copper (Cu)			<0.50		mg/kg		0.5	23-DEC-19
Iron (Fe)			<50		mg/kg		50	23-DEC-19
Lead (Pb)			<0.50		mg/kg		0.5	23-DEC-19
Lithium (Li)			<2.0		mg/kg		2	23-DEC-19
Magnesium (Mg)			<20		mg/kg		20	23-DEC-19
Manganese (Mn)			<1.0		mg/kg		1	23-DEC-19
Molybdenum (Mo)			<0.10		mg/kg		0.1	23-DEC-19
Nickel (Ni)			<0.50		mg/kg		0.5	23-DEC-19
Phosphorus (P)			<50		mg/kg		50	23-DEC-19
Potassium (K)			<100		mg/kg		100	23-DEC-19
Selenium (Se)			<0.20		mg/kg		0.2	23-DEC-19
Silver (Ag)			<0.10		mg/kg		0.1	23-DEC-19
Sodium (Na)			<50		mg/kg		50	23-DEC-19
Strontium (Sr)			<0.50		mg/kg		0.5	23-DEC-19
Sulfur (S)			<1000		mg/kg		1000	23-DEC-19
Thallium (Tl)			<0.050		mg/kg		0.05	23-DEC-19
Tin (Sn)			<2.0		mg/kg		2	23-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4953431								
WG3243514-1 MB								
Titanium (Ti)			<1.0		mg/kg		1	23-DEC-19
Tungsten (W)			<0.50		mg/kg		0.5	23-DEC-19
Uranium (U)			<0.050		mg/kg		0.05	23-DEC-19
Vanadium (V)			<0.20		mg/kg		0.2	23-DEC-19
Zinc (Zn)			<2.0		mg/kg		2	23-DEC-19
Zirconium (Zr)			<1.0		mg/kg		1	23-DEC-19
Batch R4957756								
WG3247479-4 CRM		**CANMET TILL-1**						
Aluminum (Al)			107.3		%		70-130	27-DEC-19
Antimony (Sb)			98.7		%		70-130	27-DEC-19
Arsenic (As)			97.9		%		70-130	27-DEC-19
Barium (Ba)			100.3		%		70-130	27-DEC-19
Beryllium (Be)			97.9		%		70-130	27-DEC-19
Boron (B)			1.5		mg/kg		0-8.2	27-DEC-19
Bismuth (Bi)			106.3		%		70-130	27-DEC-19
Cadmium (Cd)			100.3		%		70-130	27-DEC-19
Calcium (Ca)			88.2		%		70-130	27-DEC-19
Chromium (Cr)			93.4		%		70-130	27-DEC-19
Cobalt (Co)			94.8		%		70-130	27-DEC-19
Copper (Cu)			98.7		%		70-130	27-DEC-19
Iron (Fe)			97.4		%		70-130	27-DEC-19
Lead (Pb)			100.0		%		70-130	27-DEC-19
Lithium (Li)			94.8		%		70-130	27-DEC-19
Magnesium (Mg)			105.0		%		70-130	27-DEC-19
Manganese (Mn)			107.4		%		70-130	27-DEC-19
Molybdenum (Mo)			101.9		%		70-130	27-DEC-19
Nickel (Ni)			93.9		%		70-130	27-DEC-19
Phosphorus (P)			99.3		%		70-130	27-DEC-19
Potassium (K)			77.5		%		70-130	27-DEC-19
Selenium (Se)			0.33		mg/kg		0.12-0.52	27-DEC-19
Silver (Ag)			0.23		mg/kg		0.12-0.32	27-DEC-19
Sodium (Na)			65.0	MES	%		70-130	27-DEC-19
Strontium (Sr)			92.8		%		70-130	27-DEC-19
Thallium (Tl)			0.116		mg/kg		0.075-0.175	27-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4957756								
WG3247479-4 CRM		**CANMET TILL-1**						
Tin (Sn)			0.9		mg/kg		0-3.1	27-DEC-19
Titanium (Ti)			72.8		%		70-130	27-DEC-19
Tungsten (W)			0.11		mg/kg		0-0.66	27-DEC-19
Uranium (U)			99.2		%		70-130	27-DEC-19
Vanadium (V)			91.7		%		70-130	27-DEC-19
Zinc (Zn)			94.8		%		70-130	27-DEC-19
Zirconium (Zr)			0.6		mg/kg		0-1.8	27-DEC-19
WG3247479-2 LCS								
Aluminum (Al)			103.7		%		80-120	27-DEC-19
Antimony (Sb)			105.5		%		80-120	27-DEC-19
Arsenic (As)			100.9		%		80-120	27-DEC-19
Barium (Ba)			98.4		%		80-120	27-DEC-19
Beryllium (Be)			102.3		%		80-120	27-DEC-19
Boron (B)			97.2		%		80-120	27-DEC-19
Bismuth (Bi)			101.6		%		80-120	27-DEC-19
Cadmium (Cd)			98.6		%		80-120	27-DEC-19
Calcium (Ca)			99.8		%		80-120	27-DEC-19
Chromium (Cr)			99.6		%		80-120	27-DEC-19
Cobalt (Co)			98.4		%		80-120	27-DEC-19
Copper (Cu)			98.6		%		80-120	27-DEC-19
Iron (Fe)			87.8		%		80-120	27-DEC-19
Lead (Pb)			101.6		%		80-120	27-DEC-19
Lithium (Li)			101.2		%		80-120	27-DEC-19
Magnesium (Mg)			112.5		%		80-120	27-DEC-19
Manganese (Mn)			101.6		%		80-120	27-DEC-19
Molybdenum (Mo)			106.3		%		80-120	27-DEC-19
Nickel (Ni)			96.7		%		80-120	27-DEC-19
Phosphorus (P)			106.1		%		80-120	27-DEC-19
Potassium (K)			105.8		%		80-120	27-DEC-19
Selenium (Se)			97.8		%		80-120	27-DEC-19
Silver (Ag)			103.1		%		80-120	27-DEC-19
Sodium (Na)			101.0		%		80-120	27-DEC-19
Strontium (Sr)			112.4		%		80-120	27-DEC-19
Sulfur (S)			99.6		%		70-130	27-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4957756								
WG3247479-2 LCS								
Thallium (Tl)			98.9		%		80-120	27-DEC-19
Tin (Sn)			99.2		%		80-120	27-DEC-19
Titanium (Ti)			99.9		%		80-120	27-DEC-19
Tungsten (W)			102.2		%		70-130	27-DEC-19
Uranium (U)			105.3		%		80-120	27-DEC-19
Vanadium (V)			100.9		%		80-120	27-DEC-19
Zinc (Zn)			99.3		%		80-120	27-DEC-19
Zirconium (Zr)			102.1		%		80-120	27-DEC-19
WG3247479-1 MB								
Aluminum (Al)			<50		mg/kg		50	27-DEC-19
Antimony (Sb)			<0.10		mg/kg		0.1	27-DEC-19
Arsenic (As)			<0.10		mg/kg		0.1	27-DEC-19
Barium (Ba)			<0.50		mg/kg		0.5	27-DEC-19
Beryllium (Be)			<0.10		mg/kg		0.1	27-DEC-19
Boron (B)			<5.0		mg/kg		5	27-DEC-19
Bismuth (Bi)			<0.20		mg/kg		0.2	27-DEC-19
Cadmium (Cd)			<0.020		mg/kg		0.02	27-DEC-19
Calcium (Ca)			<50		mg/kg		50	27-DEC-19
Chromium (Cr)			<0.50		mg/kg		0.5	27-DEC-19
Cobalt (Co)			<0.10		mg/kg		0.1	27-DEC-19
Copper (Cu)			<0.50		mg/kg		0.5	27-DEC-19
Iron (Fe)			<50		mg/kg		50	27-DEC-19
Lead (Pb)			<0.50		mg/kg		0.5	27-DEC-19
Lithium (Li)			<2.0		mg/kg		2	27-DEC-19
Magnesium (Mg)			<20		mg/kg		20	27-DEC-19
Manganese (Mn)			<1.0		mg/kg		1	27-DEC-19
Molybdenum (Mo)			<0.10		mg/kg		0.1	27-DEC-19
Nickel (Ni)			<0.50		mg/kg		0.5	27-DEC-19
Phosphorus (P)			<50		mg/kg		50	27-DEC-19
Potassium (K)			<100		mg/kg		100	27-DEC-19
Selenium (Se)			<0.20		mg/kg		0.2	27-DEC-19
Silver (Ag)			<0.10		mg/kg		0.1	27-DEC-19
Sodium (Na)			<50		mg/kg		50	27-DEC-19
Strontium (Sr)			<0.50		mg/kg		0.5	27-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WP	**Soil**							
Batch R4957756								
WG3247479-1 MB								
Sulfur (S)			<1000		mg/kg		1000	27-DEC-19
Thallium (Tl)			<0.050		mg/kg		0.05	27-DEC-19
Tin (Sn)			<2.0		mg/kg		2	27-DEC-19
Titanium (Ti)			<1.0		mg/kg		1	27-DEC-19
Tungsten (W)			<0.50		mg/kg		0.5	27-DEC-19
Uranium (U)			<0.050		mg/kg		0.05	27-DEC-19
Vanadium (V)			<0.20		mg/kg		0.2	27-DEC-19
Zinc (Zn)			<2.0		mg/kg		2	27-DEC-19
Zirconium (Zr)			<1.0		mg/kg		1	27-DEC-19
MOISTURE-WP	**Soil**							
Batch R4941938								
WG3239944-5 LCS								
Moisture			100.4		%		90-110	11-DEC-19
WG3239944-4 MB								
Moisture			<0.10		%		0.1	11-DEC-19
Batch R4943683								
WG3241745-2 LCS								
Moisture			100.1		%		90-110	13-DEC-19
WG3241745-1 MB								
Moisture			<0.10		%		0.1	13-DEC-19
PAH,PANH-WP	**Soil**							
Batch R4948769								
WG3246489-3 DUP		**L2394273-1**						
1-Methyl Naphthalene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
2-Methyl Naphthalene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Acenaphthene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	19-DEC-19
Acenaphthylene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	19-DEC-19
Acridine		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Anthracene		<0.0040	<0.0040	RPD-NA	mg/kg	N/A	50	19-DEC-19
Benzo(a)anthracene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Benzo(a)pyrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Benzo(b&j)fluoranthene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Benzo(g,h,i)perylene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Benzo(k)fluoranthene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Chrysene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Soil**							
Batch R4948769								
WG3246489-3 DUP		**L2394273-1**						
Dibenzo(a,h)anthracene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	19-DEC-19
Fluoranthene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Fluorene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Indeno(1,2,3-cd)pyrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Naphthalene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Phenanthrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Pyrene		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
Quinoline		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-DEC-19
WG3246489-4 IRM		**ALS PAH RM2**						
1-Methyl Naphthalene			98.1		%		65-130	19-DEC-19
2-Methyl Naphthalene			103.5		%		65-130	19-DEC-19
Acenaphthene			121.0		%		65-130	19-DEC-19
Acenaphthylene			87.7		%		65-130	19-DEC-19
Anthracene			90.6		%		65-130	19-DEC-19
Benzo(a)anthracene			108.7		%		65-130	19-DEC-19
Benzo(a)pyrene			80.6		%		65-130	19-DEC-19
Benzo(b&j)fluoranthene			75.1		%		65-130	19-DEC-19
Benzo(g,h,i)perylene			94.3		%		65-130	19-DEC-19
Benzo(k)fluoranthene			75.8		%		65-130	19-DEC-19
Chrysene			117.0		%		65-130	19-DEC-19
Dibenzo(a,h)anthracene			94.5		%		65-130	19-DEC-19
Fluoranthene			92.7		%		65-130	19-DEC-19
Fluorene			96.9		%		65-130	19-DEC-19
Indeno(1,2,3-cd)pyrene			85.6		%		65-130	19-DEC-19
Naphthalene			112.3		%		65-130	19-DEC-19
Phenanthrene			94.9		%		65-130	19-DEC-19
Pyrene			101.8		%		65-130	19-DEC-19
WG3246489-2 LCS								
1-Methyl Naphthalene			113.1		%		60-130	19-DEC-19
2-Methyl Naphthalene			109.4		%		60-130	19-DEC-19
Acenaphthene			114.7		%		60-130	19-DEC-19
Acenaphthylene			102.9		%		60-130	19-DEC-19
Acridine			114.3		%		60-130	19-DEC-19
Anthracene			112.9		%		60-130	19-DEC-19
Benzo(a)anthracene			120.4		%		60-130	19-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Soil**							
Batch R4948769								
WG3246489-2 LCS								
Benzo(a)pyrene			101.5		%		60-130	19-DEC-19
Benzo(b&j)fluoranthene			93.4		%		60-130	19-DEC-19
Benzo(g,h,i)perylene			105.1		%		60-130	19-DEC-19
Benzo(k)fluoranthene			110.4		%		60-130	19-DEC-19
Chrysene			117.4		%		60-130	19-DEC-19
Dibenzo(a,h)anthracene			102.1		%		60-130	19-DEC-19
Fluoranthene			111.4		%		60-130	19-DEC-19
Fluorene			105.9		%		60-130	19-DEC-19
Indeno(1,2,3-cd)pyrene			102.4		%		60-130	19-DEC-19
Naphthalene			114.5		%		50-130	19-DEC-19
Phenanthrene			114.6		%		60-130	19-DEC-19
Pyrene			117.5		%		60-130	19-DEC-19
Quinoline			112.2		%		60-130	19-DEC-19
WG3246489-1 MB								
1-Methyl Naphthalene			<0.010		mg/kg		0.01	19-DEC-19
2-Methyl Naphthalene			<0.010		mg/kg		0.01	19-DEC-19
Acenaphthene			<0.0050		mg/kg		0.005	19-DEC-19
Acenaphthylene			<0.0050		mg/kg		0.005	19-DEC-19
Acridine			<0.010		mg/kg		0.01	19-DEC-19
Anthracene			<0.0040		mg/kg		0.004	19-DEC-19
Benzo(a)anthracene			<0.010		mg/kg		0.01	19-DEC-19
Benzo(a)pyrene			<0.010		mg/kg		0.01	19-DEC-19
Benzo(b&j)fluoranthene			<0.010		mg/kg		0.01	19-DEC-19
Benzo(g,h,i)perylene			<0.010		mg/kg		0.01	19-DEC-19
Benzo(k)fluoranthene			<0.010		mg/kg		0.01	19-DEC-19
Chrysene			<0.010		mg/kg		0.01	19-DEC-19
Dibenzo(a,h)anthracene			<0.0050		mg/kg		0.005	19-DEC-19
Fluoranthene			<0.010		mg/kg		0.01	19-DEC-19
Fluorene			<0.010		mg/kg		0.01	19-DEC-19
Indeno(1,2,3-cd)pyrene			<0.010		mg/kg		0.01	19-DEC-19
Naphthalene			<0.010		mg/kg		0.01	19-DEC-19
Phenanthrene			<0.010		mg/kg		0.01	19-DEC-19
Pyrene			<0.010		mg/kg		0.01	19-DEC-19
Quinoline			<0.010		mg/kg		0.01	19-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Soil**							
Batch R4948769								
WG3246489-1 MB								
Surrogate: Acenaphthene d10			92.9		%		60-130	19-DEC-19
Surrogate: Chrysene d12			120.3		%		60-130	19-DEC-19
Surrogate: Naphthalene d8			101.0		%		50-130	19-DEC-19
Surrogate: Phenanthrene d10			101.7		%		60-130	19-DEC-19
PCB-ED	**Soil**							
Batch R4944999								
WG3243253-3 CRM		**PCB_SOIL_CRM915-050**						
Aroclor 1260			73.9		%		65-130	17-DEC-19
WG3243253-4 DUP		**L2394273-4**						
Aroclor 1016		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1221		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1232		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1242		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1248		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1254		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1260		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1262		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
Aroclor 1268		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	17-DEC-19
WG3243253-2 LCS		**LCS_A1016**						
Aroclor 1016			78.7		%		65-130	17-DEC-19
WG3243253-1 MB								
Aroclor 1016			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1221			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1232			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1242			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1248			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1254			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1260			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1262			<0.010		mg/kg		0.01	17-DEC-19
Aroclor 1268			<0.010		mg/kg		0.01	17-DEC-19
Surrogate: Decachlorobiphenyl			83.0		%		65-130	17-DEC-19
VOC+F1-HSMS-WP	**Soil**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4953041								
WG3247019-3 DUP		**L2394273-1**						
Acetone		<0.50	<0.50	RPD-NA	mg/kg	N/A	50	20-DEC-19
Benzene		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Bromobenzene		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
Bromochloromethane		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
Bromodichloromethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Bromoform		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Bromomethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
n-Butylbenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
sec-Butylbenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
tert-Butylbenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Carbon disulfide		<0.25	<0.25	RPD-NA	mg/kg	N/A	50	20-DEC-19
Carbon Tetrachloride		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Chlorobenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Chloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Chloroform		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Chloromethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
2-Chlorotoluene		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
4-Chlorotoluene		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
Dibromochloromethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2-Dibromo-3-chloropropane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Dibromomethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1-dichloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1-dichloroethene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
cis-1,2-Dichloroethene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
trans-1,2-Dichloroethene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Dichloromethane		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,3-Dichloropropane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4953041								
WG3247019-3 DUP		**L2394273-1**						
2,2-Dichloropropane		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1-Dichloropropene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
cis-1,3-Dichloropropene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
trans-1,3-Dichloropropene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Ethylbenzene		<0.015	<0.015	RPD-NA	mg/kg	N/A	50	20-DEC-19
F1		<10	<10	RPD-NA	mg/kg	N/A	50	20-DEC-19
Hexachlorobutadiene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Hexane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
2-Hexanone (Methyl butyl ketone)		<0.50	<0.50	RPD-NA	mg/kg	N/A	50	20-DEC-19
Isopropylbenzene		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
4-Isopropyltoluene		<0.10	<0.10	RPD-NA	mg/kg	N/A	50	20-DEC-19
MEK		<0.50	<0.50	RPD-NA	mg/kg	N/A	50	20-DEC-19
MIBK		<0.50	<0.50	RPD-NA	mg/kg	N/A	50	20-DEC-19
MTBE		<0.20	<0.20	RPD-NA	mg/kg	N/A	50	20-DEC-19
Styrene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Tetrachloroethene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Toluene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2,3-Trichlorobenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2,4-Trichlorobenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Trichloroethene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2,3-Trichloropropane		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,2,4-Trimethylbenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
1,3,5-Trimethylbenzene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
Vinyl Chloride		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
M+P-Xylenes		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
o-Xylene		<0.050	<0.050	RPD-NA	mg/kg	N/A	50	20-DEC-19
WG3247019-2 LCS								
Acetone			107.1		%		70-130	20-DEC-19
Benzene			106.9		%		70-130	20-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4953041								
WG3247019-2 LCS								
Bromobenzene			103.7		%		70-130	20-DEC-19
Bromochloromethane			110.6		%		70-130	20-DEC-19
Bromodichloromethane			107.5		%		70-130	20-DEC-19
Bromoform			109.0		%		70-130	20-DEC-19
Bromomethane			101.7		%		60-140	20-DEC-19
n-Butylbenzene			108.6		%		70-130	20-DEC-19
sec-Butylbenzene			112.0		%		70-130	20-DEC-19
tert-Butylbenzene			107.1		%		70-130	20-DEC-19
Carbon disulfide			111.6		%		70-130	20-DEC-19
Carbon Tetrachloride			111.0		%		70-130	20-DEC-19
Chlorobenzene			110.1		%		70-130	20-DEC-19
Chloroethane			105.1		%		60-140	20-DEC-19
Chloroform			111.3		%		70-130	20-DEC-19
Chloromethane			129.5		%		60-140	20-DEC-19
2-Chlorotoluene			117.0		%		70-130	20-DEC-19
4-Chlorotoluene			108.6		%		70-130	20-DEC-19
Dibromochloromethane			107.5		%		70-130	20-DEC-19
1,2-Dibromo-3-chloropropane			107.1		%		70-130	20-DEC-19
1,2-Dibromoethane			102.4		%		70-130	20-DEC-19
Dibromomethane			111.1		%		70-130	20-DEC-19
1,2-Dichlorobenzene			111.5		%		70-130	20-DEC-19
1,3-Dichlorobenzene			109.2		%		70-130	20-DEC-19
1,4-Dichlorobenzene			114.7		%		70-130	20-DEC-19
Dichlorodifluoromethane			107.1		%		60-140	20-DEC-19
1,1-dichloroethane			107.9		%		70-130	20-DEC-19
1,2-Dichloroethane			107.1		%		70-130	20-DEC-19
1,1-dichloroethene			108.6		%		70-130	20-DEC-19
cis-1,2-Dichloroethene			111.4		%		70-130	20-DEC-19
trans-1,2-Dichloroethene			106.9		%		70-130	20-DEC-19
Dichloromethane			108.9		%		60-140	20-DEC-19
1,2-Dichloropropane			103.3		%		70-130	20-DEC-19
1,3-Dichloropropane			105.1		%		70-130	20-DEC-19
2,2-Dichloropropane			78.9		%		70-130	20-DEC-19
1,1-Dichloropropene			109.8		%		70-130	20-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4953041								
WG3247019-2 LCS								
cis-1,3-Dichloropropene			86.9		%		70-130	20-DEC-19
trans-1,3-Dichloropropene			82.5		%		70-130	20-DEC-19
Ethylbenzene			101.9		%		70-130	20-DEC-19
Hexachlorobutadiene			116.1		%		70-130	20-DEC-19
Hexane			106.5		%		70-130	20-DEC-19
2-Hexanone (Methyl butyl ketone)			96.1		%		70-130	20-DEC-19
Isopropylbenzene			107.7		%		70-130	20-DEC-19
4-Isopropyltoluene			106.9		%		70-130	20-DEC-19
MEK			97.6		%		70-130	20-DEC-19
MIBK			98.8		%		70-130	20-DEC-19
MTBE			107.0		%		70-130	20-DEC-19
Styrene			110.1		%		70-130	20-DEC-19
1,1,1,2-Tetrachloroethane			109.1		%		70-130	20-DEC-19
1,1,2,2-Tetrachloroethane			111.4		%		70-130	20-DEC-19
Tetrachloroethene			112.5		%		70-130	20-DEC-19
Toluene			106.5		%		70-130	20-DEC-19
1,2,3-Trichlorobenzene			105.7		%		70-130	20-DEC-19
1,2,4-Trichlorobenzene			111.3		%		70-130	20-DEC-19
1,1,1-Trichloroethane			110.6		%		70-130	20-DEC-19
1,1,2-Trichloroethane			107.2		%		70-130	20-DEC-19
Trichloroethene			109.0		%		70-130	20-DEC-19
Trichlorofluoromethane			115.4		%		60-140	20-DEC-19
1,2,3-Trichloropropane			108.1		%		70-130	20-DEC-19
1,2,4-Trimethylbenzene			106.4		%		70-130	20-DEC-19
1,3,5-Trimethylbenzene			108.5		%		70-130	20-DEC-19
Vinyl Chloride			124.9		%		60-140	20-DEC-19
M+P-Xylenes			109.8		%		70-130	20-DEC-19
o-Xylene			108.9		%		70-130	20-DEC-19
WG3247019-4 LCS								
F1			125.5		%		70-130	20-DEC-19
WG3247019-1 MB								
Acetone			<0.50		mg/kg		0.5	20-DEC-19
Benzene			<0.0050		mg/kg		0.005	20-DEC-19
Bromobenzene			<0.10		mg/kg		0.1	20-DEC-19
Bromochloromethane			<0.10		mg/kg		0.1	20-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4953041								
WG3247019-1 MB								
Bromodichloromethane			<0.050		mg/kg		0.05	20-DEC-19
Bromoform			<0.050		mg/kg		0.05	20-DEC-19
Bromomethane			<0.050		mg/kg		0.05	20-DEC-19
n-Butylbenzene			<0.050		mg/kg		0.05	20-DEC-19
sec-Butylbenzene			<0.050		mg/kg		0.05	20-DEC-19
tert-Butylbenzene			<0.050		mg/kg		0.05	20-DEC-19
Carbon disulfide			<0.25		mg/kg		0.25	20-DEC-19
Carbon Tetrachloride			<0.050		mg/kg		0.05	20-DEC-19
Chlorobenzene			<0.050		mg/kg		0.05	20-DEC-19
Chloroethane			<0.050		mg/kg		0.05	20-DEC-19
Chloroform			<0.050		mg/kg		0.05	20-DEC-19
Chloromethane			<0.050		mg/kg		0.05	20-DEC-19
2-Chlorotoluene			<0.10		mg/kg		0.1	20-DEC-19
4-Chlorotoluene			<0.10		mg/kg		0.1	20-DEC-19
Dibromochloromethane			<0.050		mg/kg		0.05	20-DEC-19
1,2-Dibromo-3-chloropropane			<0.050		mg/kg		0.05	20-DEC-19
1,2-Dibromoethane			<0.050		mg/kg		0.05	20-DEC-19
Dibromomethane			<0.050		mg/kg		0.05	20-DEC-19
1,2-Dichlorobenzene			<0.050		mg/kg		0.05	20-DEC-19
1,3-Dichlorobenzene			<0.050		mg/kg		0.05	20-DEC-19
1,4-Dichlorobenzene			<0.050		mg/kg		0.05	20-DEC-19
Dichlorodifluoromethane			<0.050		mg/kg		0.05	20-DEC-19
1,1-dichloroethane			<0.050		mg/kg		0.05	20-DEC-19
1,2-Dichloroethane			<0.050		mg/kg		0.05	20-DEC-19
1,1-dichloroethene			<0.050		mg/kg		0.05	20-DEC-19
cis-1,2-Dichloroethene			<0.050		mg/kg		0.05	20-DEC-19
trans-1,2-Dichloroethene			<0.050		mg/kg		0.05	20-DEC-19
Dichloromethane			<0.10		mg/kg		0.1	20-DEC-19
1,2-Dichloropropane			<0.050		mg/kg		0.05	20-DEC-19
1,3-Dichloropropane			<0.050		mg/kg		0.05	20-DEC-19
2,2-Dichloropropane			<0.10		mg/kg		0.1	20-DEC-19
1,1-Dichloropropene			<0.050		mg/kg		0.05	20-DEC-19
cis-1,3-Dichloropropene			<0.050		mg/kg		0.05	20-DEC-19
trans-1,3-Dichloropropene			<0.050		mg/kg		0.05	20-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Soil**							
Batch R4953041								
WG3247019-1 MB								
Ethylbenzene			<0.015		mg/kg		0.015	20-DEC-19
F1			<10		mg/kg		10	20-DEC-19
Hexachlorobutadiene			<0.050		mg/kg		0.05	20-DEC-19
Hexane			<0.050		mg/kg		0.05	20-DEC-19
2-Hexanone (Methyl butyl ketone)			<0.50		mg/kg		0.5	20-DEC-19
Isopropylbenzene			<0.10		mg/kg		0.1	20-DEC-19
4-Isopropyltoluene			<0.10		mg/kg		0.1	20-DEC-19
MEK			<0.50		mg/kg		0.5	20-DEC-19
MIBK			<0.50		mg/kg		0.5	20-DEC-19
MTBE			<0.20		mg/kg		0.2	20-DEC-19
Styrene			<0.050		mg/kg		0.05	20-DEC-19
1,1,1,2-Tetrachloroethane			<0.050		mg/kg		0.05	20-DEC-19
1,1,2,2-Tetrachloroethane			<0.050		mg/kg		0.05	20-DEC-19
Tetrachloroethene			<0.050		mg/kg		0.05	20-DEC-19
Toluene			<0.050		mg/kg		0.05	20-DEC-19
1,2,3-Trichlorobenzene			<0.050		mg/kg		0.05	20-DEC-19
1,2,4-Trichlorobenzene			<0.050		mg/kg		0.05	20-DEC-19
1,1,1-Trichloroethane			<0.050		mg/kg		0.05	20-DEC-19
1,1,2-Trichloroethane			<0.050		mg/kg		0.05	20-DEC-19
Trichloroethene			<0.050		mg/kg		0.05	20-DEC-19
Trichlorofluoromethane			<0.050		mg/kg		0.05	20-DEC-19
1,2,3-Trichloropropane			<0.050		mg/kg		0.05	20-DEC-19
1,2,4-Trimethylbenzene			<0.050		mg/kg		0.05	20-DEC-19
1,3,5-Trimethylbenzene			<0.050		mg/kg		0.05	20-DEC-19
Vinyl Chloride			<0.050		mg/kg		0.05	20-DEC-19
M+P-Xylenes			<0.050		mg/kg		0.05	20-DEC-19
o-Xylene			<0.050		mg/kg		0.05	20-DEC-19
Surrogate: 1,4-Difluorobenzene (SS)			101.1		%		70-130	20-DEC-19
Surrogate: 3,4-Dichlorotoluene (SS)			126.6		%		70-130	20-DEC-19
Surrogate: 4-Bromofluorobenzene (SS)			88.4		%		70-130	20-DEC-19

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

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December 30, 2019

Mr. Craig Riddell
ALS Environmental-Winnipeg MB
Unit 12–1329 Niakwa Road East
Winnipeg, MB, R2J 3T4

Certificate of Analysis

Project Name:	**TOX**	Workorder:	**3077324**
Purchase Order:		Workorder ID:	**L2394273**

Dear Mr. Riddell:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, December 24, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Sarah S Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Bea Ryback

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Sarah S Leung
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3077324 L2394273

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3077324001	L2394273-1 TH19-03@0.8	Solid	12/3/2019 00:00	12/24/2019 08:35	Collected by Client
3077324002	L2394273-1 TH19-04@0.8	Solid	12/3/2019 00:00	12/24/2019 08:35	Collected by Client
3077324003	L2394273-1 TH19-07@0.8	Solid	12/3/2019 00:00	12/24/2019 08:35	Collected by Client
3077324004	L2394273-1 TH19-07@1.5	Solid	12/3/2019 00:00	12/24/2019 08:35	Collected by Client

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SAMPLE SUMMARY

Workorder: 3077324 L2394273

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3077324 L2394273

Lab ID: **3077324001** Date Collected: 12/3/2019 00:00 Matrix: Solid

Sample ID: **L2394273-1 TH19-03@0.8** Date Received: 12/24/2019 08:35

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	6.4	SW846 9023			12/30/19 12:23	PAG	A
Moisture	25.3		%	0.1	S2540G-11			12/26/19 09:30	AXD	
Total Solids	74.7	1	%	0.1	S2540G-11			12/26/19 09:30	AXD	

Ms. Sarah S Leung
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3077324 L2394273

Lab ID: **3077324002** Date Collected: 12/3/2019 00:00 Matrix: Solid

Sample ID: **L2394273-1 TH19-04@0.8** Date Received: 12/24/2019 08:35

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	5.0	SW846 9023			12/30/19 12:36	PAG	A
Moisture	9.3		%	0.1	S2540G-11			12/26/19 09:30	AXD	
Total Solids	90.7	1	%	0.1	S2540G-11			12/26/19 09:30	AXD	

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ANALYTICAL RESULTS

Workorder: 3077324 L2394273

Lab ID: **3077324003** Date Collected: 12/3/2019 00:00 Matrix: Solid

Sample ID: **L2394273-1 TH19-07@0.8** Date Received: 12/24/2019 08:35

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	4.9	SW846 9023			12/30/19 12:48	PAG	A
Moisture	4.7		%	0.1	S2540G-11			12/26/19 09:30	AXD	
Total Solids	95.3	1	%	0.1	S2540G-11			12/26/19 09:30	AXD	

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ANALYTICAL RESULTS

Workorder: 3077324 L2394273

Lab ID: **3077324004** Date Collected: 12/3/2019 00:00 Matrix: Solid

Sample ID: **L2394273-1 TH19-07@1.5** Date Received: 12/24/2019 08:35

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		mg/kg	6.2	SW846 9023			12/30/19 13:01	PAG	A
Moisture	25.8		%	0.1	S2540G-11			12/26/19 09:30	AXD	
Total Solids	74.2	1	%	0.1	S2540G-11			12/26/19 09:30	AXD	

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ANALYTICAL RESULTS

Workorder: 3077324 L2394273

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3077324001	1	L2394273-1 TH19-03@0.8	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				
3077324002	1	L2394273-1 TH19-04@0.8	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				
3077324003	1	L2394273-1 TH19-07@0.8	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				
3077324004	1	L2394273-1 TH19-07@1.5	S2540G-11	Total Solids
Analyte was analyzed past the 7 day holding time.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3077324 L2394273

Lab ID	Sample ID	Analysis Method	Prep Method
3077324001	L2394273-1 TH19-03@0.8	S2540G-11	
3077324001	L2394273-1 TH19-03@0.8	SW846 9023	
3077324002	L2394273-1 TH19-04@0.8	S2540G-11	
3077324002	L2394273-1 TH19-04@0.8	SW846 9023	
3077324003	L2394273-1 TH19-07@0.8	S2540G-11	
3077324003	L2394273-1 TH19-07@0.8	SW846 9023	
3077324004	L2394273-1 TH19-07@1.5	S2540G-11	
3077324004	L2394273-1 TH19-07@1.5	SW846 9023	

QUALITY CONTROL DATA

Workorder: 3077324 L2394273

QC Batch: WETC/232356 **Analysis Method:** S2540G-11

QC Batch Method: S2540G-11

Associated Lab Samples: 3077324001, 3077324002, 3077324003, 3077324004

SAMPLE DUPLICATE: 3065447 ORIGINAL: 3077051001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	94.0438	%	94.1546	.12	10
Total Solids	5.9561	%	5.8453	1.88	5

SAMPLE DUPLICATE: 3065610 ORIGINAL: 3077058001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	95.5028	%	95.5185	.02	10
Total Solids	4.4971	%	4.4814	.35	5

SAMPLE DUPLICATE: 3065448 ORIGINAL: 3077071001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	97.4313	%	97.3091	.13	10
Total Solids	2.5686	%	2.6908	4.65	5

SAMPLE DUPLICATE: 3065449 ORIGINAL: 3077169006

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	5.5294	%	6.7322	19.6*	10
Total Solids	94.4705	%	93.2677	1.28	5

SAMPLE DUPLICATE: 3065450 ORIGINAL: 3077324004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	25.8211	%	25.1385	2.68	10
Total Solids	74.1788	%	74.8614	.92	5

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QUALITY CONTROL DATA

Workorder: 3077324 L2394273

SAMPLE DUPLICATE: 3065451 ORIGINAL: 3077383009

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	22.3609	%	23.6478	5.59	10
Total Solids	77.639	%	76.3521	1.67	5

QUALITY CONTROL DATA

Workorder: 3077324 L2394273

QC Batch: WETC/232537 **Analysis Method:** SW846 9023

QC Batch Method: SW846 9023

Associated Lab Samples: 3077324001, 3077324002, 3077324003, 3077324004

METHOD BLANK: 3067078

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	mg/kg	5.0

LABORATORY CONTROL SAMPLE: 3067079

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	104	mg/kg	500	520	90 - 110

LABORATORY CONTROL SAMPLE: 3067080

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	101	mg/kg	500	504	90 - 110

MATRIX SPIKE: 3067267 DUPLICATE: 3067268 ORIGINAL: 3077324004

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Halogen, Total Organic (TOX)	0	mg/kg	461	415.71	427.74	90.2	92.8	80 - 120	2.85	20

METHOD BLANK: 3067082

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	mg/kg	5.0

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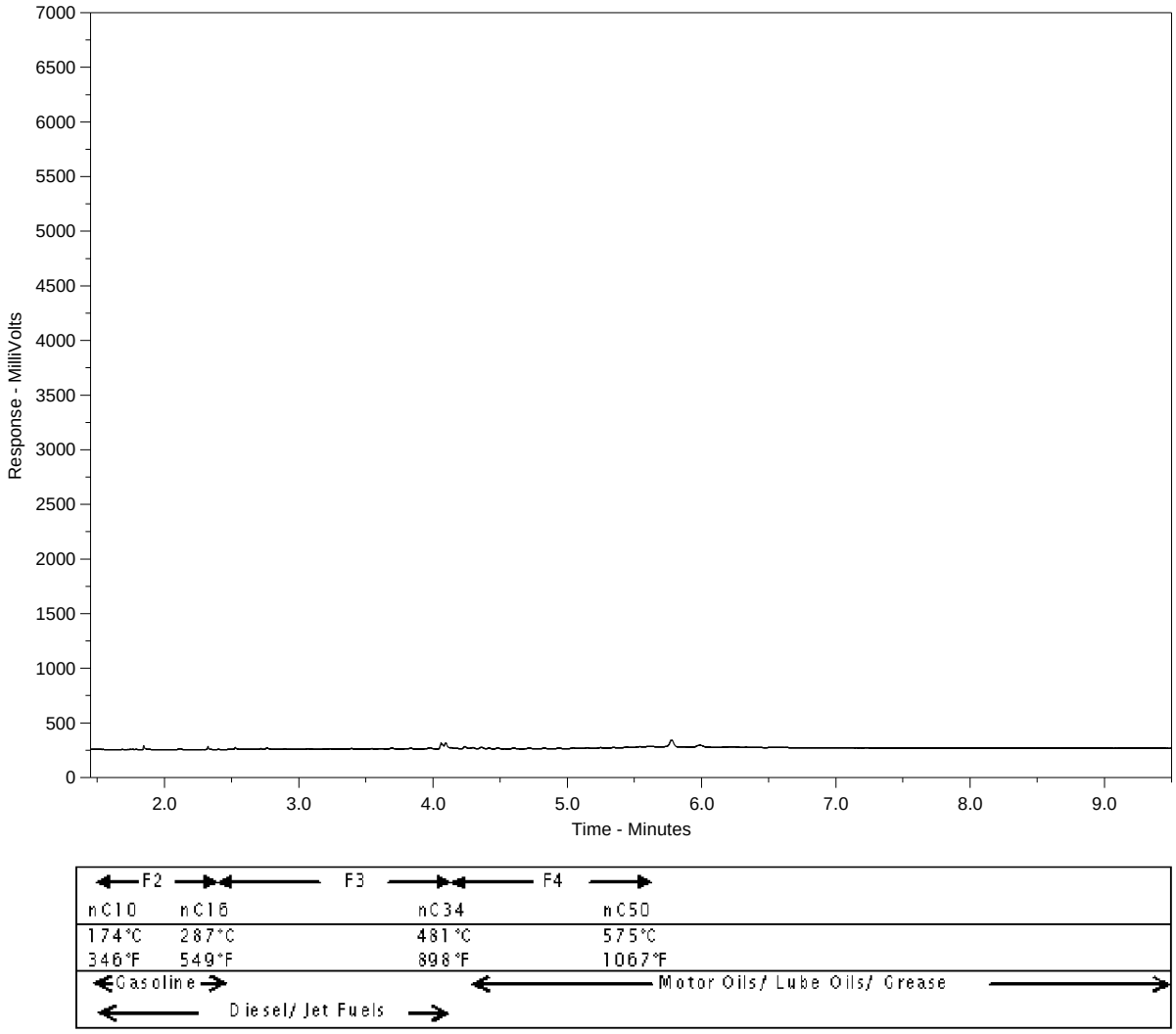
QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3077324 L2394273

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3077324001	L2394273-1 TH19-03@0.8			S2540G-11	WETC/232356
3077324002	L2394273-1 TH19-04@0.8			S2540G-11	WETC/232356
3077324003	L2394273-1 TH19-07@0.8			S2540G-11	WETC/232356
3077324004	L2394273-1 TH19-07@1.5			S2540G-11	WETC/232356
3077324001	L2394273-1 TH19-03@0.8			SW846 9023	WETC/232537
3077324002	L2394273-1 TH19-04@0.8			SW846 9023	WETC/232537
3077324003	L2394273-1 TH19-07@0.8			SW846 9023	WETC/232537
3077324004	L2394273-1 TH19-07@1.5			SW846 9023	WETC/232537

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2394273-1
Client Sample ID: TH19-03 @ 0.8M



The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

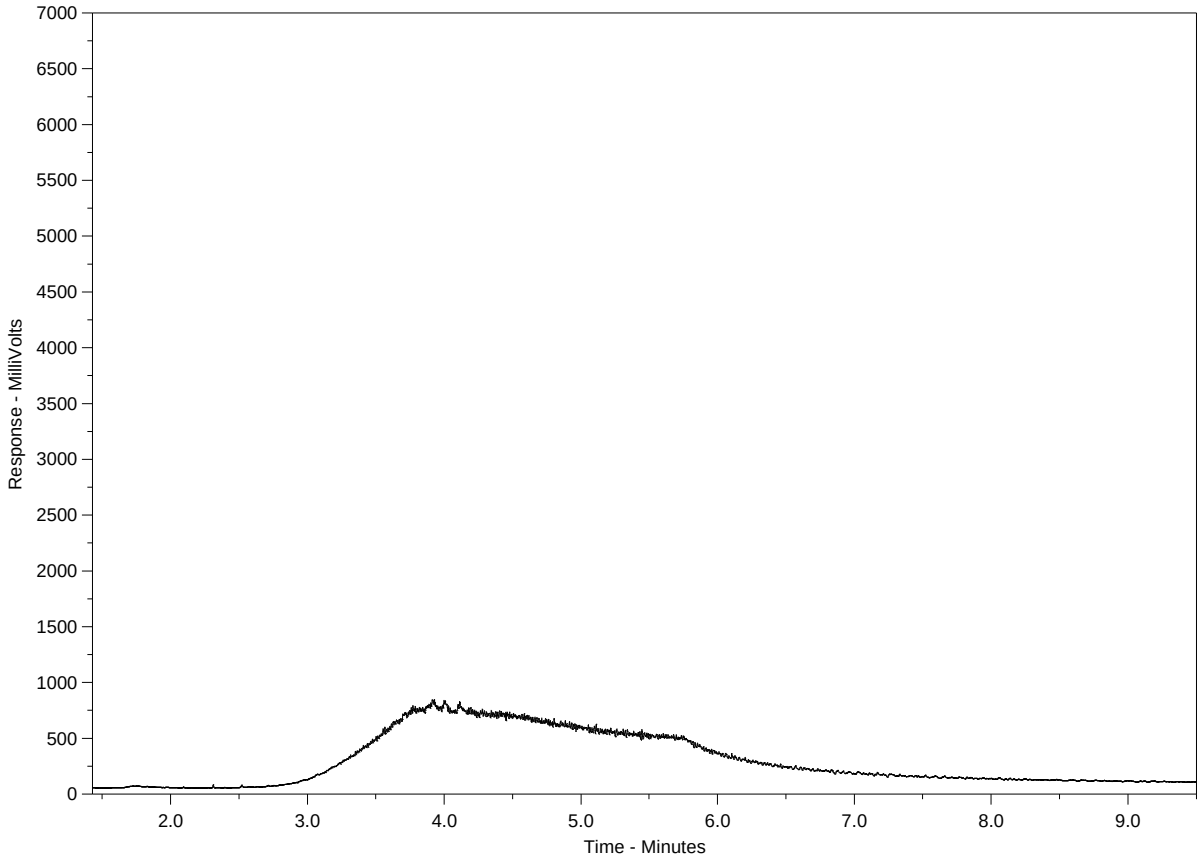
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

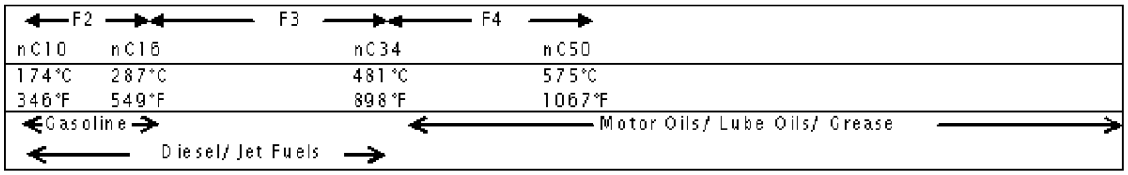
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2394273-2
Client Sample ID: TH19-04 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

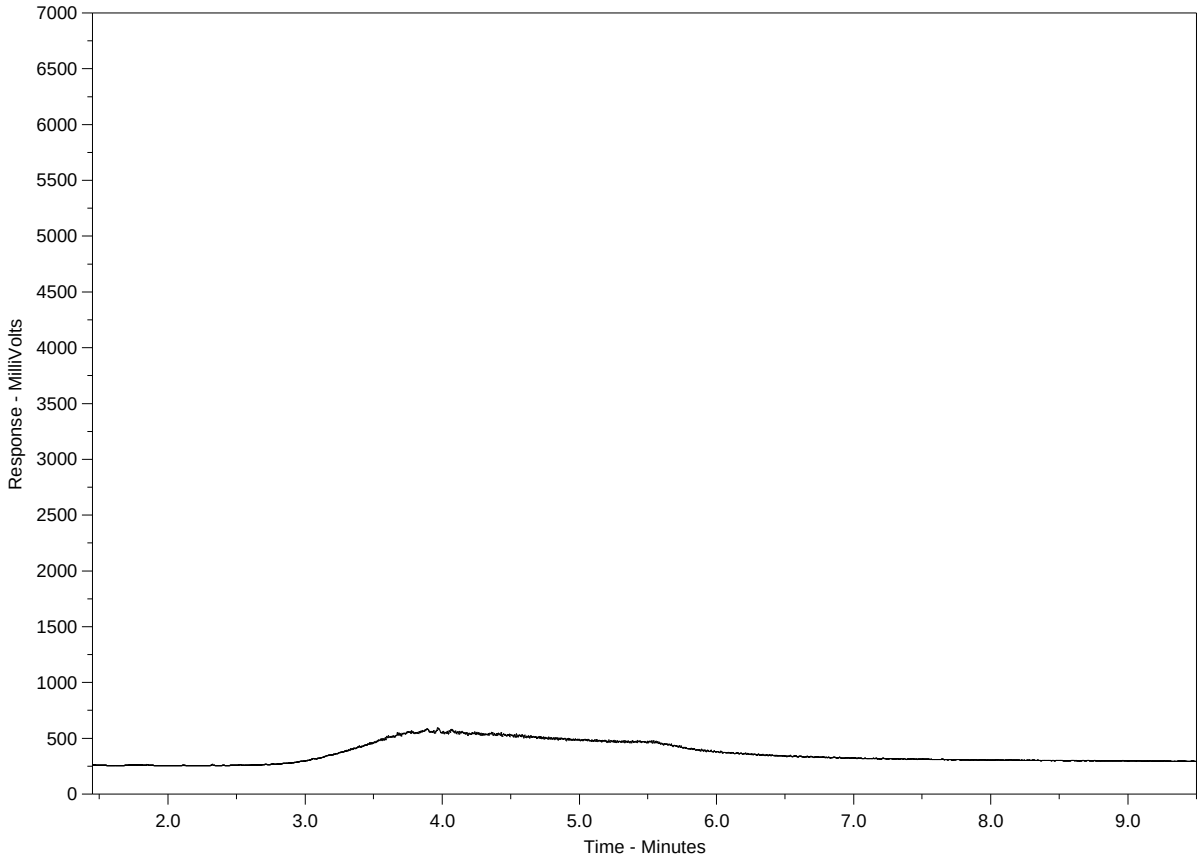
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

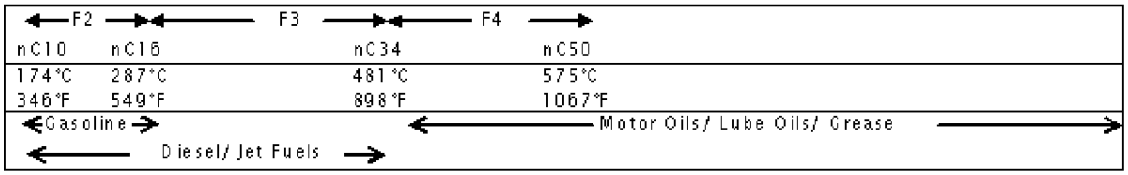
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2394273-3
Client Sample ID: TH19-07 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

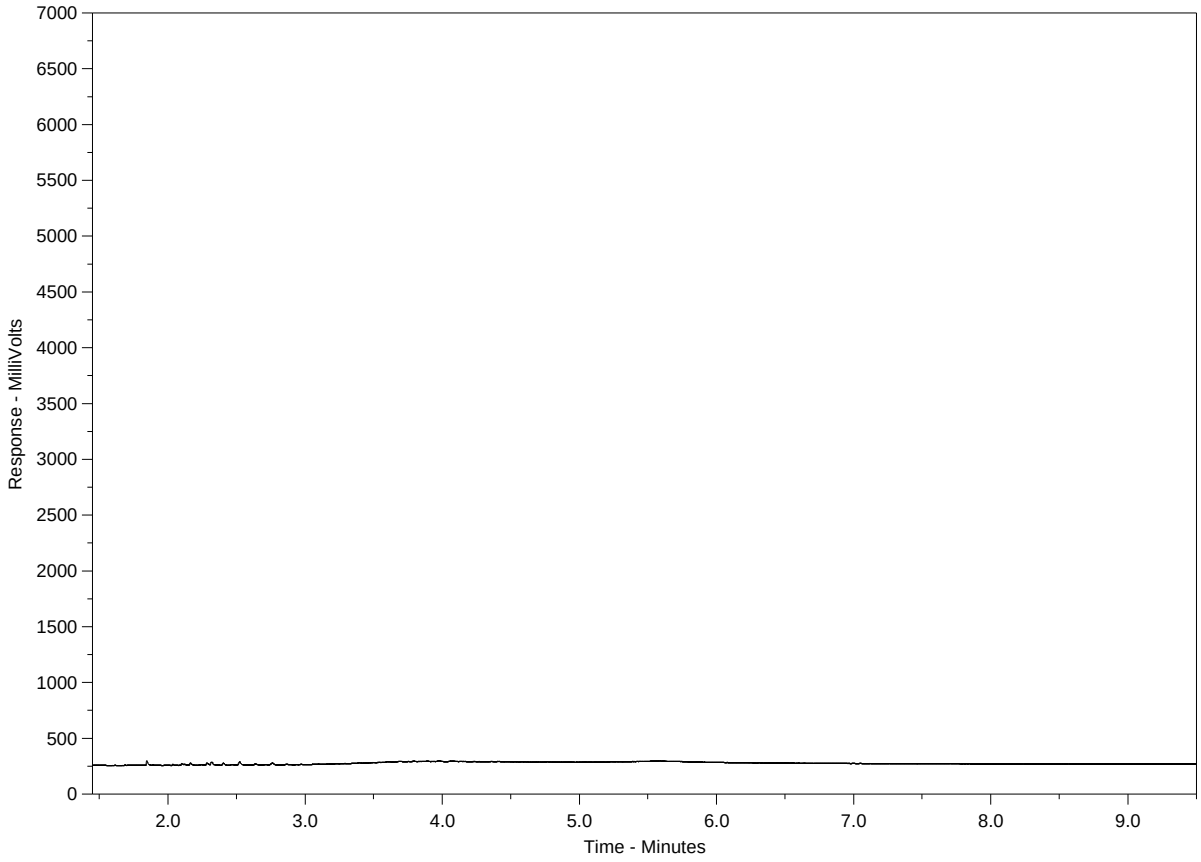
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

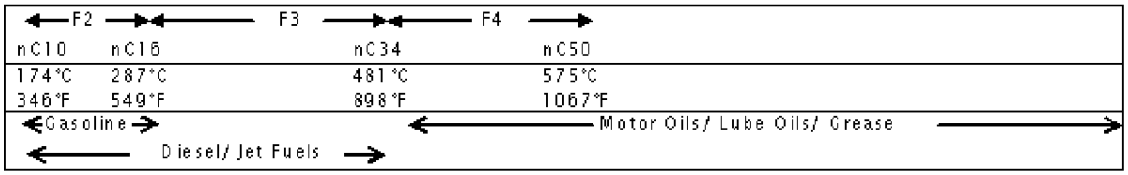
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2394273-4
Client Sample ID: TH19-07 @ 1.5M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

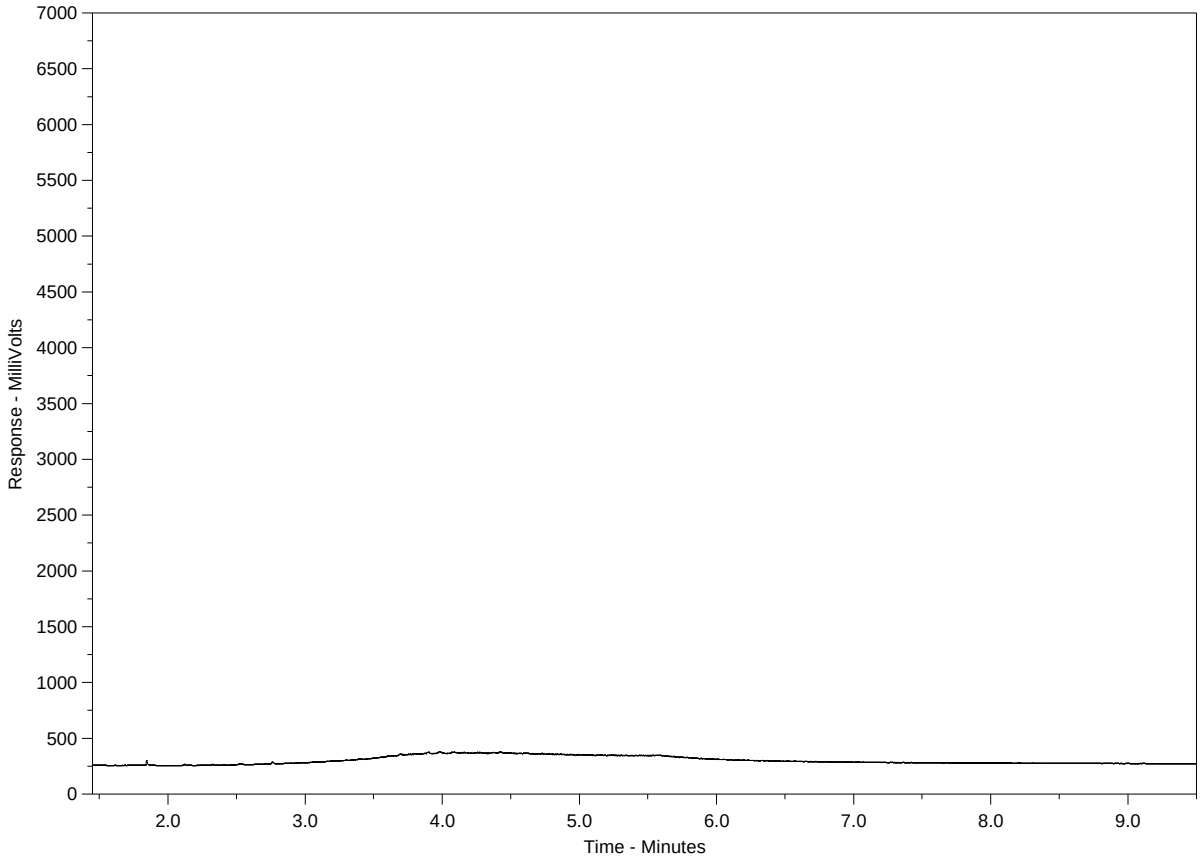
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

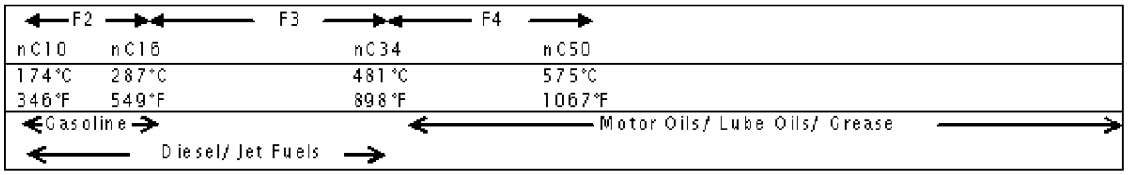
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2394273-5
Client Sample ID: TH19-08 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

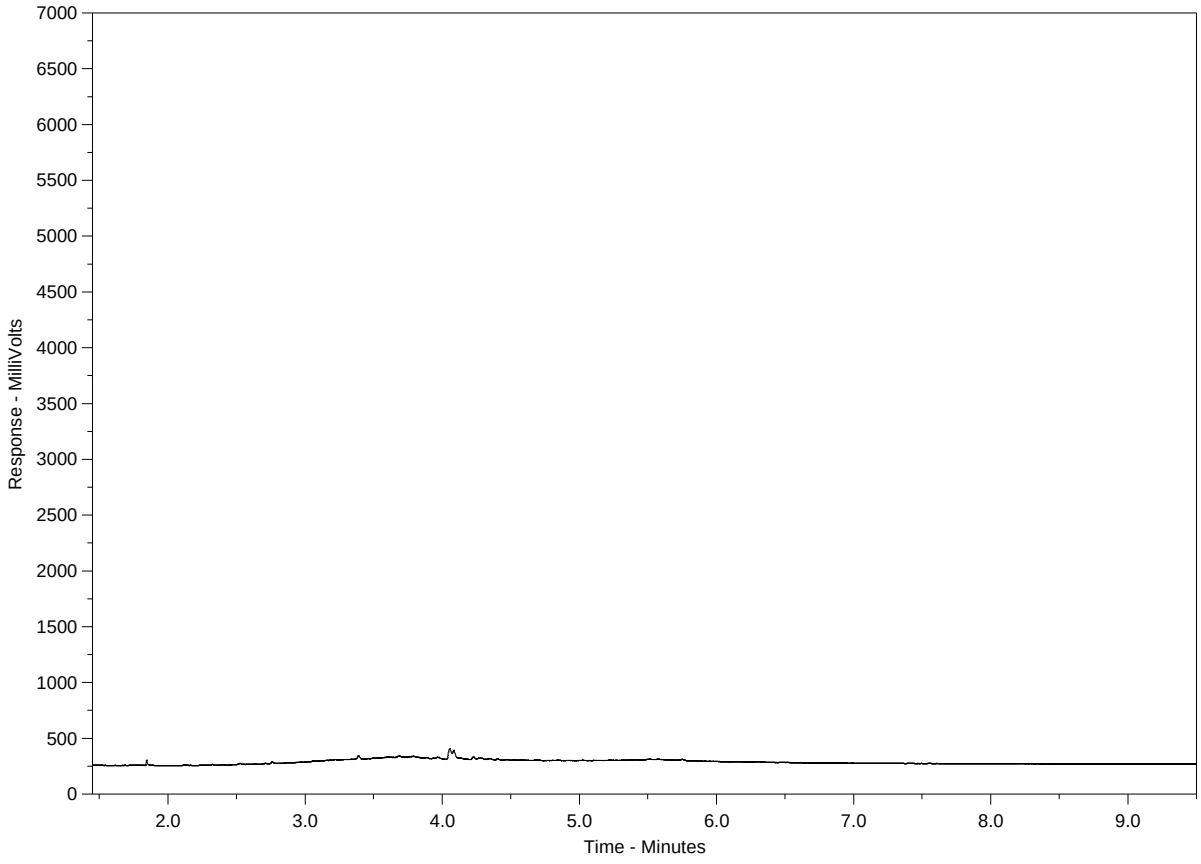
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

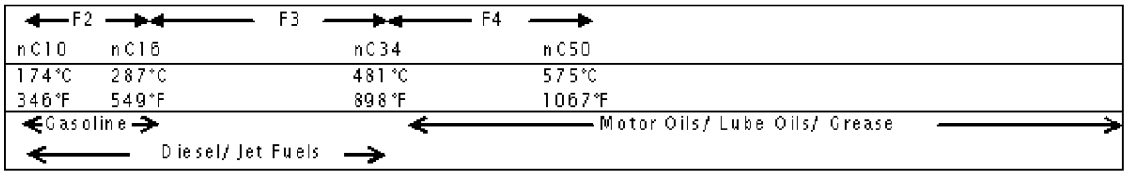
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2394273-6
Client Sample ID: TH19-10 @ 0.8M





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

L2394273-COFC

COC # ____________

Page 1 of 1

Report to:		**Report Format / Distribution**	
Company:	Wood	☑ Standard ☐ Other	
Contact:		☑ PDF ☑ Excel ☐ Fax	
Address:	440 Dovercourt Drive	Email 1:	kevin.beechinor@woodplc.com
		Email 2:	justin.huberdeau@woodplc.com
Phone:	(204)488-2997 Fax: (204)489-8261		
Invoice To:	☑ Same as Report	Indicate Bottles: Filtered / Preserved (F/P) →	
Company:		**Client / Project Information:**	
Contact:		Job #:	WX18979 999 Redonda
Address:		PO/AFE:	
Sample		Legal Site Description:	
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact:	Sampler (Initials):

Service Requested:
- ☑ Regular Service (Default)
- ☐ Rush Service (2-3 Days)
- ☐ Priority Service (1 Day or ASAP)
- ☐ Emergency Service (<1 Day / Wkend) - Contact ALS

Analysis Request

Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	BTEX F1 - F4	PAH	VOC	PCB	Metals	EOX					Hazardous?	Highly Contaminated?	Number of Containers
	TH19-03 @ 0.8 m	03-Dec-19		Soil	X	X	X	X	X	X							
	TH19-04 @ 0.8 m	03-Dec-19		Soil	X	X	X	X	X	X							
	~~[illegible]~~	~~03-Dec-19~~		~~Soil~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							
	TH19-07 @ 0.8 m	03-Dec-19		Soil	X	X	X	X	X	X							
	TH19-07 @ 1.5 m	03-Dec-19		Soil	X	X	X	X	X	X							
	TH19-08 @ 0.8 m	03-Dec-19		Soil	X	X			X								
	TH19-10 @ 0.8 m	03-Dec-19		Soil	X	X			X								

Guidelines / Regulations	Special Instructions / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.

								Sample Condition (lab use only)	
Relinquished By:	Justin Huberdeau	Date & Time: 09:30	9-Dec-19	Received By:	AL	Date & Time:	DEC 10 1245	Temperature	Samples Received in Good Condition? Y / N (if no provided details)
Relinquished By:		Date & Time:		Received By:		Date & Time:	DEC 10 2019 130	12.7	

Wood Environment & Infrastructure Solutions (Winnipeg)
ATTN: JUSTIN HUBERDEAU
440 Dovercourt Drive
Winnipeg MB R3Y 1G4

Date Received: 20-DEC-19
Report Date: 08-MAY-20 15:14 (MT)
Version: FINAL REV. 2

Client Phone: 204-488-2997

Certificate of Analysis

Lab Work Order #: L2399352

Project P.O. #: NOT SUBMITTED
Job Reference: WX18979
C of C Numbers:
Legal Site Desc:

Comments:
8-MAY-2020 AMENDED REPORT - Dioxin & Furan Results removed from Frac-1 to -6

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-1 TH19-04							
Sampled By: CLIENT on 20-DEC-19 @ 12:00							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					08-JAN-20	R4965448
Mercury (Hg)-Total	0.0000260		0.0000050	mg/L	03-JAN-20	03-JAN-20	R4958945
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	8.42	DLM	0.030	mg/L	08-JAN-20	08-JAN-20	R4965231
Antimony (Sb)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Arsenic (As)-Total	0.0086	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Barium (Ba)-Total	0.198	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Beryllium (Be)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Bismuth (Bi)-Total	<0.00050	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Boron (B)-Total	0.27	DLM	0.10	mg/L	08-JAN-20	08-JAN-20	R4965231
Cadmium (Cd)-Total	0.000337	DLM	0.000050	mg/L	08-JAN-20	08-JAN-20	R4965231
Calcium (Ca)-Total	361	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Cesium (Cs)-Total	0.00129	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Chromium (Cr)-Total	0.0163	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Cobalt (Co)-Total	0.0228	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Copper (Cu)-Total	0.0318	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Iron (Fe)-Total	12.6	DLM	0.10	mg/L	08-JAN-20	08-JAN-20	R4965231
Lead (Pb)-Total	0.0184	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Lithium (Li)-Total	0.360	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Magnesium (Mg)-Total	282	DLM	0.050	mg/L	08-JAN-20	08-JAN-20	R4965231
Manganese (Mn)-Total	4.10	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Molybdenum (Mo)-Total	0.00371	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Nickel (Ni)-Total	0.0409	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Potassium (K)-Total	7.21	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Phosphorus (P)-Total	0.33	DLM	0.30	mg/L	08-JAN-20	08-JAN-20	R4965231
Rubidium (Rb)-Total	0.0184	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Selenium (Se)-Total	<0.00050	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Silicon (Si)-Total	32.3	DLM	1.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Silver (Ag)-Total	0.00012	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Sodium (Na)-Total	188	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Strontium (Sr)-Total	1.83	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Sulfur (S)-Total	425	DLM	5.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Tellurium (Te)-Total	<0.0020	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Thallium (Tl)-Total	0.00016	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Thorium (Th)-Total	0.0031	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Tin (Sn)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Titanium (Ti)-Total	0.165	DLM	0.0030	mg/L	08-JAN-20	08-JAN-20	R4965231
Tungsten (W)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Uranium (U)-Total	0.0398	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Vanadium (V)-Total	0.0271	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Zinc (Zn)-Total	0.167	DLM	0.030	mg/L	08-JAN-20	08-JAN-20	R4965231
Zirconium (Zr)-Total	0.0026	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Acridine	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)pyrene	0.0000084		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-1 TH19-04							
Sampled By: CLIENT on 20-DEC-19 @ 12:00							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	0.000014	EMPC	0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Chrysene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluoranthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluorene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Naphthalene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Phenanthrene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Pyrene	0.000018		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Quinoline	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acenaphthene d10	85.1		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acridine d9	75.0		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Chrysene d12	95.3		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Naphthalene d8	77.9		50-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Phenanthrene d10	87.4		60-130	%	27-DEC-19	03-JAN-20	R4959944
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	21-DEC-19	28-DEC-19	R4957846
F3 (C16-C34)	1.26		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
F4 (C34-C50)	0.66		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
Surrogate: 2-Bromobenzotrifluoride	104.0		60-140	%	21-DEC-19	28-DEC-19	R4957846
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		07-JAN-20	
F3-PAH	1.26		0.25	mg/L		07-JAN-20	
Total Hydrocarbons (C6-C50)	1.92		0.38	mg/L		07-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		03-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		03-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		31-DEC-19	R4958822
Benzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromochloromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromodichloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromoform	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
n-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
sec-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
tert-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Carbon disulfide	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
Carbon Tetrachloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroform	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
2-Chlorotoluene	<0.020		0.020	mg/L		31-DEC-19	R4958822
4-Chlorotoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-1 TH19-04							
Sampled By: CLIENT on 20-DEC-19 @ 12:00							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dibromoethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dibromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1-dichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
1,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Ethylbenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
F1	<0.10		0.10	mg/L		31-DEC-19	R4958822
Hexachlorobutadiene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Hexane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		31-DEC-19	R4958822
Isopropylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
4-Isopropyltoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
MEK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MIBK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MTBE	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Styrene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Tetrachloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Toluene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichlorofluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Vinyl Chloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
M+P-Xylenes	<0.00040		0.00040	mg/L		31-DEC-19	R4958822
o-Xylene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Surrogate: 4-Bromofluorobenzene (SS)	88.1		70-130	%		31-DEC-19	R4958822
Surrogate: 1,4-Difluorobenzene (SS)	98.8		70-130	%		31-DEC-19	R4958822
Surrogate: 3,4-Dichlorotoluene (SS)	81.8		70-130	%		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-2 TH19-03							
Sampled By: CLIENT on 20-DEC-19 @ 12:30							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					08-JAN-20	R4965448
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JAN-20	03-JAN-20	R4958945
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	395	DLM	0.30	mg/L	08-JAN-20	08-JAN-20	R4965231
Antimony (Sb)-Total	<0.010	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Arsenic (As)-Total	0.289	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Barium (Ba)-Total	6.79	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Beryllium (Be)-Total	0.021	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Bismuth (Bi)-Total	0.0063	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Boron (B)-Total	1.1	DLM	1.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Cadmium (Cd)-Total	0.0136	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Calcium (Ca)-Total	9510	DLM	5.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Cesium (Cs)-Total	0.0525	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Chromium (Cr)-Total	0.822	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Cobalt (Co)-Total	0.360	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Copper (Cu)-Total	0.944	DLM	0.050	mg/L	08-JAN-20	08-JAN-20	R4965231
Iron (Fe)-Total	631	DLM	1.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Lead (Pb)-Total	0.409	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Lithium (Li)-Total	1.33	DLM	0.10	mg/L	08-JAN-20	08-JAN-20	R4965231
Magnesium (Mg)-Total	5210	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Manganese (Mn)-Total	28.9	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Molybdenum (Mo)-Total	0.0094	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Nickel (Ni)-Total	1.02	DLM	0.050	mg/L	08-JAN-20	08-JAN-20	R4965231
Potassium (K)-Total	96.2	DLM	5.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Phosphorus (P)-Total	30.6	DLM	3.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Rubidium (Rb)-Total	0.862	DLM	0.020	mg/L	08-JAN-20	08-JAN-20	R4965231
Selenium (Se)-Total	<0.0050	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Silicon (Si)-Total	633	DLM	10	mg/L	08-JAN-20	08-JAN-20	R4965231
Silver (Ag)-Total	0.0046	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Sodium (Na)-Total	602	DLM	5.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Strontium (Sr)-Total	11.8	DLM	0.020	mg/L	08-JAN-20	08-JAN-20	R4965231
Sulfur (S)-Total	851	DLM	50	mg/L	08-JAN-20	08-JAN-20	R4965231
Tellurium (Te)-Total	<0.020	DLM	0.020	mg/L	08-JAN-20	08-JAN-20	R4965231
Thallium (Tl)-Total	0.0087	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Thorium (Th)-Total	0.194	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Tin (Sn)-Total	<0.010	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Titanium (Ti)-Total	4.64	DLM	0.030	mg/L	08-JAN-20	08-JAN-20	R4965231
Tungsten (W)-Total	<0.010	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Uranium (U)-Total	0.168	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Vanadium (V)-Total	1.20	DLM	0.050	mg/L	08-JAN-20	08-JAN-20	R4965231
Zinc (Zn)-Total	1.70	DLM	0.30	mg/L	08-JAN-20	08-JAN-20	R4965231
Zirconium (Zr)-Total	0.053	DLM	0.020	mg/L	08-JAN-20	08-JAN-20	R4965231
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Acridine	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-2 TH19-03							
Sampled By: CLIENT on 20-DEC-19 @ 12:30							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Chrysene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluoranthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluorene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Naphthalene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Phenanthrene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Quinoline	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acenaphthene d10	85.6		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acridine d9	85.6		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Chrysene d12	116.7		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Naphthalene d8	84.6		50-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Phenanthrene d10	92.0		60-130	%	27-DEC-19	03-JAN-20	R4959944
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	21-DEC-19	28-DEC-19	R4957846
F3 (C16-C34)	<0.25		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
F4 (C34-C50)	<0.25		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
Surrogate: 2-Bromobenzotrifluoride	101.8		60-140	%	21-DEC-19	28-DEC-19	R4957846
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		07-JAN-20	
F3-PAH	<0.25		0.25	mg/L		07-JAN-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		07-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		03-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		03-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		31-DEC-19	R4958822
Benzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromochloromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromodichloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromoform	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
n-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
sec-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
tert-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Carbon disulfide	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
Carbon Tetrachloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroform	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
2-Chlorotoluene	<0.020		0.020	mg/L		31-DEC-19	R4958822
4-Chlorotoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-2 TH19-03							
Sampled By: CLIENT on 20-DEC-19 @ 12:30							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dibromoethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dibromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1-dichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
1,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Ethylbenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
F1	<0.10		0.10	mg/L		31-DEC-19	R4958822
Hexachlorobutadiene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Hexane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		31-DEC-19	R4958822
Isopropylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
4-Isopropyltoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
MEK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MIBK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MTBE	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Styrene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Tetrachloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Toluene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichlorofluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Vinyl Chloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
M+P-Xylenes	<0.00040		0.00040	mg/L		31-DEC-19	R4958822
o-Xylene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Surrogate: 4-Bromofluorobenzene (SS)	88.0		70-130	%		31-DEC-19	R4958822
Surrogate: 1,4-Difluorobenzene (SS)	98.9		70-130	%		31-DEC-19	R4958822
Surrogate: 3,4-Dichlorotoluene (SS)	91.5		70-130	%		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-3 TH19-10							
Sampled By: CLIENT on 20-DEC-19 @ 13:00							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					08-JAN-20	R4965448
Mercury (Hg)-Total	0.0000090		0.0000050	mg/L	03-JAN-20	03-JAN-20	R4958945
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.302	DLM	0.030	mg/L	08-JAN-20	08-JAN-20	R4965231
Antimony (Sb)-Total	0.0016	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Arsenic (As)-Total	0.0011	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Barium (Ba)-Total	0.0500	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Beryllium (Be)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Bismuth (Bi)-Total	<0.00050	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Boron (B)-Total	0.42	DLM	0.10	mg/L	08-JAN-20	08-JAN-20	R4965231
Cadmium (Cd)-Total	0.00140	DLM	0.000050	mg/L	08-JAN-20	08-JAN-20	R4965231
Calcium (Ca)-Total	415	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Cesium (Cs)-Total	<0.00010	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Chromium (Cr)-Total	0.0015	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Cobalt (Co)-Total	0.0024	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Copper (Cu)-Total	0.0312	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Iron (Fe)-Total	0.76	DLM	0.10	mg/L	08-JAN-20	08-JAN-20	R4965231
Lead (Pb)-Total	0.0207	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Lithium (Li)-Total	0.639	DLM	0.010	mg/L	08-JAN-20	08-JAN-20	R4965231
Magnesium (Mg)-Total	314	DLM	0.050	mg/L	08-JAN-20	08-JAN-20	R4965231
Manganese (Mn)-Total	1.17	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Molybdenum (Mo)-Total	0.00296	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Nickel (Ni)-Total	0.0302	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Potassium (K)-Total	7.85	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Phosphorus (P)-Total	<0.30	DLM	0.30	mg/L	08-JAN-20	08-JAN-20	R4965231
Rubidium (Rb)-Total	0.0026	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Selenium (Se)-Total	<0.00050	DLM	0.00050	mg/L	08-JAN-20	08-JAN-20	R4965231
Silicon (Si)-Total	12.9	DLM	1.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Silver (Ag)-Total	<0.00010	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Sodium (Na)-Total	259	DLM	0.50	mg/L	08-JAN-20	08-JAN-20	R4965231
Strontium (Sr)-Total	2.75	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Sulfur (S)-Total	699	DLM	5.0	mg/L	08-JAN-20	08-JAN-20	R4965231
Tellurium (Te)-Total	<0.0020	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Thallium (Tl)-Total	<0.00010	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Thorium (Th)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Tin (Sn)-Total	0.0031	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Titanium (Ti)-Total	0.0128	DLM	0.0030	mg/L	08-JAN-20	08-JAN-20	R4965231
Tungsten (W)-Total	<0.0010	DLM	0.0010	mg/L	08-JAN-20	08-JAN-20	R4965231
Uranium (U)-Total	0.0969	DLM	0.00010	mg/L	08-JAN-20	08-JAN-20	R4965231
Vanadium (V)-Total	<0.0050	DLM	0.0050	mg/L	08-JAN-20	08-JAN-20	R4965231
Zinc (Zn)-Total	0.522	DLM	0.030	mg/L	08-JAN-20	08-JAN-20	R4965231
Zirconium (Zr)-Total	<0.0020	DLM	0.0020	mg/L	08-JAN-20	08-JAN-20	R4965231
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Acridine	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-3 TH19-10							
Sampled By: CLIENT on 20-DEC-19 @ 13:00							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Chrysene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluoranthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluorene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Naphthalene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Phenanthrene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Quinoline	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acenaphthene d10	86.7		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acridine d9	89.3		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Chrysene d12	100.6		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Naphthalene d8	80.3		50-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Phenanthrene d10	90.2		60-130	%	27-DEC-19	03-JAN-20	R4959944
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	21-DEC-19	28-DEC-19	R4957846
F3 (C16-C34)	<0.25		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
F4 (C34-C50)	<0.25		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
Surrogate: 2-Bromobenzotrifluoride	101.8		60-140	%	21-DEC-19	28-DEC-19	R4957846
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		07-JAN-20	
F3-PAH	<0.25		0.25	mg/L		07-JAN-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		07-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		03-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		03-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		31-DEC-19	R4958822
Benzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromochloromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromodichloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromoform	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
n-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
sec-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
tert-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Carbon disulfide	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
Carbon Tetrachloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroform	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
2-Chlorotoluene	<0.020		0.020	mg/L		31-DEC-19	R4958822
4-Chlorotoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-3 TH19-10							
Sampled By: CLIENT on 20-DEC-19 @ 13:00							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dibromoethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dibromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1-dichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
1,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Ethylbenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
F1	<0.10		0.10	mg/L		31-DEC-19	R4958822
Hexachlorobutadiene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Hexane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		31-DEC-19	R4958822
Isopropylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
4-Isopropyltoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
MEK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MIBK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MTBE	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Styrene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Tetrachloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Toluene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichlorofluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Vinyl Chloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
M+P-Xylenes	<0.00040		0.00040	mg/L		31-DEC-19	R4958822
o-Xylene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Surrogate: 4-Bromofluorobenzene (SS)	71.5		70-130	%		31-DEC-19	R4958822
Surrogate: 1,4-Difluorobenzene (SS)	95.3		70-130	%		31-DEC-19	R4958822
Surrogate: 3,4-Dichlorotoluene (SS)	71.4		70-130	%		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-4 TH19-08							
Sampled By: CLIENT on 20-DEC-19 @ 13:30							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					08-JAN-20	R4965448
Mercury (Hg)-Total	0.0000590		0.0000050	mg/L	03-JAN-20	03-JAN-20	R4958945
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	10.9	DLM	0.030	mg/L	09-JAN-20	09-JAN-20	R4966116
Antimony (Sb)-Total	<0.0010	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Arsenic (As)-Total	0.0076	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Barium (Ba)-Total	0.187	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Beryllium (Be)-Total	<0.0010	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Bismuth (Bi)-Total	<0.00050	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Boron (B)-Total	0.34	DLM	0.10	mg/L	09-JAN-20	09-JAN-20	R4966116
Cadmium (Cd)-Total	0.000406	DLM	0.000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Calcium (Ca)-Total	469	DLM	0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Cesium (Cs)-Total	0.00181	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Chromium (Cr)-Total	0.0228	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Cobalt (Co)-Total	0.0172	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Copper (Cu)-Total	0.0414	DLM	0.0050	mg/L	09-JAN-20	09-JAN-20	R4966116
Iron (Fe)-Total	16.6	DLM	0.10	mg/L	09-JAN-20	09-JAN-20	R4966116
Lead (Pb)-Total	0.0286	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Lithium (Li)-Total	0.558	DLM	0.010	mg/L	09-JAN-20	09-JAN-20	R4966116
Magnesium (Mg)-Total	307	DLM	0.050	mg/L	09-JAN-20	09-JAN-20	R4966116
Manganese (Mn)-Total	2.38	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Molybdenum (Mo)-Total	0.00558	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Nickel (Ni)-Total	0.0401	DLM	0.0050	mg/L	09-JAN-20	09-JAN-20	R4966116
Potassium (K)-Total	7.63	DLM	0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Phosphorus (P)-Total	0.35	DLM	0.30	mg/L	09-JAN-20	09-JAN-20	R4966116
Rubidium (Rb)-Total	0.0236	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Selenium (Se)-Total	<0.00050	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Silicon (Si)-Total	35.2	DLM	1.0	mg/L	09-JAN-20	09-JAN-20	R4966116
Silver (Ag)-Total	0.00018	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Sodium (Na)-Total	229	DLM	0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Strontium (Sr)-Total	2.37	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Sulfur (S)-Total	578	DLM	5.0	mg/L	09-JAN-20	09-JAN-20	R4966116
Tellurium (Te)-Total	<0.0020	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Thallium (Tl)-Total	0.00020	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Thorium (Th)-Total	0.0042	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Tin (Sn)-Total	0.0016	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Titanium (Ti)-Total	0.220	DLM	0.0030	mg/L	09-JAN-20	09-JAN-20	R4966116
Tungsten (W)-Total	<0.0010	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Uranium (U)-Total	0.0618	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Vanadium (V)-Total	0.0365	DLM	0.0050	mg/L	09-JAN-20	09-JAN-20	R4966116
Zinc (Zn)-Total	0.162	DLM	0.030	mg/L	09-JAN-20	09-JAN-20	R4966116
Zirconium (Zr)-Total	0.0037	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
2-Methyl Naphthalene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthylene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Anthracene	<0.000030	DLM	0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Acridine	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)anthracene	<0.000030	DLM	0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)pyrene	<0.000015	DLM	0.000015	mg/L	27-DEC-19	03-JAN-20	R4959944

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-4 TH19-08							
Sampled By: CLIENT on 20-DEC-19 @ 13:30							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000030	DLM	0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(g,h,i)perylene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(k)fluoranthene	<0.000030	DLM	0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Chrysene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Dibenzo(a,h)anthracene	<0.000015	DLM	0.000015	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluoranthene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluorene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Indeno(1,2,3-cd)pyrene	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
Naphthalene	<0.00015	DLM	0.00015	mg/L	27-DEC-19	03-JAN-20	R4959944
Phenanthrene	<0.00015	DLM	0.00015	mg/L	27-DEC-19	03-JAN-20	R4959944
Pyrene	<0.000030	DLM	0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Quinoline	<0.000060	DLM	0.000060	mg/L	27-DEC-19	03-JAN-20	R4959944
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acenaphthene d10	108.6		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acridine d9	111.9		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Chrysene d12	109.9		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Naphthalene d8	109.6		50-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Phenanthrene d10	120.9		60-130	%	27-DEC-19	03-JAN-20	R4959944
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.50	DLM	0.50	mg/L	21-DEC-19	28-DEC-19	R4957846
F3 (C16-C34)	57.2	DLM	1.3	mg/L	21-DEC-19	28-DEC-19	R4957846
F4 (C34-C50)	74.0	DLM	1.3	mg/L	21-DEC-19	28-DEC-19	R4957846
Surrogate: 2-Bromobenzotrifluoride	100.1		60-140	%	21-DEC-19	28-DEC-19	R4957846
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-JAN-20	
F2-Naphth	<0.50		0.50	mg/L		07-JAN-20	
F3-PAH	57.2		1.3	mg/L		07-JAN-20	
Total Hydrocarbons (C6-C50)	131		1.8	mg/L		07-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		03-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		03-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		31-DEC-19	R4958822
Benzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromochloromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromodichloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromoform	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
n-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
sec-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
tert-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Carbon disulfide	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
Carbon Tetrachloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroform	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
2-Chlorotoluene	<0.020		0.020	mg/L		31-DEC-19	R4958822
4-Chlorotoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-4 TH19-08							
Sampled By: CLIENT on 20-DEC-19 @ 13:30							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dibromoethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dibromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1-dichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
1,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
cis-1,3-Dichloropropene	<0.0020	DLCI	0.0020	mg/L		31-DEC-19	R4958822
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Ethylbenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
F1	<0.10		0.10	mg/L		31-DEC-19	R4958822
Hexachlorobutadiene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Hexane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		31-DEC-19	R4958822
Isopropylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
4-Isopropyltoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
MEK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MIBK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MTBE	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Styrene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Tetrachloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Toluene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichlorofluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Vinyl Chloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
M+P-Xylenes	<0.00040		0.00040	mg/L		31-DEC-19	R4958822
o-Xylene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Surrogate: 4-Bromofluorobenzene (SS)	87.8		70-130	%		31-DEC-19	R4958822
Surrogate: 1,4-Difluorobenzene (SS)	97.3		70-130	%		31-DEC-19	R4958822
Surrogate: 3,4-Dichlorotoluene (SS)	86.7		70-130	%		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-5 TH19-07							
Sampled By: CLIENT on 20-DEC-19 @ 14:00							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					08-JAN-20	R4965448
Mercury (Hg)-Total	0.0000290		0.0000050	mg/L	03-JAN-20	03-JAN-20	R4958945
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	28.2	DLM	0.030	mg/L	09-JAN-20	09-JAN-20	R4966116
Antimony (Sb)-Total	<0.0010	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Arsenic (As)-Total	0.0246	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Barium (Ba)-Total	0.398	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Beryllium (Be)-Total	0.0017	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Bismuth (Bi)-Total	0.00052	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Boron (B)-Total	0.23	DLM	0.10	mg/L	09-JAN-20	09-JAN-20	R4966116
Cadmium (Cd)-Total	0.00117	DLM	0.000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Calcium (Ca)-Total	859	DLM	0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Cesium (Cs)-Total	0.00401	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Chromium (Cr)-Total	0.0598	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Cobalt (Co)-Total	0.0227	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Copper (Cu)-Total	0.0846	DLM	0.0050	mg/L	09-JAN-20	09-JAN-20	R4966116
Iron (Fe)-Total	58.6	DLM	0.10	mg/L	09-JAN-20	09-JAN-20	R4966116
Lead (Pb)-Total	0.0406	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Lithium (Li)-Total	0.638	DLM	0.010	mg/L	09-JAN-20	09-JAN-20	R4966116
Magnesium (Mg)-Total	551	DLM	0.050	mg/L	09-JAN-20	09-JAN-20	R4966116
Manganese (Mn)-Total	2.31	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Molybdenum (Mo)-Total	0.00379	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Nickel (Ni)-Total	0.0811	DLM	0.0050	mg/L	09-JAN-20	09-JAN-20	R4966116
Potassium (K)-Total	10.8	DLM	0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Phosphorus (P)-Total	1.86	DLM	0.30	mg/L	09-JAN-20	09-JAN-20	R4966116
Rubidium (Rb)-Total	0.0495	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Selenium (Se)-Total	0.00078	DLM	0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Silicon (Si)-Total	67.4	DLM	1.0	mg/L	09-JAN-20	09-JAN-20	R4966116
Silver (Ag)-Total	0.00035	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Sodium (Na)-Total	260	DLM	0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Strontium (Sr)-Total	2.61	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Sulfur (S)-Total	520	DLM	5.0	mg/L	09-JAN-20	09-JAN-20	R4966116
Tellurium (Te)-Total	<0.0020	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Thallium (Tl)-Total	0.00062	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Thorium (Th)-Total	0.0150	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Tin (Sn)-Total	0.0017	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Titanium (Ti)-Total	0.321	DLM	0.0030	mg/L	09-JAN-20	09-JAN-20	R4966116
Tungsten (W)-Total	<0.0010	DLM	0.0010	mg/L	09-JAN-20	09-JAN-20	R4966116
Uranium (U)-Total	0.0977	DLM	0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Vanadium (V)-Total	0.0946	DLM	0.0050	mg/L	09-JAN-20	09-JAN-20	R4966116
Zinc (Zn)-Total	0.247	DLM	0.030	mg/L	09-JAN-20	09-JAN-20	R4966116
Zirconium (Zr)-Total	0.0051	DLM	0.0020	mg/L	09-JAN-20	09-JAN-20	R4966116
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Acridine	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)pyrene	0.0000066		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-5 TH19-07							
Sampled By: CLIENT on 20-DEC-19 @ 14:00							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Chrysene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluoranthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluorene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Naphthalene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Phenanthrene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Pyrene	0.000022		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Quinoline	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acenaphthene d10	85.8		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acridine d9	91.5		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Chrysene d12	112.4		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Naphthalene d8	85.6		50-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Phenanthrene d10	100.8		60-130	%	27-DEC-19	03-JAN-20	R4959944
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	21-DEC-19	28-DEC-19	R4957846
F3 (C16-C34)	0.98		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
F4 (C34-C50)	0.83		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
Surrogate: 2-Bromobenzotrifluoride	102.1		60-140	%	21-DEC-19	28-DEC-19	R4957846
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		07-JAN-20	
F3-PAH	0.98		0.25	mg/L		07-JAN-20	
Total Hydrocarbons (C6-C50)	1.81		0.38	mg/L		07-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		03-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		03-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		31-DEC-19	R4958822
Benzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromochloromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromodichloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromoform	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
n-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
sec-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
tert-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Carbon disulfide	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
Carbon Tetrachloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroform	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
2-Chlorotoluene	<0.020		0.020	mg/L		31-DEC-19	R4958822
4-Chlorotoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-5 TH19-07							
Sampled By: CLIENT on 20-DEC-19 @ 14:00							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dibromoethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dibromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1-dichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
1,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Ethylbenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
F1	<0.10		0.10	mg/L		31-DEC-19	R4958822
Hexachlorobutadiene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Hexane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		31-DEC-19	R4958822
Isopropylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
4-Isopropyltoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
MEK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MIBK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MTBE	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Styrene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Tetrachloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Toluene	0.00115		0.00050	mg/L		31-DEC-19	R4958822
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichlorofluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Vinyl Chloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
M+P-Xylenes	<0.00040		0.00040	mg/L		31-DEC-19	R4958822
o-Xylene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Surrogate: 4-Bromofluorobenzene (SS)	89.2		70-130	%		31-DEC-19	R4958822
Surrogate: 1,4-Difluorobenzene (SS)	98.2		70-130	%		31-DEC-19	R4958822
Surrogate: 3,4-Dichlorotoluene (SS)	87.1		70-130	%		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-6 DUP1							
Sampled By: CLIENT on 20-DEC-19 @ 12:45							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					08-JAN-20	R4965448
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JAN-20	03-JAN-20	R4958945
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.340		0.0030	mg/L	09-JAN-20	09-JAN-20	R4966116
Antimony (Sb)-Total	0.00051		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Arsenic (As)-Total	0.00109		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Barium (Ba)-Total	0.0436		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Boron (B)-Total	0.177		0.010	mg/L	09-JAN-20	09-JAN-20	R4966116
Cadmium (Cd)-Total	0.000133		0.0000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Calcium (Ca)-Total	342		0.50	mg/L	09-JAN-20	09-JAN-20	R4966116
Cesium (Cs)-Total	0.000053		0.000010	mg/L	09-JAN-20	09-JAN-20	R4966116
Chromium (Cr)-Total	0.00203		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Cobalt (Co)-Total	0.00053		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Copper (Cu)-Total	0.00786		0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Iron (Fe)-Total	0.559		0.010	mg/L	09-JAN-20	09-JAN-20	R4966116
Lead (Pb)-Total	0.00110		0.000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Lithium (Li)-Total	0.443		0.010	mg/L	09-JAN-20	09-JAN-20	R4966116
Magnesium (Mg)-Total	363		0.050	mg/L	09-JAN-20	09-JAN-20	R4966116
Manganese (Mn)-Total	0.100		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Molybdenum (Mo)-Total	0.00538		0.000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Nickel (Ni)-Total	0.0116		0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Potassium (K)-Total	7.24		0.050	mg/L	09-JAN-20	09-JAN-20	R4966116
Phosphorus (P)-Total	0.098		0.030	mg/L	09-JAN-20	09-JAN-20	R4966116
Rubidium (Rb)-Total	0.00190		0.00020	mg/L	09-JAN-20	09-JAN-20	R4966116
Selenium (Se)-Total	0.00918		0.000050	mg/L	09-JAN-20	09-JAN-20	R4966116
Silicon (Si)-Total	11.4		0.10	mg/L	09-JAN-20	09-JAN-20	R4966116
Silver (Ag)-Total	0.000023		0.000010	mg/L	09-JAN-20	09-JAN-20	R4966116
Sodium (Na)-Total	169		0.050	mg/L	09-JAN-20	09-JAN-20	R4966116
Strontium (Sr)-Total	2.19		0.00020	mg/L	09-JAN-20	09-JAN-20	R4966116
Sulfur (S)-Total	557		5.0	mg/L	09-JAN-20	09-JAN-20	R4966116
Tellurium (Te)-Total	0.00021		0.00020	mg/L	09-JAN-20	09-JAN-20	R4966116
Thallium (Tl)-Total	0.000028		0.000010	mg/L	09-JAN-20	09-JAN-20	R4966116
Thorium (Th)-Total	0.00018		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Tin (Sn)-Total	0.00166		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Titanium (Ti)-Total	0.0149		0.00030	mg/L	09-JAN-20	09-JAN-20	R4966116
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-JAN-20	09-JAN-20	R4966116
Uranium (U)-Total	0.145		0.000010	mg/L	09-JAN-20	09-JAN-20	R4966116
Vanadium (V)-Total	0.00191		0.00050	mg/L	09-JAN-20	09-JAN-20	R4966116
Zinc (Zn)-Total	0.0187		0.0030	mg/L	09-JAN-20	09-JAN-20	R4966116
Zirconium (Zr)-Total	0.00143		0.00020	mg/L	09-JAN-20	09-JAN-20	R4966116
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Acenaphthylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Acridine	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-6 DUP1							
Sampled By: CLIENT on 20-DEC-19 @ 12:45							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Chrysene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluoranthene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Fluorene	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Naphthalene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Phenanthrene	<0.000050		0.000050	mg/L	27-DEC-19	03-JAN-20	R4959944
Pyrene	<0.000010		0.000010	mg/L	27-DEC-19	03-JAN-20	R4959944
Quinoline	<0.000020		0.000020	mg/L	27-DEC-19	03-JAN-20	R4959944
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acenaphthene d10	90.5		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Acridine d9	93.5		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Chrysene d12	108.8		60-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Naphthalene d8	93.4		50-130	%	27-DEC-19	03-JAN-20	R4959944
Surrogate: Phenanthrene d10	100.3		60-130	%	27-DEC-19	03-JAN-20	R4959944
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	21-DEC-19	28-DEC-19	R4957846
F3 (C16-C34)	<0.25		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
F4 (C34-C50)	<0.25		0.25	mg/L	21-DEC-19	28-DEC-19	R4957846
Surrogate: 2-Bromobenzotrifluoride	102.9		60-140	%	21-DEC-19	28-DEC-19	R4957846
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		07-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		07-JAN-20	
F3-PAH	<0.25		0.25	mg/L		07-JAN-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		07-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		03-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		03-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		31-DEC-19	R4958822
Benzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromochloromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromodichloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Bromoform	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Bromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
n-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
sec-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
tert-Butylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Carbon disulfide	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
Carbon Tetrachloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Chloroform	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Chloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
2-Chlorotoluene	<0.020		0.020	mg/L		31-DEC-19	R4958822
4-Chlorotoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2399352-6 DUP1							
Sampled By: CLIENT on 20-DEC-19 @ 12:45							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dibromoethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dibromomethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,2-Dichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1-dichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Dichloromethane	<0.0050		0.0050	mg/L		31-DEC-19	R4958822
1,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2,2-Dichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Ethylbenzene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
F1	<0.10		0.10	mg/L		31-DEC-19	R4958822
Hexachlorobutadiene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Hexane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		31-DEC-19	R4958822
Isopropylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
4-Isopropyltoluene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
MEK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MIBK	<0.020		0.020	mg/L		31-DEC-19	R4958822
MTBE	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Styrene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Tetrachloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Toluene	0.00070		0.00050	mg/L		31-DEC-19	R4958822
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichloroethene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Trichlorofluoromethane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		31-DEC-19	R4958822
Vinyl Chloride	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
M+P-Xylenes	<0.00040		0.00040	mg/L		31-DEC-19	R4958822
o-Xylene	<0.00050		0.00050	mg/L		31-DEC-19	R4958822
Surrogate: 4-Bromofluorobenzene (SS)	87.0		70-130	%		31-DEC-19	R4958822
Surrogate: 1,4-Difluorobenzene (SS)	90.7		70-130	%		31-DEC-19	R4958822
Surrogate: 3,4-Dichlorotoluene (SS)	90.7		70-130	%		31-DEC-19	R4958822

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic Interference due to co-elution.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DX-1613B-HRMS-BU	Water	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are filtered if required. Solids are extracted by Soxhlet using toluene. The liquid portion is extracted by liquid/liquid extraction using dichloromethane. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

EOX-MP	Misc.	Extractable Organic Halides (EOX)	SEE SUBLET LAB REPORT

The material is extracted with ethyl acetate then the extract is analyzed on the TOX (Total Organic Halides) instrument.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

HG-T-CVAA-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA 3511/8270D (mod)

PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

THM-SUM-CALC-WP	Water	Total Trihalomethanes (THMs)	CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A

In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.

XYLENES-SUM-CALC-	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

WP

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
MP	ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: Wood Environment & Infrastructure Solutions (Winnipeg)
440 Dovercourt Drive
Winnipeg MB R3Y 1G4
Contact: JUSTIN HUBERDEAU

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-FID-WP	**Water**							
Batch R4957846								
WG3247997-2 LCS								
F2 (C10-C16)			103.5		%		70-130	28-DEC-19
F3 (C16-C34)			95.7		%		70-130	28-DEC-19
F4 (C34-C50)			95.5		%		70-130	28-DEC-19
WG3247997-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	28-DEC-19
F3 (C16-C34)			<0.25		mg/L		0.25	28-DEC-19
F4 (C34-C50)			<0.25		mg/L		0.25	28-DEC-19
Surrogate: 2-Bromobenzotrifluoride			104.1		%		60-140	28-DEC-19
HG-T-CVAA-WP	**Water**							
Batch R4958945								
WG3252603-6 LCS								
Mercury (Hg)-Total			100.0		%		80-120	03-JAN-20
WG3252603-5 MB								
Mercury (Hg)-Total			<0.000005		mg/L		0.000005	03-JAN-20
MET-T-CCMS-WP	**Water**							
Batch R4965231								
WG3253967-2 LCS								
Aluminum (Al)-Total			104.5		%		80-120	08-JAN-20
Antimony (Sb)-Total			99.5		%		80-120	08-JAN-20
Arsenic (As)-Total			97.7		%		80-120	08-JAN-20
Barium (Ba)-Total			97.6		%		80-120	08-JAN-20
Beryllium (Be)-Total			97.5		%		80-120	08-JAN-20
Bismuth (Bi)-Total			96.8		%		80-120	08-JAN-20
Boron (B)-Total			88.6		%		80-120	08-JAN-20
Cadmium (Cd)-Total			97.9		%		80-120	08-JAN-20
Calcium (Ca)-Total			97.7		%		80-120	08-JAN-20
Cesium (Cs)-Total			99.6		%		80-120	08-JAN-20
Chromium (Cr)-Total			97.9		%		80-120	08-JAN-20
Cobalt (Co)-Total			97.8		%		80-120	08-JAN-20
Copper (Cu)-Total			95.2		%		80-120	08-JAN-20
Iron (Fe)-Total			88.2		%		80-120	08-JAN-20
Lead (Pb)-Total			98.5		%		80-120	08-JAN-20
Lithium (Li)-Total			95.5		%		80-120	08-JAN-20
Magnesium (Mg)-Total			114.4		%		80-120	08-JAN-20
Manganese (Mn)-Total			101.4		%		80-120	08-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4965231								
WG3253967-2 LCS								
Molybdenum (Mo)-Total			97.9		%		80-120	08-JAN-20
Nickel (Ni)-Total			94.3		%		80-120	08-JAN-20
Potassium (K)-Total			92.0		%		80-120	08-JAN-20
Phosphorus (P)-Total			106.9		%		80-120	08-JAN-20
Rubidium (Rb)-Total			99.3		%		80-120	08-JAN-20
Selenium (Se)-Total			95.8		%		80-120	08-JAN-20
Silicon (Si)-Total			103.6		%		80-120	08-JAN-20
Silver (Ag)-Total			95.0		%		80-120	08-JAN-20
Sodium (Na)-Total			101.5		%		80-120	08-JAN-20
Strontium (Sr)-Total			98.2		%		80-120	08-JAN-20
Sulfur (S)-Total			96.4		%		80-120	08-JAN-20
Tellurium (Te)-Total			94.8		%		80-120	08-JAN-20
Thallium (Tl)-Total			96.5		%		80-120	08-JAN-20
Thorium (Th)-Total			97.3		%		80-120	08-JAN-20
Tin (Sn)-Total			96.2		%		80-120	08-JAN-20
Titanium (Ti)-Total			94.9		%		80-120	08-JAN-20
Tungsten (W)-Total			98.2		%		80-120	08-JAN-20
Uranium (U)-Total			98.4		%		80-120	08-JAN-20
Vanadium (V)-Total			98.2		%		80-120	08-JAN-20
Zinc (Zn)-Total			93.7		%		80-120	08-JAN-20
Zirconium (Zr)-Total			89.7		%		80-120	08-JAN-20
WG3253967-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	08-JAN-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	08-JAN-20
Boron (B)-Total			<0.010		mg/L		0.01	08-JAN-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	08-JAN-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	08-JAN-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	08-JAN-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	08-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4965231								
WG3253967-1 MB								
Copper (Cu)-Total			<0.00050		mg/L		0.0005	08-JAN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	08-JAN-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	08-JAN-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	08-JAN-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	08-JAN-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	08-JAN-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	08-JAN-20
Potassium (K)-Total			<0.050		mg/L		0.05	08-JAN-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	08-JAN-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	08-JAN-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	08-JAN-20
Silicon (Si)-Total			<0.10		mg/L		0.1	08-JAN-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	08-JAN-20
Sodium (Na)-Total			<0.050		mg/L		0.05	08-JAN-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	08-JAN-20
Sulfur (S)-Total			<0.50		mg/L		0.5	08-JAN-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	08-JAN-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	08-JAN-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	08-JAN-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	08-JAN-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	08-JAN-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	08-JAN-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	08-JAN-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	08-JAN-20
Batch R4966116								
WG3254563-2 LCS								
Aluminum (Al)-Total			93.0		%		80-120	09-JAN-20
Antimony (Sb)-Total			98.0		%		80-120	09-JAN-20
Arsenic (As)-Total			97.9		%		80-120	09-JAN-20
Barium (Ba)-Total			100.9		%		80-120	09-JAN-20
Beryllium (Be)-Total			84.6		%		80-120	09-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4966116								
WG3254563-2 LCS								
Bismuth (Bi)-Total			96.7		%		80-120	09-JAN-20
Boron (B)-Total			81.8		%		80-120	09-JAN-20
Cadmium (Cd)-Total			103.0		%		80-120	09-JAN-20
Calcium (Ca)-Total			93.6		%		80-120	09-JAN-20
Cesium (Cs)-Total			100.1		%		80-120	09-JAN-20
Chromium (Cr)-Total			97.9		%		80-120	09-JAN-20
Cobalt (Co)-Total			100.7		%		80-120	09-JAN-20
Copper (Cu)-Total			98.4		%		80-120	09-JAN-20
Iron (Fe)-Total			93.1		%		80-120	09-JAN-20
Lead (Pb)-Total			95.7		%		80-120	09-JAN-20
Lithium (Li)-Total			85.3		%		80-120	09-JAN-20
Magnesium (Mg)-Total			104.5		%		80-120	09-JAN-20
Manganese (Mn)-Total			99.2		%		80-120	09-JAN-20
Molybdenum (Mo)-Total			96.4		%		80-120	09-JAN-20
Nickel (Ni)-Total			97.9		%		80-120	09-JAN-20
Potassium (K)-Total			98.0		%		80-120	09-JAN-20
Phosphorus (P)-Total			99.6		%		80-120	09-JAN-20
Rubidium (Rb)-Total			99.0		%		80-120	09-JAN-20
Selenium (Se)-Total			98.9		%		80-120	09-JAN-20
Silicon (Si)-Total			90.4		%		80-120	09-JAN-20
Silver (Ag)-Total			96.6		%		80-120	09-JAN-20
Sodium (Na)-Total			97.1		%		80-120	09-JAN-20
Strontium (Sr)-Total			99.5		%		80-120	09-JAN-20
Sulfur (S)-Total			91.0		%		80-120	09-JAN-20
Tellurium (Te)-Total			98.0		%		80-120	09-JAN-20
Thallium (Tl)-Total			94.3		%		80-120	09-JAN-20
Thorium (Th)-Total			99.0		%		80-120	09-JAN-20
Tin (Sn)-Total			96.4		%		80-120	09-JAN-20
Titanium (Ti)-Total			96.5		%		80-120	09-JAN-20
Tungsten (W)-Total			95.4		%		80-120	09-JAN-20
Uranium (U)-Total			104.4		%		80-120	09-JAN-20
Vanadium (V)-Total			95.6		%		80-120	09-JAN-20
Zinc (Zn)-Total			97.4		%		80-120	09-JAN-20
Zirconium (Zr)-Total			95.3		%		80-120	09-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4966116								
WG3254563-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	09-JAN-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	09-JAN-20
Boron (B)-Total			<0.010		mg/L		0.01	09-JAN-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	09-JAN-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	09-JAN-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	09-JAN-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-JAN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	09-JAN-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-JAN-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	09-JAN-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	09-JAN-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	09-JAN-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-JAN-20
Potassium (K)-Total			<0.050		mg/L		0.05	09-JAN-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	09-JAN-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	09-JAN-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	09-JAN-20
Silicon (Si)-Total			<0.10		mg/L		0.1	09-JAN-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	09-JAN-20
Sodium (Na)-Total			<0.050		mg/L		0.05	09-JAN-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	09-JAN-20
Sulfur (S)-Total			<0.50		mg/L		0.5	09-JAN-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	09-JAN-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	09-JAN-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	09-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4966116								
WG3254563-1 MB								
Tungsten (W)-Total			<0.00010		mg/L		0.0001	09-JAN-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	09-JAN-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	09-JAN-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-JAN-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	09-JAN-20
PAH,PANH-WP	**Water**							
Batch R4959944								
WG3249948-2 LCS								
1-Methyl Naphthalene			111.2		%		60-130	03-JAN-20
2-Methyl Naphthalene			100.8		%		60-130	03-JAN-20
Acenaphthene			112.7		%		60-130	03-JAN-20
Acenaphthylene			98.6		%		60-130	03-JAN-20
Anthracene			86.7		%		60-130	03-JAN-20
Acridine			96.9		%		60-130	03-JAN-20
Benzo(a)anthracene			112.6		%		60-130	03-JAN-20
Benzo(a)pyrene			92.9		%		60-130	03-JAN-20
Benzo(b&j)fluoranthene			116.3		%		60-130	03-JAN-20
Benzo(g,h,i)perylene			112.8		%		60-130	03-JAN-20
Benzo(k)fluoranthene			109.4		%		60-130	03-JAN-20
Chrysene			113.3		%		60-130	03-JAN-20
Dibenzo(a,h)anthracene			108.7		%		60-130	03-JAN-20
Fluoranthene			114.0		%		60-130	03-JAN-20
Fluorene			98.6		%		60-130	03-JAN-20
Indeno(1,2,3-cd)pyrene			102.0		%		60-130	03-JAN-20
Naphthalene			113.8		%		50-130	03-JAN-20
Phenanthrene			117.3		%		60-130	03-JAN-20
Pyrene			112.8		%		60-130	03-JAN-20
Quinoline			107.9		%		60-130	03-JAN-20
WG3249948-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	03-JAN-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	03-JAN-20
Acenaphthene			<0.000020		mg/L		0.00002	03-JAN-20
Acenaphthylene			<0.000020		mg/L		0.00002	03-JAN-20
Anthracene			<0.000010		mg/L		0.00001	03-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R4959944								
WG3249948-1 MB								
Acridine			<0.000020		mg/L		0.00002	03-JAN-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	03-JAN-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	03-JAN-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	03-JAN-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	03-JAN-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	03-JAN-20
Chrysene			<0.000020		mg/L		0.00002	03-JAN-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	03-JAN-20
Fluoranthene			<0.000020		mg/L		0.00002	03-JAN-20
Fluorene			<0.000020		mg/L		0.00002	03-JAN-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	03-JAN-20
Naphthalene			<0.000050		mg/L		0.00005	03-JAN-20
Phenanthrene			<0.000050		mg/L		0.00005	03-JAN-20
Pyrene			<0.000010		mg/L		0.00001	03-JAN-20
Quinoline			<0.000020		mg/L		0.00002	03-JAN-20
Surrogate: Acenaphthene d10			98.0		%		60-130	03-JAN-20
Surrogate: Acridine d9			88.1		%		60-130	03-JAN-20
Surrogate: Chrysene d12			99.6		%		60-130	03-JAN-20
Surrogate: Naphthalene d8			95.4		%		50-130	03-JAN-20
Surrogate: Phenanthrene d10			101.4		%		60-130	03-JAN-20
VOC+F1-HSMS-WP	**Water**							
Batch R4958822								
WG3250785-2 LCS								
Acetone			95.5		%		70-130	02-JAN-20
Benzene			96.9		%		70-130	02-JAN-20
Bromobenzene			104.0		%		70-130	02-JAN-20
Bromochloromethane			87.9		%		70-130	02-JAN-20
Bromodichloromethane			101.3		%		70-130	02-JAN-20
Bromoform			97.0		%		70-130	02-JAN-20
Bromomethane			97.9		%		60-140	02-JAN-20
n-Butylbenzene			120.9		%		70-130	02-JAN-20
sec-Butylbenzene			124.1		%		70-130	02-JAN-20
tert-Butylbenzene			121.4		%		70-130	02-JAN-20
Carbon disulfide			111.2		%		70-130	02-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4958822								
WG3250785-2 LCS								
Carbon Tetrachloride			111.6		%		70-130	02-JAN-20
Chlorobenzene			107.1		%		70-130	02-JAN-20
Chloroethane			99.1		%		60-140	02-JAN-20
Chloroform			90.9		%		70-130	02-JAN-20
Chloromethane			118.0		%		60-140	02-JAN-20
2-Chlorotoluene			117.5		%		70-130	02-JAN-20
4-Chlorotoluene			118.1		%		70-130	02-JAN-20
Dibromochloromethane			99.3		%		70-130	02-JAN-20
1,2-Dibromo-3-chloropropane			96.3		%		70-130	02-JAN-20
1,2-Dibromoethane			90.3		%		70-130	02-JAN-20
Dibromomethane			100.4		%		70-130	02-JAN-20
1,2-Dichlorobenzene			108.2		%		70-130	02-JAN-20
1,3-Dichlorobenzene			111.9		%		70-130	02-JAN-20
1,4-Dichlorobenzene			114.5		%		70-130	02-JAN-20
Dichlorodifluoromethane			132.0		%		60-140	02-JAN-20
1,1-dichloroethane			109.1		%		70-130	02-JAN-20
1,2-Dichloroethane			85.4		%		70-130	02-JAN-20
1,1-dichloroethene			106.6		%		70-130	02-JAN-20
cis-1,2-Dichloroethene			103.2		%		70-130	02-JAN-20
trans-1,2-Dichloroethene			112.5		%		70-130	02-JAN-20
Dichloromethane			105.0		%		70-130	02-JAN-20
1,2-Dichloropropane			98.9		%		70-130	02-JAN-20
1,3-Dichloropropane			90.9		%		70-130	02-JAN-20
2,2-Dichloropropane			118.8		%		70-130	02-JAN-20
1,1-Dichloropropene			113.0		%		70-130	02-JAN-20
cis-1,3-Dichloropropene			100.7		%		70-130	02-JAN-20
trans-1,3-Dichloropropene			94.0		%		70-130	02-JAN-20
Ethylbenzene			112.5		%		70-130	02-JAN-20
Hexachlorobutadiene			112.8		%		70-130	02-JAN-20
Hexane			115.9		%		70-130	02-JAN-20
2-Hexanone (Methyl butyl ketone)			108.9		%		70-130	02-JAN-20
Isopropylbenzene			119.7		%		70-130	02-JAN-20
4-Isopropyltoluene			121.6		%		70-130	02-JAN-20
MEK			114.1		%		70-130	02-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4958822								
WG3250785-2 LCS								
MIBK			108.2		%		70-130	02-JAN-20
MTBE			110.5		%		70-130	02-JAN-20
Styrene			111.6		%		70-130	02-JAN-20
1,1,1,2-Tetrachloroethane			105.9		%		70-130	02-JAN-20
1,1,2,2-Tetrachloroethane			90.8		%		70-130	02-JAN-20
Tetrachloroethene			106.0		%		70-130	02-JAN-20
Toluene			99.96		%		70-130	02-JAN-20
1,2,3-Trichlorobenzene			101.4		%		70-130	02-JAN-20
1,2,4-Trichlorobenzene			102.4		%		70-130	02-JAN-20
1,1,1-Trichloroethane			119.0		%		70-130	02-JAN-20
1,1,2-Trichloroethane			96.3		%		70-130	02-JAN-20
Trichloroethene			119.7		%		70-130	02-JAN-20
Trichlorofluoromethane			108.8		%		60-140	02-JAN-20
1,2,3-Trichloropropane			98.9		%		70-130	02-JAN-20
1,2,4-Trimethylbenzene			119.9		%		70-130	02-JAN-20
1,3,5-Trimethylbenzene			121.8		%		70-130	02-JAN-20
Vinyl Chloride			113.5		%		60-140	02-JAN-20
M+P-Xylenes			102.4		%		70-130	02-JAN-20
o-Xylene			110.4		%		70-130	02-JAN-20
WG3250785-4 LCS								
F1			92.0		%		70-130	02-JAN-20
WG3250785-1 MB								
Acetone			<0.050		mg/L		0.05	30-DEC-19
Benzene			<0.00050		mg/L		0.0005	30-DEC-19
Bromobenzene			<0.0010		mg/L		0.001	30-DEC-19
Bromochloromethane			<0.0010		mg/L		0.001	30-DEC-19
Bromodichloromethane			<0.00050		mg/L		0.0005	30-DEC-19
Bromoform			<0.0010		mg/L		0.001	30-DEC-19
Bromomethane			<0.0010		mg/L		0.001	30-DEC-19
n-Butylbenzene			<0.0010		mg/L		0.001	30-DEC-19
sec-Butylbenzene			<0.0010		mg/L		0.001	30-DEC-19
tert-Butylbenzene			<0.0010		mg/L		0.001	30-DEC-19
Carbon disulfide			<0.0050		mg/L		0.005	30-DEC-19
Carbon Tetrachloride			<0.00050		mg/L		0.0005	30-DEC-19
Chlorobenzene			<0.0010		mg/L		0.001	30-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4958822								
WG3250785-1 MB								
Chloroethane			<0.0010		mg/L		0.001	30-DEC-19
Chloroform			<0.00050		mg/L		0.0005	30-DEC-19
Chloromethane			<0.0050		mg/L		0.005	30-DEC-19
2-Chlorotoluene			<0.020		mg/L		0.02	30-DEC-19
4-Chlorotoluene			<0.0010		mg/L		0.001	30-DEC-19
Dibromochloromethane			<0.00050		mg/L		0.0005	30-DEC-19
1,2-Dibromo-3-chloropropane			<0.0010		mg/L		0.001	30-DEC-19
1,2-Dibromoethane			<0.0010		mg/L		0.001	30-DEC-19
Dibromomethane			<0.0010		mg/L		0.001	30-DEC-19
1,2-Dichlorobenzene			<0.00050		mg/L		0.0005	30-DEC-19
1,3-Dichlorobenzene			<0.0010		mg/L		0.001	30-DEC-19
1,4-Dichlorobenzene			<0.0010		mg/L		0.001	30-DEC-19
Dichlorodifluoromethane			<0.0010		mg/L		0.001	30-DEC-19
1,1-dichloroethane			<0.00050		mg/L		0.0005	30-DEC-19
1,2-Dichloroethane			<0.00050		mg/L		0.0005	30-DEC-19
1,1-dichloroethene			<0.00050		mg/L		0.0005	30-DEC-19
cis-1,2-Dichloroethene			<0.0010		mg/L		0.001	30-DEC-19
trans-1,2-Dichloroethene			<0.0010		mg/L		0.001	30-DEC-19
Dichloromethane			<0.0050		mg/L		0.005	30-DEC-19
1,2-Dichloropropane			<0.0010		mg/L		0.001	30-DEC-19
1,3-Dichloropropane			<0.0010		mg/L		0.001	30-DEC-19
2,2-Dichloropropane			<0.0020		mg/L		0.002	30-DEC-19
1,1-Dichloropropene			<0.0010		mg/L		0.001	30-DEC-19
cis-1,3-Dichloropropene			<0.0020		mg/L		0.002	30-DEC-19
trans-1,3-Dichloropropene			<0.0020		mg/L		0.002	30-DEC-19
Ethylbenzene			<0.00050		mg/L		0.0005	30-DEC-19
F1			<0.10		mg/L		0.1	30-DEC-19
Hexachlorobutadiene			<0.0020		mg/L		0.002	30-DEC-19
Hexane			<0.0010		mg/L		0.001	30-DEC-19
2-Hexanone (Methyl butyl ketone)			<0.020		mg/L		0.02	30-DEC-19
Isopropylbenzene			<0.0010		mg/L		0.001	30-DEC-19
4-Isopropyltoluene			<0.0010		mg/L		0.001	30-DEC-19
MEK			<0.020		mg/L		0.02	30-DEC-19
MIBK			<0.020		mg/L		0.02	30-DEC-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4958822								
WG3250785-1 MB								
MTBE			<0.00050		mg/L		0.0005	30-DEC-19
Styrene			<0.0010		mg/L		0.001	30-DEC-19
1,1,1,2-Tetrachloroethane			<0.00050		mg/L		0.0005	30-DEC-19
1,1,2,2-Tetrachloroethane			<0.00050		mg/L		0.0005	30-DEC-19
Tetrachloroethene			<0.00050		mg/L		0.0005	30-DEC-19
Toluene			<0.00050		mg/L		0.0005	30-DEC-19
1,2,3-Trichlorobenzene			<0.0010		mg/L		0.001	30-DEC-19
1,2,4-Trichlorobenzene			<0.0010		mg/L		0.001	30-DEC-19
1,1,1-Trichloroethane			<0.00050		mg/L		0.0005	30-DEC-19
1,1,2-Trichloroethane			<0.00050		mg/L		0.0005	30-DEC-19
Trichloroethene			<0.00050		mg/L		0.0005	30-DEC-19
Trichlorofluoromethane			<0.0010		mg/L		0.001	30-DEC-19
1,2,3-Trichloropropane			<0.0010		mg/L		0.001	30-DEC-19
1,2,4-Trimethylbenzene			<0.0010		mg/L		0.001	30-DEC-19
1,3,5-Trimethylbenzene			<0.0010		mg/L		0.001	30-DEC-19
Vinyl Chloride			<0.00050		mg/L		0.0005	30-DEC-19
M+P-Xylenes			<0.00040		mg/L		0.0004	30-DEC-19
o-Xylene			<0.00050		mg/L		0.0005	30-DEC-19
Surrogate: 4-Bromofluorobenzene (SS)			88.9		%		70-130	30-DEC-19
Surrogate: 1,4-Difluorobenzene (SS)			99.5		%		70-130	30-DEC-19
Surrogate: 3,4-Dichlorotoluene (SS)			103.0		%		70-130	30-DEC-19

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

January 8, 2020

Ms. Judy Dalmaijer
ALS Environmental-Winnipeg MB
Unit 12–1329 Niakwa Road East
Winnipeg, MB, R2J 3T4

Certificate of Analysis

Project Name:	**TOX**	Workorder:	**3077356**
Purchase Order:		Workorder ID:	**L2399352**

Dear Ms. Dalmaijer:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, December 24, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Sarah S Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Bea Ryback , Mr. Craig Riddell

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3077356 L2399352

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3077356001	L2399352-1 TH19-04	Water	12/20/2019 00:00	12/24/2019 11:04	Collected by Client
3077356002	L2399352-2 TH19-03	Water	12/20/2019 00:00	12/24/2019 11:04	Collected by Client
3077356003	L2399352-3 TH19-10	Water	12/20/2019 00:00	12/24/2019 11:04	Collected by Client
3077356004	L2399352-4 TH19-08	Water	12/20/2019 00:00	12/24/2019 11:04	Collected by Client
3077356005	L2399352-5 TH19-07	Water	12/20/2019 00:00	12/24/2019 11:04	Collected by Client
3077356006	L2399352-6 DUP1	Water	12/20/2019 00:00	12/24/2019 11:04	Collected by Client

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SAMPLE SUMMARY

Workorder: 3077356 L2399352

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3077356 L2399352

Lab ID: **3077356001** Date Collected: 12/20/2019 00:00 Matrix: Water

Sample ID: **L2399352-1 TH19-04** Date Received: 12/24/2019 11:04

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	58.4		ug/L	20.0	SW846 9020B			1/8/20 11:51	PAG	A

Ms. Sarah S Leung
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3077356 L2399352

Lab ID: **3077356002** Date Collected: 12/20/2019 00:00 Matrix: Water

Sample ID: **L2399352-2 TH19-03** Date Received: 12/24/2019 11:04

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	51.0		ug/L	20.0	SW846 9020B			1/8/20 12:18	PAG	A

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ANALYTICAL RESULTS

Workorder: 3077356 L2399352

Lab ID: **3077356003** Date Collected: 12/20/2019 00:00 Matrix: Water

Sample ID: **L2399352-3 TH19-10** Date Received: 12/24/2019 11:04

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	82.4		ug/L	20.0	SW846 9020B			1/8/20 12:48	PAG	A

Ms. Sarah S Leung
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3077356 L2399352

Lab ID: **3077356004** Date Collected: 12/20/2019 00:00 Matrix: Water

Sample ID: **L2399352-4 TH19-08** Date Received: 12/24/2019 11:04

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			1/8/20 14:26	PAG	A

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ANALYTICAL RESULTS

Workorder: 3077356 L2399352

Lab ID: **3077356005** Date Collected: 12/20/2019 00:00 Matrix: Water

Sample ID: **L2399352-5 TH19-07** Date Received: 12/24/2019 11:04

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	77.8		ug/L	20.0	SW846 9020B			1/8/20 14:56	PAG	A

Ms. Sarah S Leung
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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3077356 L2399352

Lab ID: **3077356006** Date Collected: 12/20/2019 00:00 Matrix: Water

Sample ID: **L2399352-6 DUP1** Date Received: 12/24/2019 11:04

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	54.6		ug/L	20.0	SW846 9020B			1/8/20 15:27	PAG	A

Ms. Sarah S Leung
Project Coordinator

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3077356 L2399352

Lab ID	Sample ID	Analysis Method	Prep Method
3077356001	L2399352-1 TH19-04	SW846 9020B	
3077356002	L2399352-2 TH19-03	SW846 9020B	
3077356003	L2399352-3 TH19-10	SW846 9020B	
3077356004	L2399352-4 TH19-08	SW846 9020B	
3077356005	L2399352-5 TH19-07	SW846 9020B	
3077356006	L2399352-6 DUP1	SW846 9020B	

QUALITY CONTROL DATA

Workorder: 3077356 L2399352

QC Batch: WETC/232874 **Analysis Method:** SW846 9020B

QC Batch Method: SW846 9020B

Associated Lab Samples: 3077356001, 3077356002, 3077356003, 3077356004, 3077356005, 3077356006

METHOD BLANK: 3070455

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	ug/L	10.0

LABORATORY CONTROL SAMPLE: 3070456

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	107	ug/L	100	107	80 - 120

LABORATORY CONTROL SAMPLE: 3070457

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	97	ug/L	100	97.0	80 - 120

METHOD BLANK: 3070459

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	ug/L	200

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3077356 L2399352

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3077356001	L2399352-1 TH19-04			SW846 9020B	WETC/232874
3077356002	L2399352-2 TH19-03			SW846 9020B	WETC/232874
3077356003	L2399352-3 TH19-10			SW846 9020B	WETC/232874
3077356004	L2399352-4 TH19-08			SW846 9020B	WETC/232874
3077356005	L2399352-5 TH19-07			SW846 9020B	WETC/232874
3077356006	L2399352-6 DUP1			SW846 9020B	WETC/232874

ALS Environmental

3077356
L2399352
WINNIPEG

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
34 DOGWOOD LANE
MIDDLETOWN,PENNSYLVANIA 17057

WP-SHIPTO-SU-MON

NOTES: Please reference on final report and invoice: PO# L2399
ALS requires QC data to be provided with your final results.

Please see enclosed 6 **sample(s) in** 6 **Container(s)**

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
x2 L2399352-1 TH19-04	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 20/ 2019 / 1/17/2020	
x2 L2399352-2 TH19-03	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 20/ 2019 / 1/17/2020	
x2 L2399352-3 TH19-10	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 20/ 2019 / 1/17/2020	
x2 L2399352-4 TH19-08	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 20/ 2019 / 1/17/2020	
x2 L2399352-5 TH19-09 (W12-24-19)	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 20/ 2019 / 1/17/2020	
x2 L2399352-6 DUP1	Extractable Organic Halides (EOX) (EOX-MP 14)	12/ 20/ 2019 / 1/17/2020	

W 12/20/19

6° 3/8

riday, December 20, 2019 2:43 PM

3077356
L2399352

WINNIPEG

ALS Environmental

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
34 DOGWOOD LANE
MIDDLETOWN,PENNSYLVANIA 17057

Subcontract Info Contact: Judy Dalmaijer (204) 255-9749

Analysis and reporting info contact: Judy Dalmaijer
12-1329 NIAKWA ROAD E
WINNIPEG,MB R2J3T4
Phone: (204) 255-9749 Email: Judy.Dalmaijer@alsglobal.com

Please email confirmation of receipt to: **Judy.Dalmaijer@alsglobal.com**

Shipped By: Ice Date Shipped: 12/12

Received By: FedEx Date Received:

~~Verified By~~: Rec'd Christine ALS MDT Date ~~Verified~~: Rec'd 12-24-19 1104

Temperature:

Sample Integrity Issues:

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: ALS Winnipeg | Work Order #: 3077356 | Initials: LW | Date: 12-24-19

1. Were airbills / tracking numbers present and recorded?	NONE	(YES)	NO
Tracking number: 1Z 662 F45 15 6726 4576			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	(NO)
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	(NO)
5c. Does the COC contain sample collectors name?		YES	(NO)
5d. Does the COC note the type(s) of preservation for all bottles?		YES	(NO)
5e. Does the COC note the number of bottles submitted for each sample?		YES	(NO)
5f. Does the COC note the type of sample, composite or grab?		YES	(NO)
5g. Does the COC note the matrix of the sample(s)?		YES	(NO)
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: 1

Temperature (°C): 6

Thermometer ID: 318

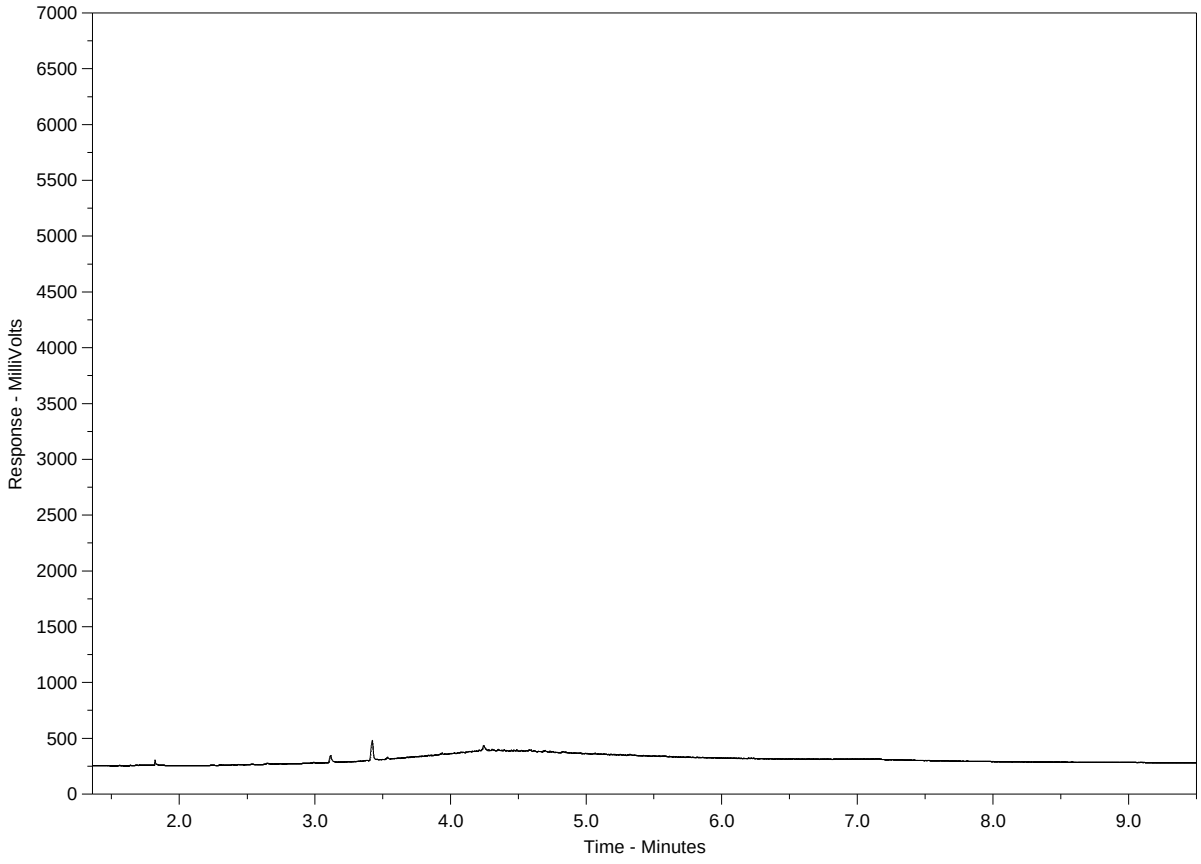
Radiological (µCi): _____

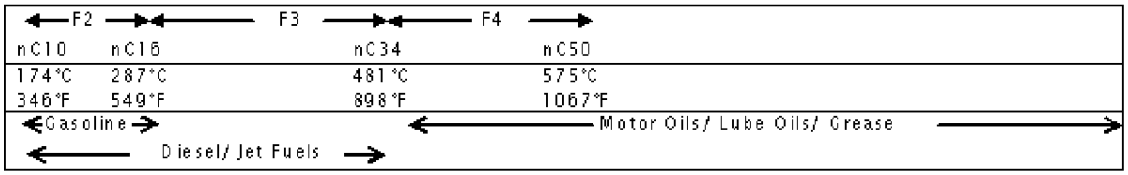
COMMENTS (Required for all NO responses above and any sample non-conformance):
Added # bottles. Waters - not DW. No c/o. No collector. No times.

Rev. 4/29/2019

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2399352-1
Client Sample ID: TH19-04





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

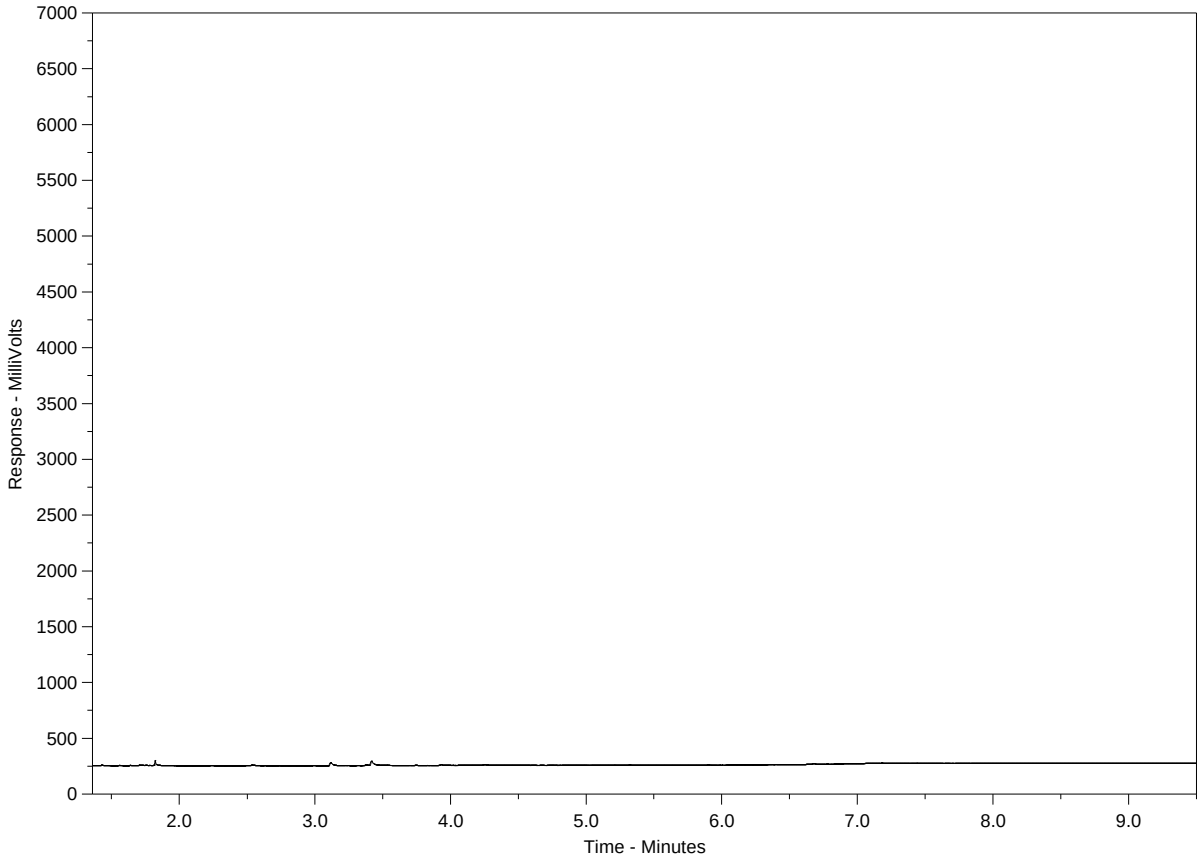
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

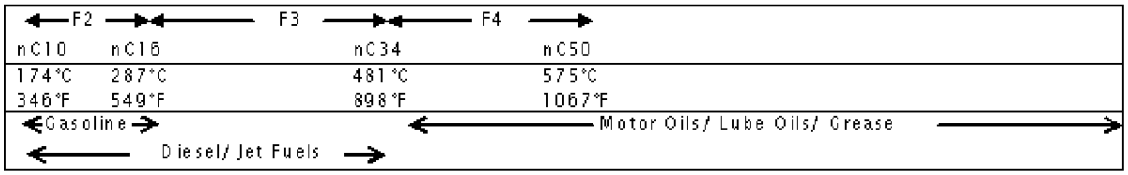
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2399352-2
Client Sample ID: TH19-03





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

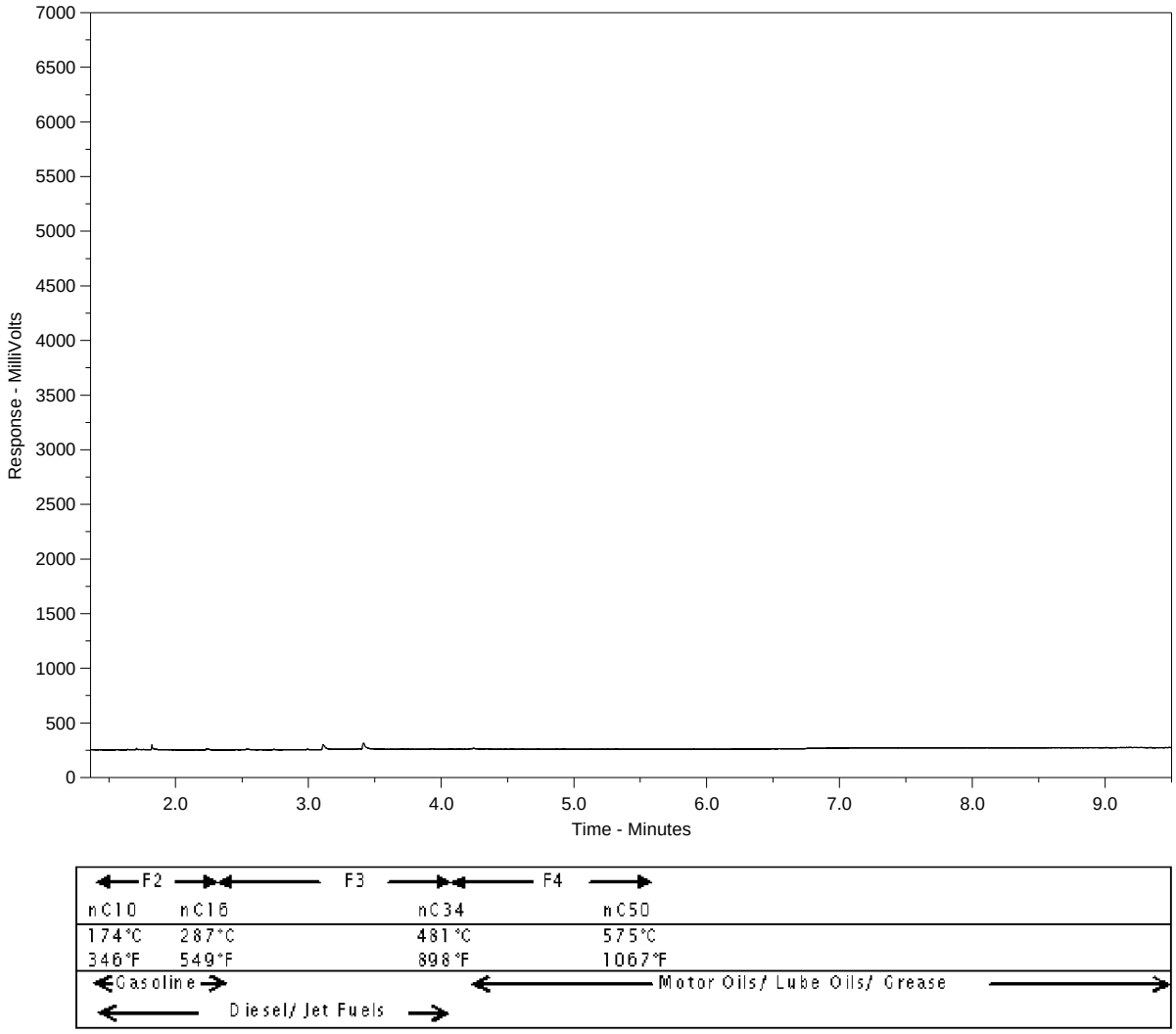
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2399352-3
Client Sample ID: TH19-10



The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

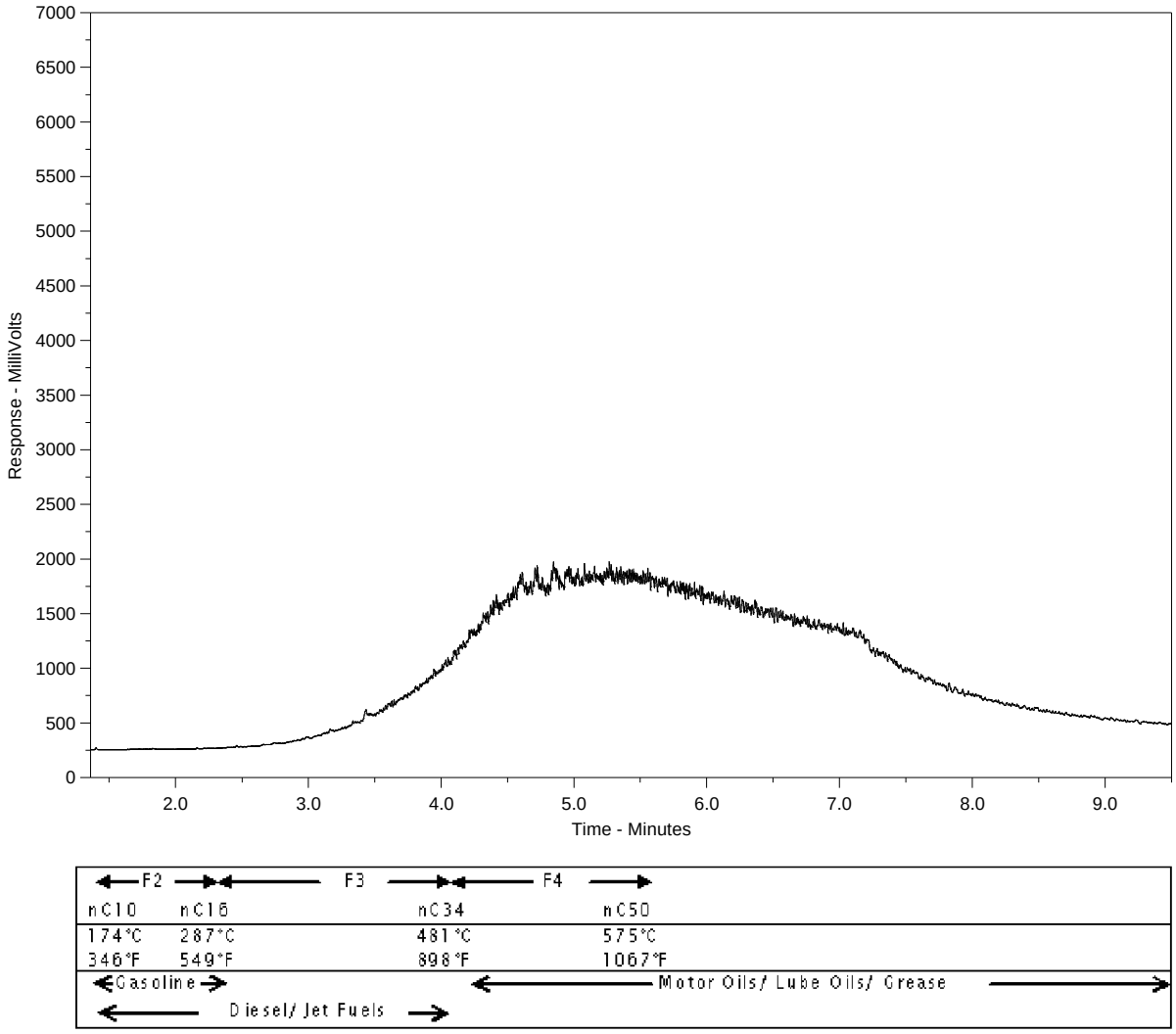
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2399352-4
Client Sample ID: TH19-08



The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

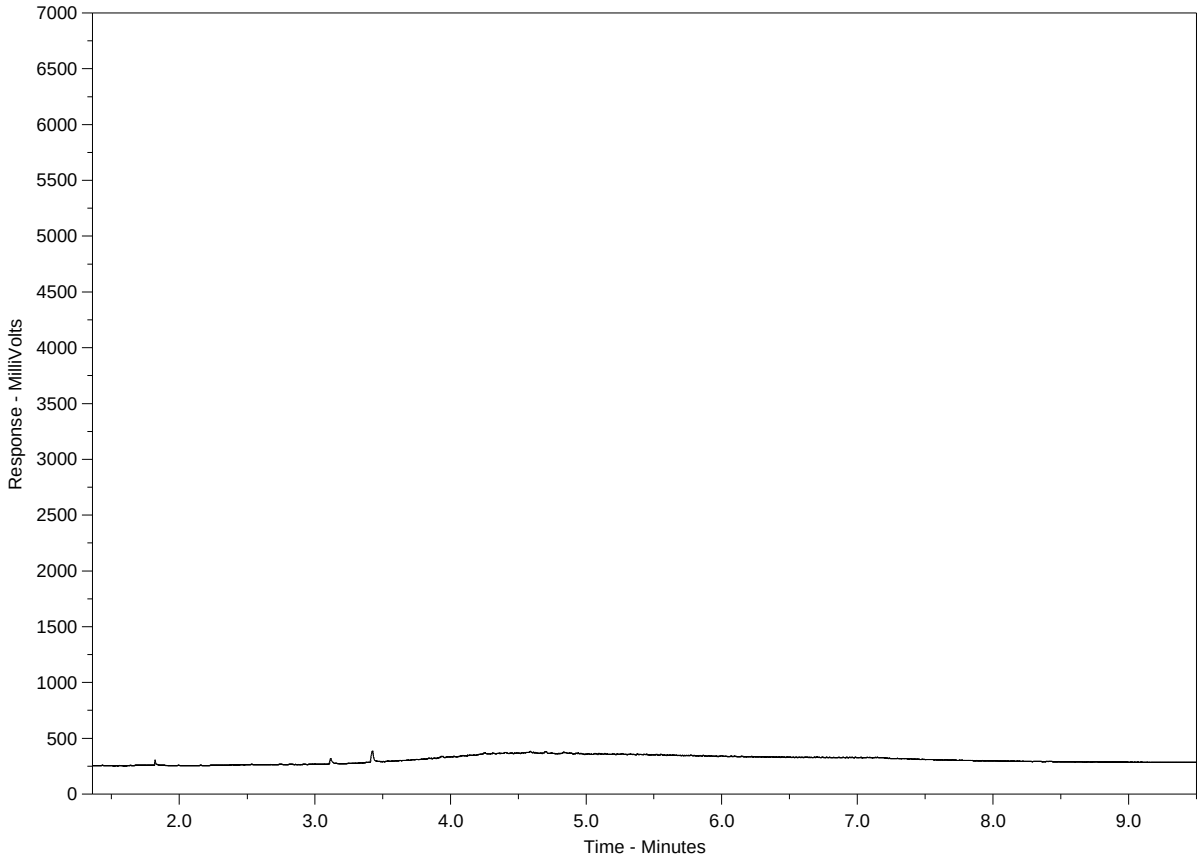
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

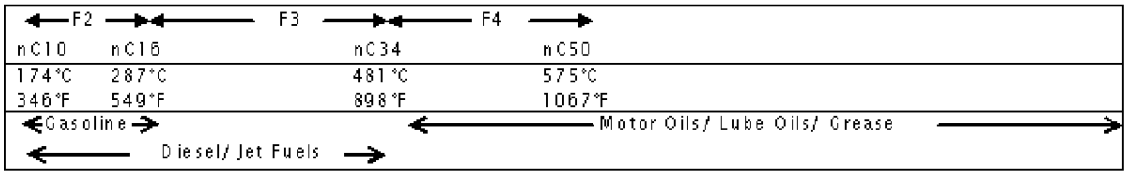
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2399352-5
Client Sample ID: TH19-07





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

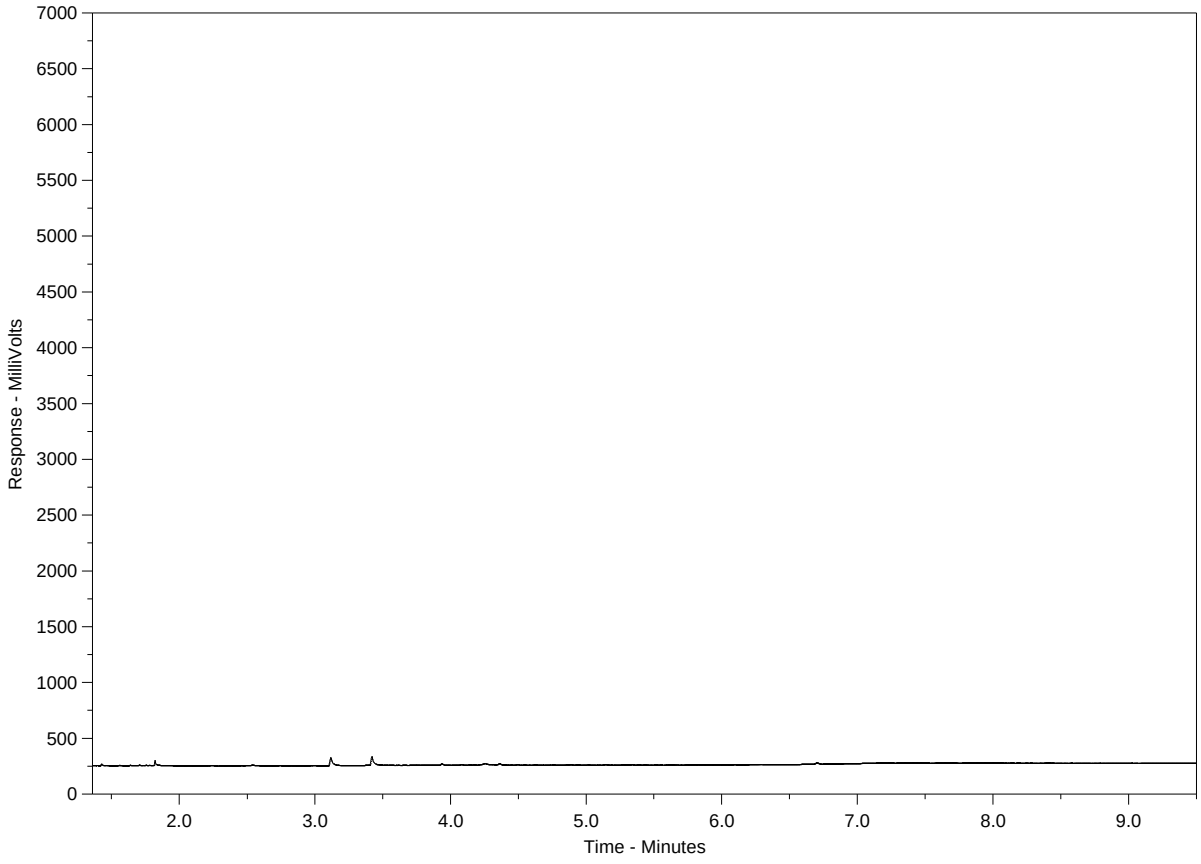
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

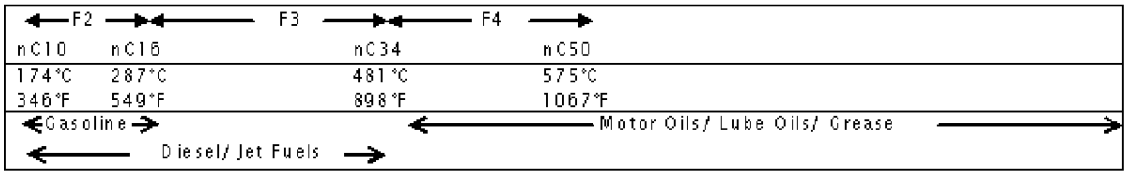
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2399352-6
Client Sample ID: DUP1





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2399352-COFC

COC Number: 17 - 782615

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Wood
Contact:	Justin Huberdeau
Phone:	
	Company address below will appear on the final report
Street:	440 Dovercourt
City/Province:	Wpg, MB
Postal Code:	

Report Format / Distribution	
Select Report Format:	[✓] PDF [✓] EXCEL [ ] EDD (DIGITAL)
Quality Control (QC) Report with Report	[✓] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	[✓] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	justin.huberdeau@woodplc.com
Email 2	angelacerilli@woodplc.com
Email 3	

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] [✓] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ] 3 day [P3-25%] [ ] 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E - 100%] [ ] Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] [ ]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Invoice To	
Same as Report To	[✓] YES [ ] NO
Copy of Invoice with Report	[ ] YES [✓] NO
Company:	
Contact:	

Invoice Distribution	
Select Invoice Distribution:	[ ] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	
Email 2	

Project Information	
ALS Account # / Quote #:	W5235
Job #:	WX18979
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	HR-1613B Dioxans + Furans	EOX/Total Org Halides (NB)	Mercury (BC)	Metals (BC) (Tot)	PAHs	VOC/BTEX, F1-F4	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	TH19-04	20-12-19	12:00	GW		X	X	X	X	X	X		
	TH19-03	↓	12:30	↓		X	X	X	X	X	X		
	TH19-10	↓	13:00	↓		X	X	X	X	X	X		
	TH19-08	↓	13:30	↓		X	X	X	X	X	X		
	TH19-07	↓	14:00	↓		X	X	X	X	X	X		
	DUP1	↓	12:45	↓		X	X	X	X	X	X		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? [ ] YES [✓] NO

Are samples for human consumption/ use? [ ] YES [ ] NO (circled)

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

TH19-07 limited sample 6120 for Dioxans + furans + PLEASE CROSS REFERENCE ANALYSIS WITH ACCNT #

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ]		SIF Observations	Yes [ ]	No [ ]	
Ice Packs [ ]	Ice Cubes [ ]	Custody seal intact	Yes [ ]	No [ ]	
Cooling Initiated [ ]					

INITIAL COOLER TEMPERATURES °C: 2.6

FINAL COOLER TEMPERATURES °C:

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: A. Cerilli	Date:	Time:	Received by: [signature]	Date: Dec 20	Time: 325	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

Wood Environment & Infrastructure Solutions (Winnipeg)
ATTN: KEVIN BEECHINOR
440 Dovercourt Drive
Winnipeg MB R3Y 1G4

Date Received: 08-JAN-20
Report Date: 08-MAY-20 15:16 (MT)
Version: FINAL REV. 2

Client Phone: 204-488-2997

Certificate of Analysis

Lab Work Order #: L2403662

Project P.O. #: NOT SUBMITTED
Job Reference: WX18979
C of C Numbers:
Legal Site Desc:

Comments:

8-MAY-2020 AMENDED REPORT - Dioxin & Furan Results removed from report for frac -1 only

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-1 TH19-01							
Sampled By: CLIENT on 08-JAN-20 @ 13:30							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					15-JAN-20	R4972120
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	14-JAN-20	14-JAN-20	R4969808
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.102		0.0030	mg/L	31-JAN-20	03-FEB-20	R4987627
Antimony (Sb)-Total	0.00026		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Arsenic (As)-Total	0.00093		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Barium (Ba)-Total	0.0315		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Boron (B)-Total	0.173		0.010	mg/L	31-JAN-20	03-FEB-20	R4987627
Cadmium (Cd)-Total	0.000196		0.0000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Calcium (Ca)-Total	514		0.50	mg/L	31-JAN-20	05-FEB-20	R4990584
Cesium (Cs)-Total	0.000021		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Chromium (Cr)-Total	0.00078		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Cobalt (Co)-Total	0.00552		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Copper (Cu)-Total	0.00618		0.00050	mg/L	31-JAN-20	03-FEB-20	R4987627
Iron (Fe)-Total	0.187		0.010	mg/L	31-JAN-20	03-FEB-20	R4987627
Lead (Pb)-Total	0.000404		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Lithium (Li)-Total	0.612		0.0010	mg/L	31-JAN-20	03-FEB-20	R4987627
Magnesium (Mg)-Total	407		0.050	mg/L	31-JAN-20	05-FEB-20	R4990584
Manganese (Mn)-Total	3.56		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Molybdenum (Mo)-Total	0.00339		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Nickel (Ni)-Total	0.0208		0.00050	mg/L	31-JAN-20	03-FEB-20	R4987627
Potassium (K)-Total	11.4		0.050	mg/L	31-JAN-20	03-FEB-20	R4987627
Phosphorus (P)-Total	0.091		0.030	mg/L	31-JAN-20	03-FEB-20	R4987627
Rubidium (Rb)-Total	0.00177		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Selenium (Se)-Total	0.00214		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Silicon (Si)-Total	11.2		0.10	mg/L	31-JAN-20	03-FEB-20	R4987627
Silver (Ag)-Total	0.000019		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Sodium (Na)-Total	291		0.050	mg/L	31-JAN-20	03-FEB-20	R4987627
Strontium (Sr)-Total	3.37		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Sulfur (S)-Total	1010		5.0	mg/L	31-JAN-20	05-FEB-20	R4990584
Tellurium (Te)-Total	0.00022		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Thallium (Tl)-Total	0.000020		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Tin (Sn)-Total	0.00841		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Titanium (Ti)-Total	0.00413		0.00030	mg/L	31-JAN-20	03-FEB-20	R4987627
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Uranium (U)-Total	0.110		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Vanadium (V)-Total	0.00158		0.00050	mg/L	31-JAN-20	03-FEB-20	R4987627
Zinc (Zn)-Total	0.0217		0.0030	mg/L	31-JAN-20	03-FEB-20	R4987627
Zirconium (Zr)-Total	0.00098		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Acenaphthene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Acenaphthylene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Anthracene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Acridine	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(a)anthracene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	13-JAN-20	13-JAN-20	R4964572

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-1 TH19-01							
Sampled By: CLIENT on 08-JAN-20 @ 13:30							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Chrysene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Fluoranthene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Fluorene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Naphthalene	<0.000050		0.000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Phenanthrene	<0.000050		0.000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Pyrene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Quinoline	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	13-JAN-20	13-JAN-20	R4964572
Surrogate: Acenaphthene d10	89.3		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Acridine d9	100.2		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Chrysene d12	100.1		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Naphthalene d8	87.1		50-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Phenanthrene d10	101.9		60-130	%	13-JAN-20	13-JAN-20	R4964572
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	09-JAN-20	09-JAN-20	R4965831
F3 (C16-C34)	0.38		0.25	mg/L	09-JAN-20	09-JAN-20	R4965831
F4 (C34-C50)	<0.25		0.25	mg/L	09-JAN-20	09-JAN-20	R4965831
Surrogate: 2-Bromobenzotrifluoride	104.6		60-140	%	09-JAN-20	09-JAN-20	R4965831
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		16-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		16-JAN-20	
F3-PAH	0.38		0.25	mg/L		16-JAN-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		16-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		16-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		13-JAN-20	R4971648
Benzene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Bromobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Bromochloromethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Bromodichloromethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Bromoform	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Bromomethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
n-Butylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
sec-Butylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
tert-Butylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Carbon disulfide	<0.0050		0.0050	mg/L		13-JAN-20	R4971648
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Chlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Chloroethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Chloroform	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Chloromethane	<0.0050		0.0050	mg/L		13-JAN-20	R4971648
2-Chlorotoluene	<0.020		0.020	mg/L		13-JAN-20	R4971648
4-Chlorotoluene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-1 TH19-01							
Sampled By: CLIENT on 08-JAN-20 @ 13:30							
Matrix: GW							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2-Dibromoethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dibromomethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dichloromethane	<0.0050		0.0050	mg/L		13-JAN-20	R4971648
1,2-Dichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,3-Dichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
2,2-Dichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1-Dichloropropene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Ethylbenzene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
F1	<0.10		0.10	mg/L		13-JAN-20	R4971648
Hexachlorobutadiene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Hexane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-JAN-20	R4971648
Isopropylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
MEK	<0.020		0.020	mg/L		13-JAN-20	R4971648
MIBK	<0.020		0.020	mg/L		13-JAN-20	R4971648
MTBE	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Styrene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Tetrachloroethene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Toluene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Trichloroethene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Vinyl Chloride	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
M+P-Xylenes	<0.00040		0.00040	mg/L		13-JAN-20	R4971648
o-Xylene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Surrogate: 4-Bromofluorobenzene (SS)	85.8		70-130	%		13-JAN-20	R4971648
Surrogate: 1,4-Difluorobenzene (SS)	102.4		70-130	%		13-JAN-20	R4971648
Surrogate: 3,4-Dichlorotoluene (SS)	79.5		70-130	%		13-JAN-20	R4971648

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-2 WELL SHOP (TAP SOP ON BOTTLES)							
Sampled By: CLIENT on 08-JAN-20 @ 14:30							
Matrix: GW							
Miscellaneous Parameters							
Extractable Organic Halides (EOX)	See Attached					15-JAN-20	R4972120
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	14-JAN-20	14-JAN-20	R4969808
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	<0.0030		0.0030	mg/L	31-JAN-20	03-FEB-20	R4987627
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Arsenic (As)-Total	0.00017		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Barium (Ba)-Total	0.0181		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Boron (B)-Total	0.094		0.010	mg/L	31-JAN-20	03-FEB-20	R4987627
Cadmium (Cd)-Total	0.0000117		0.0000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Calcium (Ca)-Total	42.9		0.050	mg/L	31-JAN-20	03-FEB-20	R4987627
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Cobalt (Co)-Total	0.00047		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Copper (Cu)-Total	0.0169		0.00050	mg/L	31-JAN-20	03-FEB-20	R4987627
Iron (Fe)-Total	2.26		0.010	mg/L	31-JAN-20	03-FEB-20	R4987627
Lead (Pb)-Total	0.00279		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Lithium (Li)-Total	0.0364		0.0010	mg/L	31-JAN-20	03-FEB-20	R4987627
Magnesium (Mg)-Total	46.0		0.0050	mg/L	31-JAN-20	03-FEB-20	R4987627
Manganese (Mn)-Total	0.0552		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Molybdenum (Mo)-Total	0.000607		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Nickel (Ni)-Total	0.00103		0.00050	mg/L	31-JAN-20	03-FEB-20	R4987627
Potassium (K)-Total	3.70		0.050	mg/L	31-JAN-20	03-FEB-20	R4987627
Phosphorus (P)-Total	<0.030		0.030	mg/L	31-JAN-20	03-FEB-20	R4987627
Rubidium (Rb)-Total	0.00138		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Selenium (Se)-Total	<0.000050		0.000050	mg/L	31-JAN-20	03-FEB-20	R4987627
Silicon (Si)-Total	3.89		0.10	mg/L	31-JAN-20	03-FEB-20	R4987627
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Sodium (Na)-Total	25.7		0.050	mg/L	31-JAN-20	03-FEB-20	R4987627
Strontium (Sr)-Total	0.211		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Sulfur (S)-Total	23.6		0.50	mg/L	31-JAN-20	03-FEB-20	R4987627
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	31-JAN-20	03-FEB-20	R4987627
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-JAN-20	03-FEB-20	R4987627
Uranium (U)-Total	0.00103		0.000010	mg/L	31-JAN-20	03-FEB-20	R4987627
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-JAN-20	03-FEB-20	R4987627
Zinc (Zn)-Total	0.211		0.0030	mg/L	31-JAN-20	03-FEB-20	R4987627
Zirconium (Zr)-Total	0.00042		0.00020	mg/L	31-JAN-20	03-FEB-20	R4987627
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Acenaphthene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Acenaphthylene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Anthracene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Acridine	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(a)anthracene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	13-JAN-20	13-JAN-20	R4964572

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-2 WELL SHOP (TAP SOP ON BOTTLES)							
Sampled By: CLIENT on 08-JAN-20 @ 14:30							
Matrix: GW							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Chrysene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Fluoranthene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Fluorene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Naphthalene	<0.000050		0.000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Phenanthrene	<0.000050		0.000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Pyrene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Quinoline	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	13-JAN-20	13-JAN-20	R4964572
Surrogate: Acenaphthene d10	95.6		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Acridine d9	93.8		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Chrysene d12	115.4		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Naphthalene d8	92.9		50-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Phenanthrene d10	102.1		60-130	%	13-JAN-20	13-JAN-20	R4964572
Dioxins and Furans HR 1613B							
2,3,7,8-TCDD	<0.46	[U]	0.46	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,7,8-PeCDD	<0.26	[U]	0.26	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,4,7,8-HxCDD	<0.34	[U]	0.34	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,6,7,8-HxCDD	<0.34	[U]	0.34	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,7,8,9-HxCDD	<0.34	[U]	0.34	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,4,6,7,8-HpCDD	0.73	M,J,R	0.40	pg/L	21-JAN-20	23-JAN-20	R4976949
OCDD	3.11	M,J,B	0.49	pg/L	21-JAN-20	23-JAN-20	R4976949
2,3,7,8-TCDF	<0.32	[U]	0.32	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,7,8-PeCDF	0.34	M,J	0.20	pg/L	21-JAN-20	23-JAN-20	R4976949
2,3,4,7,8-PeCDF	<0.18	[U]	0.18	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,4,7,8-HxCDF	<0.19	[U]	0.19	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,6,7,8-HxCDF	<0.20	[U]	0.20	pg/L	21-JAN-20	23-JAN-20	R4976949
2,3,4,6,7,8-HxCDF	<0.19	[U]	0.19	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,7,8,9-HxCDF	0.56	M,J,B	0.24	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,4,6,7,8-HpCDF	<0.26	[U]	0.26	pg/L	21-JAN-20	23-JAN-20	R4976949
1,2,3,4,7,8,9-HpCDF	<0.31	M,U	0.31	pg/L	21-JAN-20	23-JAN-20	R4976949
OCDF	1.19	M,J	0.52	pg/L	21-JAN-20	23-JAN-20	R4976949
Total-TCDD	<0.46	[U]	0.46	pg/L	21-JAN-20	23-JAN-20	R4976949
Total TCDD # Homologues	0				21-JAN-20	23-JAN-20	R4976949
Total-PeCDD	<0.26	[U]	0.26	pg/L	21-JAN-20	23-JAN-20	R4976949
Total PeCDD # Homologues	0				21-JAN-20	23-JAN-20	R4976949
Total-HxCDD	<0.34	[U]	0.34	pg/L	21-JAN-20	23-JAN-20	R4976949
Total HxCDD # Homologues	0				21-JAN-20	23-JAN-20	R4976949
Total-HpCDD	<0.40	[U]	0.40	pg/L	21-JAN-20	23-JAN-20	R4976949
Total HpCDD # Homologues	0				21-JAN-20	23-JAN-20	R4976949
Total-TCDF	<0.32	[U]	0.32	pg/L	21-JAN-20	23-JAN-20	R4976949
Total TCDF # Homologues	0				21-JAN-20	23-JAN-20	R4976949
Total-PeCDF	0.34		0.20	pg/L	21-JAN-20	23-JAN-20	R4976949
Total PeCDF # Homologues	1				21-JAN-20	23-JAN-20	R4976949
Total-HxCDF	0.56		0.24	pg/L	21-JAN-20	23-JAN-20	R4976949
Total HxCDF # Homologues	1				21-JAN-20	23-JAN-20	R4976949
Total-HpCDF	<0.31	[U]	0.31	pg/L	21-JAN-20	23-JAN-20	R4976949

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-2 WELL SHOP (TAP SOP ON BOTTLES)							
Sampled By: CLIENT on 08-JAN-20 @ 14:30							
Matrix: GW							
Dioxins and Furans HR 1613B							
Total HpCDF # Homologues	0				21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-2,3,7,8-TCDD	84.0		20-175	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,7,8-PeCDD	86.0		21-227	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	88.0		21-193	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		25-163	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	82.0		23-166	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-OCDD	49.0		13-138	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-2,3,7,8-TCDF	84.0		22-152	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,7,8-PeCDF	87.0		24-185	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-2,3,4,7,8-PeCDF	82.0		21-178	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	84.0		26-152	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	81.0		21-159	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	86.0		17-205	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	78.0		28-136	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	73.0		21-158	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	82.0		20-186	%	21-JAN-20	23-JAN-20	R4976949
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	96.0		31-191	%	21-JAN-20	23-JAN-20	R4976949
Lower Bound PCDD/F TEQ (WHO 2005)	0.0675			pg/L	21-JAN-20	23-JAN-20	R4976949
Mid Point PCDD/F TEQ (WHO 2005)	0.561			pg/L	21-JAN-20	23-JAN-20	R4976949
Upper Bound PCDD/F TEQ (WHO 2005)	1.05			pg/L	21-JAN-20	23-JAN-20	R4976949
VOC plus F1 to F4							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	09-JAN-20	09-JAN-20	R4965831
F3 (C16-C34)	<0.25		0.25	mg/L	09-JAN-20	09-JAN-20	R4965831
F4 (C34-C50)	<0.25		0.25	mg/L	09-JAN-20	09-JAN-20	R4965831
Surrogate: 2-Bromobenzotrifluoride	105.1		60-140	%	09-JAN-20	09-JAN-20	R4965831
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		16-JAN-20	
F2-Naphth	<0.10		0.10	mg/L		16-JAN-20	
F3-PAH	<0.25		0.25	mg/L		16-JAN-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		16-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JAN-20	
Total Trihalomethanes (THMs)							
Total THMs	<0.0013		0.0013	mg/L		16-JAN-20	
VOC plus F1 by GCMS							
Acetone	<0.050		0.050	mg/L		13-JAN-20	R4971648
Benzene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Bromobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Bromochloromethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Bromodichloromethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Bromoform	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Bromomethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
n-Butylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
sec-Butylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
tert-Butylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Carbon disulfide	<0.0050		0.0050	mg/L		13-JAN-20	R4971648
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Chlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Chloroethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Chloroform	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Chloromethane	<0.0050		0.0050	mg/L		13-JAN-20	R4971648

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-2 WELL SHOP (TAP SOP ON BOTTLES)							
Sampled By: CLIENT on 08-JAN-20 @ 14:30							
Matrix: GW							
VOC plus F1 by GCMS							
2-Chlorotoluene	<0.020		0.020	mg/L		13-JAN-20	R4971648
4-Chlorotoluene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dibromochloromethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,2-Dibromo-3-chloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2-Dibromoethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dibromomethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,3-Dichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,4-Dichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
cis-1,2-Dichloroethene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
trans-1,2-Dichloroethene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Dichloromethane	<0.0050		0.0050	mg/L		13-JAN-20	R4971648
1,2-Dichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,3-Dichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
2,2-Dichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1-Dichloropropene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
cis-1,3-Dichloropropene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
trans-1,3-Dichloropropene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Ethylbenzene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
F1	<0.10		0.10	mg/L		13-JAN-20	R4971648
Hexachlorobutadiene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Hexane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-JAN-20	R4971648
Isopropylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
MEK	<0.020		0.020	mg/L		13-JAN-20	R4971648
MIBK	<0.020		0.020	mg/L		13-JAN-20	R4971648
MTBE	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Styrene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Tetrachloroethene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Toluene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,2,3-Trichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2,4-Trichlorobenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Trichloroethene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2,3-Trichloropropane	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,2,4-Trimethylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
1,3,5-Trimethylbenzene	<0.0010		0.0010	mg/L		13-JAN-20	R4971648
Vinyl Chloride	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
M+P-Xylenes	<0.00040		0.00040	mg/L		13-JAN-20	R4971648
o-Xylene	<0.00050		0.00050	mg/L		13-JAN-20	R4971648
Surrogate: 4-Bromofluorobenzene (SS)	86.6		70-130	%		13-JAN-20	R4971648
Surrogate: 1,4-Difluorobenzene (SS)	103.3		70-130	%		13-JAN-20	R4971648

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2403662-2 WELL SHOP (TAP SOP ON BOTTLES) Sampled By: CLIENT on 08-JAN-20 @ 14:30 Matrix: GW							
VOC plus F1 by GCMS							
Surrogate: 3,4-Dichlorotoluene (SS)	77.5		70-130	%		13-JAN-20	R4971648

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,B	A peak has been manually integrated. Target analyte was detected below the calibrated range but above the EDL. Compound was detected in the method blank at >10% of the sample concentration.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DX-1613B-HRMS-BU	Water	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are filtered if required. Solids are extracted by Soxhlet using toluene. The liquid portion is extracted by liquid/liquid extraction using dichloromethane. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

EOX-MP	Misc.	Extractable Organic Halides (EOX)	SEE SUBLET LAB REPORT

The material is extracted with ethyl acetate then the extract is analyzed on the TOX (Total Organic Halides) instrument.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

HG-T-CVAA-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA 3511/8270D (mod)

PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

THM-SUM-CALC-WP	Water	Total Trihalomethanes (THMs)	CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A
In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
MP	ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: Wood Environment & Infrastructure Solutions (Winnipeg)
440 Dovercourt Drive
Winnipeg MB R3Y 1G4
Contact: KEVIN BEECHINOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DX-1613B-HRMS-BU	**Water**							
Batch R4976949								
WG3256723-2 LCS								
2,3,7,8-TCDD			108.0		%		67-158	23-JAN-20
1,2,3,7,8-PeCDD			104.0		%		70-142	23-JAN-20
1,2,3,4,7,8-HxCDD			100.0		%		70-164	23-JAN-20
1,2,3,6,7,8-HxCDD			98.0		%		76-134	23-JAN-20
1,2,3,7,8,9-HxCDD			99.0		%		64-162	23-JAN-20
1,2,3,4,6,7,8-HpCDD			102.0		%		70-140	23-JAN-20
OCDD			95.0		%		78-144	23-JAN-20
2,3,7,8-TCDF			97.0		%		75-158	23-JAN-20
1,2,3,7,8-PeCDF			101.0		%		80-134	23-JAN-20
2,3,4,7,8-PeCDF			97.0		%		68-160	23-JAN-20
1,2,3,4,7,8-HxCDF			97.0		%		72-134	23-JAN-20
1,2,3,6,7,8-HxCDF			101.0		%		84-130	23-JAN-20
2,3,4,6,7,8-HxCDF			99.0		%		70-156	23-JAN-20
1,2,3,7,8,9-HxCDF			104.0		%		78-130	23-JAN-20
1,2,3,4,6,7,8-HpCDF			108.0		%		82-122	23-JAN-20
1,2,3,4,7,8,9-HpCDF			89.0		%		78-138	23-JAN-20
OCDF			112.0		%		63-170	23-JAN-20
WG3256723-1 MB								
2,3,7,8-TCDD			<0.37	[U]	pg/L		0.37	23-JAN-20
1,2,3,7,8-PeCDD			<0.25	[U]	pg/L		0.25	23-JAN-20
1,2,3,4,7,8-HxCDD			<0.31	[U]	pg/L		0.31	23-JAN-20
1,2,3,6,7,8-HxCDD			<0.32	[U]	pg/L		0.32	23-JAN-20
1,2,3,7,8,9-HxCDD			0.41	M,J	pg/L		0.31	23-JAN-20
1,2,3,4,6,7,8-HpCDD			0.92	M,J,R	pg/L		0.48	23-JAN-20
OCDD			3.65	M,J	pg/L		0.69	23-JAN-20
2,3,7,8-TCDF			<0.34	[U]	pg/L		0.34	23-JAN-20
1,2,3,7,8-PeCDF			0.45	M,J,R	pg/L		0.25	23-JAN-20
2,3,4,7,8-PeCDF			0.32	M,J	pg/L		0.23	23-JAN-20
1,2,3,4,7,8-HxCDF			<0.27	[U]	pg/L		0.27	23-JAN-20
1,2,3,6,7,8-HxCDF			<0.28	[U]	pg/L		0.28	23-JAN-20
2,3,4,6,7,8-HxCDF			<0.30	[U]	pg/L		0.3	23-JAN-20
1,2,3,7,8,9-HxCDF			0.53	M,J	pg/L		0.38	23-JAN-20
1,2,3,4,6,7,8-HpCDF			<0.35	[U]	pg/L		0.35	23-JAN-20
1,2,3,4,7,8,9-HpCDF			<0.41	[U]	pg/L		0.41	23-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DX-1613B-HRMS-BU	**Water**							
Batch R4976949								
WG3256723-1 MB								
OCDF			0.95	M,J,R	pg/L		0.73	23-JAN-20
Total-TCDD			<0.37	[U]	pg/L		0.37	23-JAN-20
Total-PeCDD			<0.25	[U]	pg/L		0.25	23-JAN-20
Total-HxCDD			0.41	A	pg/L		0.32	23-JAN-20
Total-HpCDD			<0.48	[U]	pg/L		0.48	23-JAN-20
Total-TCDF			<0.34	[U]	pg/L		0.34	23-JAN-20
Total-PeCDF			0.32	A	pg/L		0.25	23-JAN-20
Total-HxCDF			0.53	A	pg/L		0.38	23-JAN-20
Total-HpCDF			<0.41	[U]	pg/L		0.41	23-JAN-20
Surrogate: 13C12-2,3,7,8-TCDD			88.0		%		20-175	23-JAN-20
Surrogate: 13C12-1,2,3,7,8-PeCDD			80.0		%		21-227	23-JAN-20
Surrogate: 13C12-1,2,3,4,7,8-HxCDD			84.0		%		21-193	23-JAN-20
Surrogate: 13C12-1,2,3,6,7,8-HxCDD			84.0		%		25-163	23-JAN-20
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD			74.0		%		23-166	23-JAN-20
Surrogate: 13C12-OCDD			41.0		%		13-138	23-JAN-20
Surrogate: 13C12-2,3,7,8-TCDF			86.0		%		22-152	23-JAN-20
Surrogate: 13C12-1,2,3,7,8-PeCDF			83.0		%		24-185	23-JAN-20
Surrogate: 13C12-2,3,4,7,8-PeCDF			77.0		%		21-178	23-JAN-20
Surrogate: 13C12-1,2,3,4,7,8-HxCDF			82.0		%		26-152	23-JAN-20
Surrogate: 13C12-1,2,3,6,7,8-HxCDF			83.0		%		21-159	23-JAN-20
Surrogate: 13C12-2,3,4,6,7,8-HxCDF			81.0		%		17-205	23-JAN-20
Surrogate: 13C12-1,2,3,7,8,9-HxCDF			76.0		%		28-136	23-JAN-20
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF			67.0		%		21-158	23-JAN-20
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF			77.0		%		20-186	23-JAN-20
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)			97.0		%		31-191	23-JAN-20
COMMENTS: Blank has low levels of select targets that are within the reference method control limits								
F2-F4-FID-WP	**Water**							
Batch R4965831								
WG3254398-2 LCS								
F2 (C10-C16)			98.4		%		70-130	08-JAN-20
F3 (C16-C34)			95.9		%		70-130	08-JAN-20
F4 (C34-C50)			102.7		%		70-130	08-JAN-20
WG3254398-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	08-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-FID-WP	**Water**							
Batch R4965831								
WG3254398-1 MB								
F3 (C16-C34)			<0.25		mg/L		0.25	08-JAN-20
F4 (C34-C50)			<0.25		mg/L		0.25	08-JAN-20
Surrogate: 2-Bromobenzotrifluoride			104.6		%		60-140	08-JAN-20
HG-T-CVAA-WP	**Water**							
Batch R4969808								
WG3258095-2 LCS								
Mercury (Hg)-Total			96.0		%		80-120	14-JAN-20
WG3258095-1 MB								
Mercury (Hg)-Total			<0.000005		mg/L		0.000005	14-JAN-20
MET-T-CCMS-WP	**Water**							
Batch R4987627								
WG3267161-2 LCS								
Aluminum (Al)-Total			111.7		%		80-120	03-FEB-20
Antimony (Sb)-Total			109.0		%		80-120	03-FEB-20
Arsenic (As)-Total			109.9		%		80-120	03-FEB-20
Barium (Ba)-Total			109.8		%		80-120	03-FEB-20
Beryllium (Be)-Total			102.4		%		80-120	03-FEB-20
Bismuth (Bi)-Total			107.7		%		80-120	03-FEB-20
Boron (B)-Total			112.5		%		80-120	03-FEB-20
Cadmium (Cd)-Total			108.3		%		80-120	03-FEB-20
Calcium (Ca)-Total			105.8		%		80-120	03-FEB-20
Cesium (Cs)-Total			107.9		%		80-120	03-FEB-20
Chromium (Cr)-Total			110.4		%		80-120	03-FEB-20
Cobalt (Co)-Total			109.2		%		80-120	03-FEB-20
Copper (Cu)-Total			109.0		%		80-120	03-FEB-20
Iron (Fe)-Total			98.1		%		80-120	03-FEB-20
Lead (Pb)-Total			105.4		%		80-120	03-FEB-20
Lithium (Li)-Total			104.6		%		80-120	03-FEB-20
Magnesium (Mg)-Total			118.1		%		80-120	03-FEB-20
Manganese (Mn)-Total			110.0		%		80-120	03-FEB-20
Molybdenum (Mo)-Total			106.4		%		80-120	03-FEB-20
Nickel (Ni)-Total			107.2		%		80-120	03-FEB-20
Potassium (K)-Total			100.9		%		80-120	03-FEB-20
Phosphorus (P)-Total			110.8		%		80-120	03-FEB-20
Rubidium (Rb)-Total			110.8		%		80-120	03-FEB-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4987627								
WG3267161-2 LCS								
Selenium (Se)-Total			106.8		%		80-120	03-FEB-20
Silicon (Si)-Total			104.5		%		80-120	03-FEB-20
Silver (Ag)-Total			108.8		%		80-120	03-FEB-20
Sodium (Na)-Total			110.6		%		80-120	03-FEB-20
Strontium (Sr)-Total			110.0		%		80-120	03-FEB-20
Sulfur (S)-Total			97.8		%		80-120	03-FEB-20
Tellurium (Te)-Total			99.1		%		80-120	03-FEB-20
Thallium (Tl)-Total			102.7		%		80-120	03-FEB-20
Thorium (Th)-Total			103.9		%		80-120	03-FEB-20
Tin (Sn)-Total			106.3		%		80-120	03-FEB-20
Titanium (Ti)-Total			106.8		%		80-120	03-FEB-20
Tungsten (W)-Total			104.4		%		80-120	03-FEB-20
Uranium (U)-Total			110.4		%		80-120	03-FEB-20
Vanadium (V)-Total			109.5		%		80-120	03-FEB-20
Zinc (Zn)-Total			109.2		%		80-120	03-FEB-20
Zirconium (Zr)-Total			103.0		%		80-120	03-FEB-20
WG3267161-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	03-FEB-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	03-FEB-20
Boron (B)-Total			<0.010		mg/L		0.01	03-FEB-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	03-FEB-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-FEB-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	03-FEB-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	03-FEB-20
Iron (Fe)-Total			<0.010		mg/L		0.01	03-FEB-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-FEB-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	03-FEB-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-FEB-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4987627								
WG3267161-1 MB								
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	03-FEB-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-FEB-20
Potassium (K)-Total			<0.050		mg/L		0.05	03-FEB-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	03-FEB-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	03-FEB-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	03-FEB-20
Silicon (Si)-Total			<0.10		mg/L		0.1	03-FEB-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	03-FEB-20
Sodium (Na)-Total			<0.050		mg/L		0.05	03-FEB-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	03-FEB-20
Sulfur (S)-Total			<0.50		mg/L		0.5	03-FEB-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	03-FEB-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	03-FEB-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	03-FEB-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	03-FEB-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	03-FEB-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	03-FEB-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-FEB-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	03-FEB-20
PAH,PANH-WP	**Water**							
Batch R4964572								
WG3256843-2 LCS								
1-Methyl Naphthalene			120.6		%		60-130	13-JAN-20
2-Methyl Naphthalene			119.5		%		60-130	13-JAN-20
Acenaphthene			116.2		%		60-130	13-JAN-20
Acenaphthylene			113.8		%		60-130	13-JAN-20
Anthracene			90.8		%		60-130	13-JAN-20
Acridine			103.1		%		60-130	13-JAN-20
Benzo(a)anthracene			92.3		%		60-130	13-JAN-20
Benzo(a)pyrene			104.5		%		60-130	13-JAN-20
Benzo(b&j)fluoranthene			106.1		%		60-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R4964572								
WG3256843-2 LCS								
Benzo(g,h,i)perylene			120.7		%		60-130	13-JAN-20
Benzo(k)fluoranthene			118.0		%		60-130	13-JAN-20
Chrysene			92.1		%		60-130	13-JAN-20
Dibenzo(a,h)anthracene			118.2		%		60-130	13-JAN-20
Fluoranthene			117.6		%		60-130	13-JAN-20
Fluorene			110.0		%		60-130	13-JAN-20
Indeno(1,2,3-cd)pyrene			97.1		%		60-130	13-JAN-20
Naphthalene			120.0		%		50-130	13-JAN-20
Phenanthrene			109.7		%		60-130	13-JAN-20
Pyrene			120.9		%		60-130	13-JAN-20
Quinoline			119.0		%		60-130	13-JAN-20
WG3256843-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	13-JAN-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	13-JAN-20
Acenaphthene			<0.000020		mg/L		0.00002	13-JAN-20
Acenaphthylene			<0.000020		mg/L		0.00002	13-JAN-20
Anthracene			<0.000010		mg/L		0.00001	13-JAN-20
Acridine			<0.000020		mg/L		0.00002	13-JAN-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	13-JAN-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	13-JAN-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	13-JAN-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	13-JAN-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	13-JAN-20
Chrysene			<0.000020		mg/L		0.00002	13-JAN-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	13-JAN-20
Fluoranthene			<0.000020		mg/L		0.00002	13-JAN-20
Fluorene			<0.000020		mg/L		0.00002	13-JAN-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	13-JAN-20
Naphthalene			<0.000050		mg/L		0.00005	13-JAN-20
Phenanthrene			<0.000050		mg/L		0.00005	13-JAN-20
Pyrene			<0.000010		mg/L		0.00001	13-JAN-20
Quinoline			<0.000020		mg/L		0.00002	13-JAN-20
Surrogate: Acenaphthene d10			99.1		%		60-130	13-JAN-20
Surrogate: Acridine d9			91.9		%		60-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R4964572								
WG3256843-1 MB								
Surrogate: Chrysene d12			111.2		%		60-130	13-JAN-20
Surrogate: Naphthalene d8			97.4		%		50-130	13-JAN-20
Surrogate: Phenanthrene d10			99.8		%		60-130	13-JAN-20
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-4 DUP		**L2403662-2**						
Acetone		<0.050	<0.050	RPD-NA	mg/L	N/A	30	13-JAN-20
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Bromobenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Bromochloromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Bromodichloromethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Bromoform		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Bromomethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-JAN-20
n-Butylbenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
sec-Butylbenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
tert-Butylbenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Carbon disulfide		<0.0050	<0.0050	RPD-NA	mg/L	N/A	30	13-JAN-20
Carbon Tetrachloride		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Chlorobenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Chloroethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-JAN-20
Chloroform		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Chloromethane		<0.0050	<0.0050	RPD-NA	mg/L	N/A	50	13-JAN-20
2-Chlorotoluene		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-JAN-20
4-Chlorotoluene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Dibromochloromethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2-Dibromo-3-chloropropane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2-Dibromoethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Dibromomethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2-Dichlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,3-Dichlorobenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,4-Dichlorobenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Dichlorodifluoromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-JAN-20
1,1-dichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2-Dichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-4 DUP		**L2403662-2**						
1,1-dichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
cis-1,2-Dichloroethene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
trans-1,2-Dichloroethene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Dichloromethane		<0.0050	<0.0050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2-Dichloropropane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,3-Dichloropropane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
2,2-Dichloropropane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,1-Dichloropropene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
cis-1,3-Dichloropropene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
trans-1,3-Dichloropropene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Ethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
F1		<0.10	<0.10	RPD-NA	mg/L	N/A	30	13-JAN-20
Hexachlorobutadiene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
Hexane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
2-Hexanone (Methyl butyl ketone)		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-JAN-20
Isopropylbenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
4-Isopropyltoluene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
MEK		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-JAN-20
MIBK		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-JAN-20
MTBE		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Styrene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,1,1,2-Tetrachloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,1,2,2-Tetrachloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Tetrachloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2,3-Trichlorobenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2,4-Trichlorobenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,1,1-Trichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
1,1,2-Trichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Trichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
Trichlorofluoromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-JAN-20
1,2,3-Trichloropropane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,2,4-Trimethylbenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20
1,3,5-Trimethylbenzene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-4 DUP		**L2403662-2**						
Vinyl Chloride		<0.00050	<0.00050	RPD-NA	mg/L	N/A	50	13-JAN-20
M+P-Xylenes		<0.00040	<0.00040	RPD-NA	mg/L	N/A	30	13-JAN-20
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-JAN-20
WG3257141-2 LCS								
Acetone			86.7		%		70-130	13-JAN-20
Benzene			85.7		%		70-130	13-JAN-20
Bromobenzene			86.4		%		70-130	13-JAN-20
Bromochloromethane			78.0		%		70-130	13-JAN-20
Bromodichloromethane			77.6		%		70-130	13-JAN-20
Bromoform			79.3		%		70-130	13-JAN-20
Bromomethane			99.9		%		60-140	13-JAN-20
n-Butylbenzene			111.1		%		70-130	13-JAN-20
sec-Butylbenzene			113.8		%		70-130	13-JAN-20
tert-Butylbenzene			118.7		%		70-130	13-JAN-20
Carbon disulfide			110.6		%		70-130	13-JAN-20
Carbon Tetrachloride			99.1		%		70-130	13-JAN-20
Chlorobenzene			87.0		%		70-130	13-JAN-20
Chloroethane			93.3		%		60-140	13-JAN-20
Chloroform			84.1		%		70-130	13-JAN-20
Chloromethane			124.7		%		60-140	13-JAN-20
2-Chlorotoluene			110.5		%		70-130	13-JAN-20
4-Chlorotoluene			104.4		%		70-130	13-JAN-20
Dibromochloromethane			77.2		%		70-130	13-JAN-20
1,2-Dibromo-3-chloropropane			72.3		%		70-130	13-JAN-20
1,2-Dibromoethane			71.2		%		70-130	13-JAN-20
Dibromomethane			75.1		%		70-130	13-JAN-20
1,2-Dichlorobenzene			84.5		%		70-130	13-JAN-20
1,3-Dichlorobenzene			92.3		%		70-130	13-JAN-20
1,4-Dichlorobenzene			95.7		%		70-130	13-JAN-20
Dichlorodifluoromethane			127.9		%		60-140	13-JAN-20
1,1-dichloroethane			85.7		%		70-130	13-JAN-20
1,2-Dichloroethane			72.9		%		70-130	13-JAN-20
1,1-dichloroethene			100.3		%		70-130	13-JAN-20
cis-1,2-Dichloroethene			84.6		%		70-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-2 LCS								
trans-1,2-Dichloroethene			95.3		%		70-130	13-JAN-20
Dichloromethane			81.6		%		70-130	13-JAN-20
1,2-Dichloropropane			73.4		%		70-130	13-JAN-20
1,3-Dichloropropane			72.5		%		70-130	13-JAN-20
2,2-Dichloropropane			91.8		%		70-130	13-JAN-20
1,1-Dichloropropene			100.2		%		70-130	13-JAN-20
cis-1,3-Dichloropropene			85.0		%		70-130	13-JAN-20
trans-1,3-Dichloropropene			86.0		%		70-130	13-JAN-20
Ethylbenzene			97.4		%		70-130	13-JAN-20
Hexachlorobutadiene			99.1		%		70-130	13-JAN-20
Hexane			88.6		%		70-130	13-JAN-20
2-Hexanone (Methyl butyl ketone)			72.2		%		70-130	13-JAN-20
Isopropylbenzene			108.1		%		70-130	13-JAN-20
4-Isopropyltoluene			121.8		%		70-130	13-JAN-20
MEK			73.6		%		70-130	13-JAN-20
MIBK			73.3		%		70-130	13-JAN-20
MTBE			87.2		%		70-130	13-JAN-20
Styrene			89.2		%		70-130	13-JAN-20
1,1,1,2-Tetrachloroethane			80.0		%		70-130	13-JAN-20
1,1,2,2-Tetrachloroethane			82.0		%		70-130	13-JAN-20
Tetrachloroethene			99.7		%		70-130	13-JAN-20
Toluene			91.8		%		70-130	13-JAN-20
1,2,3-Trichlorobenzene			79.6		%		70-130	13-JAN-20
1,2,4-Trichlorobenzene			78.3		%		70-130	13-JAN-20
1,1,1-Trichloroethane			98.3		%		70-130	13-JAN-20
1,1,2-Trichloroethane			73.6		%		70-130	13-JAN-20
Trichloroethene			93.5		%		70-130	13-JAN-20
Trichlorofluoromethane			127.1		%		60-140	13-JAN-20
1,2,3-Trichloropropane			73.3		%		70-130	13-JAN-20
1,2,4-Trimethylbenzene			104.5		%		70-130	13-JAN-20
1,3,5-Trimethylbenzene			107.4		%		70-130	13-JAN-20
Vinyl Chloride			120.6		%		60-140	13-JAN-20
M+P-Xylenes			105.5		%		70-130	13-JAN-20
o-Xylene			92.8		%		70-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-3 LCS								
F1			108.0		%		70-130	13-JAN-20
WG3257141-1 MB								
Acetone			<0.050		mg/L		0.05	13-JAN-20
Benzene			<0.00050		mg/L		0.0005	13-JAN-20
Bromobenzene			<0.0010		mg/L		0.001	13-JAN-20
Bromochloromethane			<0.0010		mg/L		0.001	13-JAN-20
Bromodichloromethane			<0.00050		mg/L		0.0005	13-JAN-20
Bromoform			<0.0010		mg/L		0.001	13-JAN-20
Bromomethane			<0.0010		mg/L		0.001	13-JAN-20
n-Butylbenzene			<0.0010		mg/L		0.001	13-JAN-20
sec-Butylbenzene			<0.0010		mg/L		0.001	13-JAN-20
tert-Butylbenzene			<0.0010		mg/L		0.001	13-JAN-20
Carbon disulfide			<0.0050		mg/L		0.005	13-JAN-20
Carbon Tetrachloride			<0.00050		mg/L		0.0005	13-JAN-20
Chlorobenzene			<0.0010		mg/L		0.001	13-JAN-20
Chloroethane			<0.0010		mg/L		0.001	13-JAN-20
Chloroform			<0.00050		mg/L		0.0005	13-JAN-20
Chloromethane			<0.0050		mg/L		0.005	13-JAN-20
2-Chlorotoluene			<0.020		mg/L		0.02	13-JAN-20
4-Chlorotoluene			<0.0010		mg/L		0.001	13-JAN-20
Dibromochloromethane			<0.00050		mg/L		0.0005	13-JAN-20
1,2-Dibromo-3-chloropropane			<0.0010		mg/L		0.001	13-JAN-20
1,2-Dibromoethane			<0.0010		mg/L		0.001	13-JAN-20
Dibromomethane			<0.0010		mg/L		0.001	13-JAN-20
1,2-Dichlorobenzene			<0.00050		mg/L		0.0005	13-JAN-20
1,3-Dichlorobenzene			<0.0010		mg/L		0.001	13-JAN-20
1,4-Dichlorobenzene			<0.0010		mg/L		0.001	13-JAN-20
Dichlorodifluoromethane			<0.0010		mg/L		0.001	13-JAN-20
1,1-dichloroethane			<0.00050		mg/L		0.0005	13-JAN-20
1,2-Dichloroethane			<0.00050		mg/L		0.0005	13-JAN-20
1,1-dichloroethene			<0.00050		mg/L		0.0005	13-JAN-20
cis-1,2-Dichloroethene			<0.0010		mg/L		0.001	13-JAN-20
trans-1,2-Dichloroethene			<0.0010		mg/L		0.001	13-JAN-20
Dichloromethane			<0.0050		mg/L		0.005	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-1 MB								
1,2-Dichloropropane			<0.0010		mg/L		0.001	13-JAN-20
1,3-Dichloropropane			<0.0010		mg/L		0.001	13-JAN-20
2,2-Dichloropropane			<0.0010		mg/L		0.001	13-JAN-20
1,1-Dichloropropene			<0.0010		mg/L		0.001	13-JAN-20
cis-1,3-Dichloropropene			<0.0010		mg/L		0.001	13-JAN-20
trans-1,3-Dichloropropene			<0.0010		mg/L		0.001	13-JAN-20
Ethylbenzene			<0.00050		mg/L		0.0005	13-JAN-20
F1			<0.10		mg/L		0.1	13-JAN-20
Hexachlorobutadiene			<0.0010		mg/L		0.001	13-JAN-20
Hexane			<0.0010		mg/L		0.001	13-JAN-20
2-Hexanone (Methyl butyl ketone)			<0.020		mg/L		0.02	13-JAN-20
Isopropylbenzene			<0.0010		mg/L		0.001	13-JAN-20
4-Isopropyltoluene			<0.0010		mg/L		0.001	13-JAN-20
MEK			<0.020		mg/L		0.02	13-JAN-20
MIBK			<0.020		mg/L		0.02	13-JAN-20
MTBE			<0.00050		mg/L		0.0005	13-JAN-20
Styrene			<0.0010		mg/L		0.001	13-JAN-20
1,1,1,2-Tetrachloroethane			<0.00050		mg/L		0.0005	13-JAN-20
1,1,2,2-Tetrachloroethane			<0.00050		mg/L		0.0005	13-JAN-20
Tetrachloroethene			<0.00050		mg/L		0.0005	13-JAN-20
Toluene			<0.00050		mg/L		0.0005	13-JAN-20
1,2,3-Trichlorobenzene			<0.0010		mg/L		0.001	13-JAN-20
1,2,4-Trichlorobenzene			<0.0010		mg/L		0.001	13-JAN-20
1,1,1-Trichloroethane			<0.00050		mg/L		0.0005	13-JAN-20
1,1,2-Trichloroethane			<0.00050		mg/L		0.0005	13-JAN-20
Trichloroethene			<0.00050		mg/L		0.0005	13-JAN-20
Trichlorofluoromethane			<0.0010		mg/L		0.001	13-JAN-20
1,2,3-Trichloropropane			<0.0010		mg/L		0.001	13-JAN-20
1,2,4-Trimethylbenzene			<0.0010		mg/L		0.001	13-JAN-20
1,3,5-Trimethylbenzene			<0.0010		mg/L		0.001	13-JAN-20
Vinyl Chloride			<0.00050		mg/L		0.0005	13-JAN-20
M+P-Xylenes			<0.00040		mg/L		0.0004	13-JAN-20
o-Xylene			<0.00050		mg/L		0.0005	13-JAN-20
Surrogate: 4-Bromofluorobenzene (SS)			88.9		%		70-130	13-JAN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4971648								
WG3257141-1 MB								
Surrogate: 1,4-Difluorobenzene (SS)			101.7		%		70-130	13-JAN-20
Surrogate: 3,4-Dichlorotoluene (SS)			75.4		%		70-130	13-JAN-20

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
[U]	The analyte was not detected above the EDL.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

January 17, 2020

Ms. Judy Dalmaijer
ALS Environmental-Winnipeg MB
Unit 12–1329 Niakwa Road East
Winnipeg, MB, R2J 3T4

Certificate of Analysis

Project Name:	**TOX**	Workorder:	**3079979**
Purchase Order:	**L2403662**	Workorder ID:	**L2403662**

Dear Ms. Dalmaijer:

Enclosed are the analytical results for samples received by the laboratory on Friday, January 10, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Sarah S Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Bea Ryback , Mr. Craig Riddell

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3079979 L2403662

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3079979001	L2403662-1	Water	1/8/2020 00:00	1/10/2020 10:19	Collected by Client
3079979002	L2403662-2	Water	1/8/2020 00:00	1/10/2020 10:19	Collected by Client

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SAMPLE SUMMARY

Workorder: 3079979 L2403662

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3079979 L2403662

Lab ID: **3079979001** Date Collected: 1/8/2020 00:00 Matrix: Water

Sample ID: **L2403662-1** Date Received: 1/10/2020 10:19

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND	Y,Y	ug/L	20.0	SW846 9020B			1/15/20 12:56	PAG	A

Ms. Sarah S Leung
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3079979 L2403662

Lab ID: **3079979002** Date Collected: 1/8/2020 00:00 Matrix: Water

Sample ID: **L2403662-2** Date Received: 1/10/2020 10:19

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY										
Halogen, Total Organic (TOX)	ND	Y,Y	ug/L	20.0	SW846 9020B			1/15/20 14:15	PAG	A

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3079979 L2403662

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3079979001	Y	L2403662-1	SW846 9020B	Halogen, Total Organic (TOX)
The laboratory analysis was from as unpreserved or improperly preserved sample.				
3079979002	Y	L2403662-2	SW846 9020B	Halogen, Total Organic (TOX)
The laboratory analysis was from as unpreserved or improperly preserved sample.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3079979 L2403662

Lab ID	Sample ID	Analysis Method	Prep Method
3079979001	L2403662-1	SW846 9020B	
3079979002	L2403662-2	SW846 9020B	

QUALITY CONTROL DATA

Workorder: 3079979 L2403662

QC Batch: WETC/233170 **Analysis Method:** SW846 9020B

QC Batch Method: SW846 9020B

Associated Lab Samples: 3079979001, 3079979002

METHOD BLANK: 3073590

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	ug/L	10.0

LABORATORY CONTROL SAMPLE: 3073591

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	103	ug/L	100	103	80 - 120

LABORATORY CONTROL SAMPLE: 3073592

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Halogen, Total Organic (TOX)	102	ug/L	100	102	80 - 120

MATRIX SPIKE SAMPLE: 3073884 ORIGINAL: 3079765001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
Halogen, Total Organic (TOX)	0	ug/L	200	212.04	106	80 - 120

METHOD BLANK: 3073594

Parameter	Blank Result	Units	Reporting Limit
Halogen, Total Organic (TOX)	ND	ug/L	10.0

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3079979 L2403662

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3079979001	L2403662-1			SW846 9020B	WETC/233170
3079979002	L2403662-2			SW846 9020B	WETC/233170

3079979

L2403662

WINNIPEG

ALS Environmental

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
34 DOGWOOD LANE
MIDDLETOWN,PENNSYLVANIA 17057

NOTES: Please reference on final report and invoice: PO# *L2403662*
ALS requires QC data to be provided with your final results.

Please see enclosed 2 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L2403662-1 TH19-01	Extractable Organic Halides (EOX) (EOX-MP 14)	**1/8/2020** 1/31/2020	2 x A 250mL
L2403662-2 WELL SHOP (TAP SOP ON BOTTLES)	Extractable Organic Halides (EOX) (EOX-MP 14)	**1/8/2020** 1/31/2020	2 x A250mL

Subcontract Info Contact: Judy Dalmaijer (204) 255-9749
Analysis and reporting info contact: Judy Dalmaijer
12-1329 NIAKWA ROAD E
WINNIPEG,MB R2J3T4
Phone: (204) 255-9749 Email:Judy.Dalmaijer@alsglobal.com

CLS 1/10/20

Please email confirmation of receipt to: **Judy.Dalmaijer@alsglobal.com**

Shipped By: BB Date Shipped: JAN 9

Received By: UPS Date Received:

Verified By: Date Verified: 1/10/20 10:19

Temperature: 11°

Sample Integrity Issues:

Wednesday, January 08, 2020 4:07 PM

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: ALS Winnipeg | Work Order #: 3079979 | Initials: CS | Date: 1/10

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 12 6662 7245 66 6727 3050			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples? (No times client not noted: fixed by CS not noted)		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: _____

Temperature (°C): 5

Thermometer ID: 318

Radiological (µCi): _____

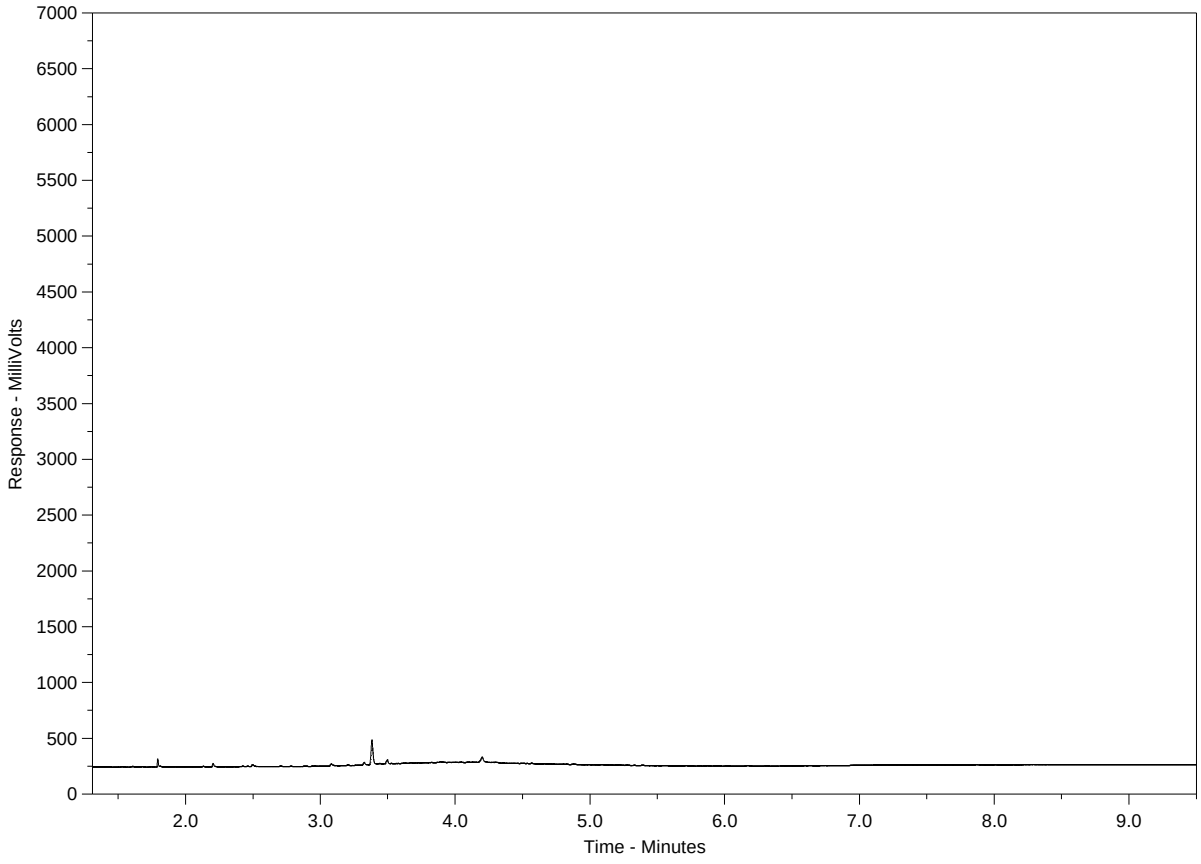
COMMENTS (Required for all NO responses above and any sample non-conformance):

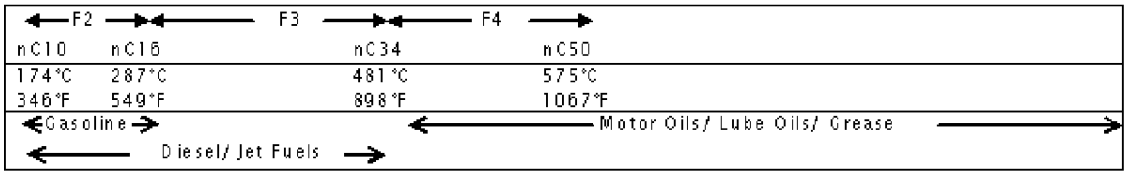
Bottles rec'd unp. will need sulfuric added.

Rev. 4/29/2019

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403662-1
Client Sample ID: TH19-01





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

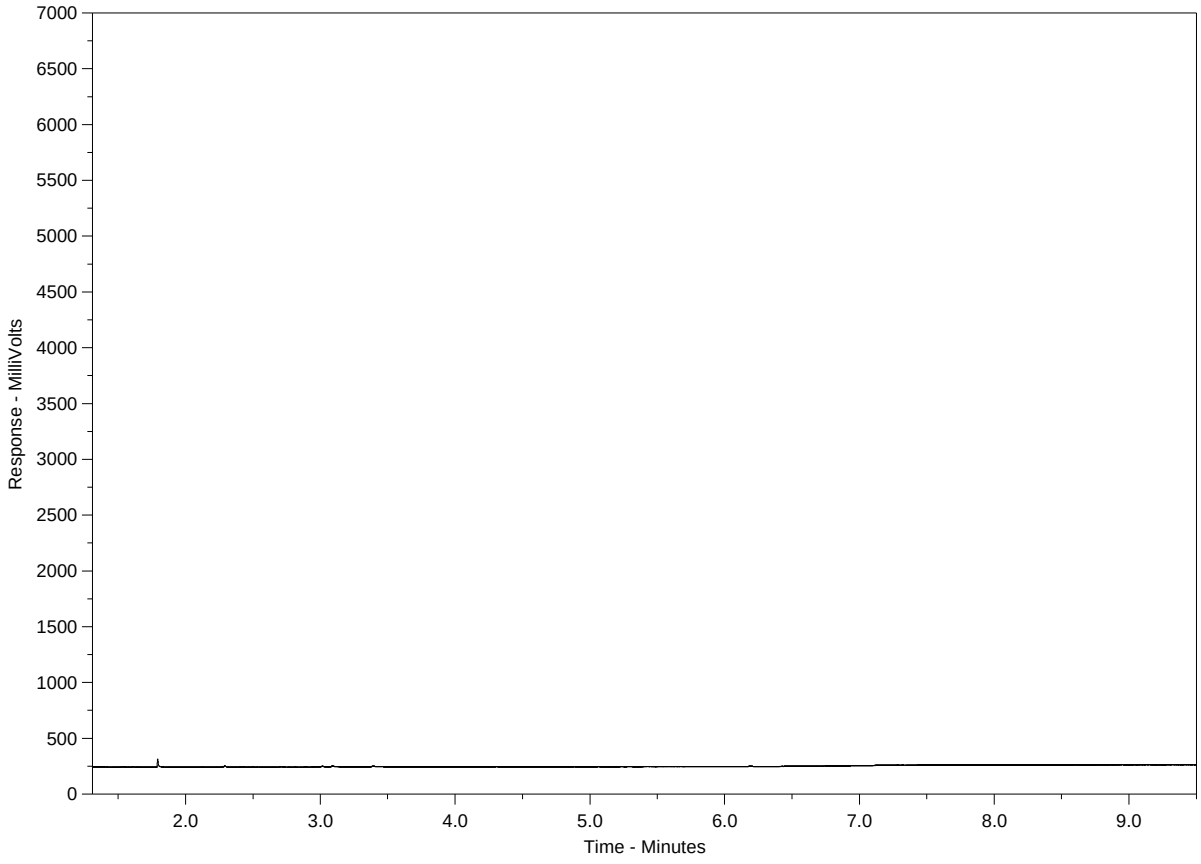
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

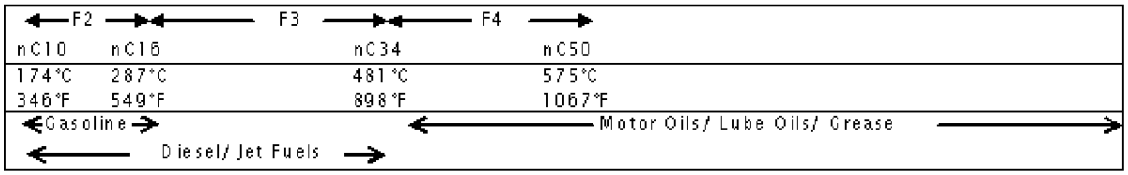
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2403662-2
Client Sample ID: WELL SHOP (TAP SOP ON BOTTLES)





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The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2403662-COFC

COC Number: 17 - 782776

Page 1 of 1

L2403662

Report To	Contact and company name below will appear on the final report	Report Format / Distribution
Company:	Wood	Select Report Format: PDF EXCEL EDD (DIGITAL)
Contact:	Kevin Beechinor	Quality Control (QC) Report with Report YES NO
Phone:		Compare Results to Criteria on Report - provide details below if box checked
	Company address below will appear on the final report	Select Distribution: EMAIL MAIL FAX
Street:	440 Dovercourt	Email 1 or Fax Kevin.beechinor@woodplc.com
City/Province:	Wpg, MB	Email 2 angela.cerilli@woodplc.com
Postal Code:		Email 3 justin.huberdeau@woodplc.com
Invoice To	Same as Report To YES NO	**Invoice Distribution**
	Copy of Invoice with Report YES NO	Select Invoice Distribution: EMAIL MAIL FAX
Company:		Email 1 or Fax
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:	WX18979	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200%] ☐ (Laboratory opening fees may apply) ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Dioxans + Furans	EDX / Tot. Org. Halides	Mercury (BC)	Metals (BC; Tot.)	PAHs	VOC/BTEX, F1-F4	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	TH19-01	08 Jan 20	13:30	GW		X	X	X	X	X	X		
	Well-Shop *	08 Jan 20	14:30	GW		X	X	X	X	X	X		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? YES NO	* labelled as Tap-Shop on containers → TH19-01 - limited sample size for Dioxans + Furans *
Are samples for human consumption/ use? YES NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
1.2							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
A. Cerilli	08 Jan 2020	3:20 PM	CFL	JAN 8	322			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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

Appendix G

Limitations

LIMITATIONS

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
   (a) The Standard Terms and Conditions which form a part of our Professional Services Contract;
   (b) The Scope of Services;
   (c) Time and Budgetary limitations as described in our Contract; and
   (d) The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the Site and attendant structures. Our conclusions cannot and are not extended to include those portions of the Site or structures, which are not reasonably available, in Wood's opinion, for direct observation.
4. The environmental conditions at the Site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the Site with any applicable local, provincial or federal by-laws, orders-in-council, legislative enactments and regulations was not performed.
5. The Site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on Site and may be revealed by different or other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Wood must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Wood's services during the implementation of any remedial measures will allow Wood to observe compliance with the conclusions and recommendations contained in the report. Wood's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Wood accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Wood.

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited

Attachment 6
Corporate ERP

TERVITA

CORE EMERGENCY RESPONSE PLAN

Tervita 24-Hour Emergency Number:	**1-800-327-7455**
OGC 24-Hour Incident Reporting Line / Emergency Management BC (EMBC):	**1-800-663-3456**
AER 24-Hour Emergency Response Line:	**1-800-222-6514**
SaskER 24-Hour Emergency Response Line:	**1-844-764-3637**

BEHR Integrated Solutions

Date: March 7, 2019

CORE EMERGENCY RESPONSE PLAN

I have received a copy of the Tervita Core Emergency Response Plan. I understand that it is my responsibility to become familiar with the guidelines and procedures outlined in this plan.

Name (Please Print) _____

Company/Organization _____

Position _____

Date _____

Signature _____

Plan No. _____

Mail this completed form to:

Mailing Address: Tervita Corporation
1600, 140 - 10 Avenue S.E.
Calgary, AB T2G 0R1
M: 403-233-7565
F: 403-261-5612

Attention: Health and Safety Department

Rev. 5, March 7, 2019

Acknowledgement and Receipt Form

CORE EMERGENCY RESPONSE PLAN

Revision Request Form

I have received a copy of the Tervita Core Emergency Response Plan. In reviewing the plan I have noticed the following revisions would be beneficial.

Name/Position/Date

Details of requested Revisions

Mail this completed form to:

Mailing Address: Tervita Corporation
1600, 140 - 10 Avenue S.E.
Calgary, AB T2G 0R1
M: 403-233-7565
F: 403-261-5612

Attention: Health and Safety Department

Rev. 5, March 7, 2019

Table of Contents

Administration

Tervita Emergency Response Program Coordinator		
Contact Name	**Telephone Number**	**Email Address**
Paul Finnemore	403-301-4623	pfinnemore@tervita.com

Core Sections

Provincial and/or Regulatory Sections

Site-Specific Supplemental Sections

See Distribution List

Revision Record

To ensure this copy of the plan remains current, record any revisions you receive on the following record form.

Date	Annual Update (Y/N)	Revision # / Update	Details
03-09-2016	-	-	Section 7.0 Incident Support Team (IST) Contact List - Supply Unit
04-05-2016	-	-	Section 7.0 Incident Support Team (IST) Contact List - Logistics Section
04-28-2016		-	Section 6.7 and 6.8 - Firefighting Responsibilities clarified (large fires)
05-31-2016	-	-	Section 7.0 Incident Support Team (IST) Contact List - Command Staff, Planning, Logistics Sections
07-27-2016	-	-	Section 7.0 Incident Support Team (IST) Contact List - Logistics, Finance/Administration Sections
08-31-2016	-	-	Section 7.0 Alternate Emergency Operations Centre (EOC) - updated location address
June 2017	Y	Rev. 1	Update to Section 1.1 - Corporate Health, Safety and Environmental Policy Updates to Section 6.0 - Incident-Specific Response Actions Updates to Section 7.0 – Corporate Telephone Directory Alberta Section – AER First Call Communication Form
August 9, 2018	Y	Rev. 2	Update to Section 1.1 - Corporate Health, Safety and Environmental Policy Updates to Section 7.0 – Corporate Telephone Directory
August 24, 2018	N	Rev. 3	Update Distribution List Update Tervita 24 hr Number throughout document Update Appendix 2 – Communications Plan
September 18, 2018	N	Rev. 4	Updates to Section 7.0 – Corporate Telephone Directory Update revision date in footer throughout the entire document.
March 7, 2019	Y	Rev. 5	Annual Update: Added Response Goals in Section 1.4 Added Recall of Evacuees in Section 4.9 Updates to Section 6.2 - 24-Hr Emergency Number Personnel Response Actions Updates to Section 7.0 – Corporate Telephone Directory, Emergency Calldown Protocol, Incident Support Team (IST) Updates to Provincial/Regulatory Government Sections Updated revision date in footer throughout the entire document.

Date	Annual Update (Y/N)	Revision # / Update	Details
July 26, 2019	N	Rev. 6	Revision 6: Updated Section 7.5 Incident Support Team contacts for IST Liaison Officer, Alternate Operations Section Head, Logistics Section Head, and Supply Unit Leader.

Distribution List

Plan No.	Attention	Location	Site-Specific Supplemental Section (s)
Government			
G-1	BC Oil & Gas Commission	Fort St. John, BC	Yes, Distributed in separate binder(s)
Tervita Internal			
C-1	Emergency Operations Centre (EOC)	Calgary, AB	Yes, Distributed in separate binder(s)
C-2	Emergency Operations Centre (EOC)	Calgary, AB	Yes, Distributed in separate binder(s)
F-1	Incident Command Post (ICP)	Fort St. John, BC	Yes, Distributed in separate binder(s)
F-2	Incident Command Post (ICP)	Fort St. John, BC	Yes, Distributed in separate binder(s)
ERP Provider			
B-1	Behr Integrated Solutions Inc.	Calgary, AB	Yes, Distributed in separate binder(s)

The Tervita Corporate ERP is also located electronically within the Tervita HSE Management System (HSE MS) and is available to all Tervita Responders.

CORE EMERGENCY RESPONSE PLAN

SECTION 1.0 - INTRODUCTION

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

1.0 INTRODUCTION

1.1 CORPORATE HEALTH, SAFETY AND ENVIRONMENTAL POLICY

SAFETY
MATTERS
IN **ALL** THAT WE DO

OUR HEALTH, SAFETY AND ENVIRONMENTAL POLICY

Tervita is committed to delivering the highest standards of health, safety and environmental performance. We believe that Safety Matters in All that we do and that no one should suffer harm at work. This policy statement defines our commitments to our employees, clients, partners and shareholders.

We will deliver our operations and services in ways to:

- Protect the health and safety of all people impacted by our work;
- Prevent incidents and injuries so that everyone can return home unharmed;
- Prevent pollution and minimize our impact on the environment; and
- Responsibly manage all aspects of our business to fulfill compliance obligations.

We will achieve this through:

- Leaders at all levels placing health, safety and environment at the top of their agenda;
- Clear objectives set to measure our performance and support continuous improvement;
- Tervita management and supervisory levels providing appropriate resources, support and training to ensure safe work and accomplish health, safety and environmental objectives;
- Tervita employees being responsible for identifying hazards, determining risk, and being involved in the risk control process;
- Personnel having the authority and responsibility to refuse and stop work without repercussion when an unsafe situation is identified;
- Transparent investigations and open communications on health, safety and the environment to increase awareness;
- Operational audits to support compliance with legislation and our policy, standards, objectives and targets;
- Direction of those who work with us to meet our standards; and
- Tervita employees being responsible for adhering to our Health, Safety and Environment Management System.

JOHN COOPER
Chief Executive Office
January 2019

1.2 CORPORATE EMERGENCY RESPONSE POLICY

Tervita Corporation's (Tervita's) Emergency Response Policy is to initiate immediate emergency response thus minimizing public and environmental exposure and protecting Tervita employees, contract personnel, subsidiaries and assets. In addition, emergency response is intended to limit financial loss and maintain community relations in the event of an incident affecting field operations, district offices and/or our head office. In support of this policy, the following guidelines are identified:

- Personnel and public safety are the primary concerns.
- Notification of an event to key personnel and/or relevant third parties is mandatory.
- Containment of the event is critical to limit injury and damages.
- Reactive responsibilities will be assigned prior to the event occurring, wherever possible.
- External communications will be channeled through the appropriate Tervita spokesperson.
- It is the responsibility of all employees to report any errors or omissions in this emergency response plan to the HSE Department. Effective response is dependent upon all aspects of this emergency response plan being current.
- All personnel under contract operating in Tervita or subsidiary field locations are to be aware of this emergency response plan and understand their responsibilities.

1.3 SCOPE OF THIS EMERGENCY RESPONSE PLAN

This emergency response plan:

- Outlines the common processes to be followed when managing an incident involving properties operated and/or owned by Tervita.
- Identifies the unique provincial and/or regulatory requirements depending upon the location of the incident (the Provincial/Regulatory Sections).
- May have site-specific information for area operations.

Together the Core Sections, a Provincial/Regulatory Section, and a Site-Specific Supplemental Section enable Tervita to carry out an effective response. Specialized emergency response plans, developed by organizations for specific functions can support a response. These plans are called "Emergency Response Assistance Plans (ERAPs)" and may be contained in separate documents.

1.4 KEY ELEMENTS OF AN EMERGENCY RESPONSE

Response Goals

Response Goals should be used to determine priorities in responding to an incident. They are as follows:

1. Safety and health of all responders and the public
2. Save lives
3. Reduce suffering
4. Protect public health
5. Protect critical infrastructure
6. Protect property
7. Protect the environment
8. Reduce economic and social losses.

The following key elements of an emergency response need to be addressed in a timely manner:

- **The safety of Tervita employees, responders and contractors is addressed.**
- An effective, internationally recognised, emergency command structure [the Incident Command System (ICS)] is established.
- **Public protection is maintained through notification (with voluntary evacuation), evacuation, Shelter-In-Place, and/or ignition.**
- Government agencies and local authorities are notified in a timely manner. As required, liaison with these government agencies and local authorities will occur throughout the life of the incident.
- Control and containment efforts are initiated.
- The combined resources (manpower and equipment) of Tervita, mutual aid partners, the government and other external services are effectively utilized.
- Environmental impacts (including air/water/soil quality) are monitored.
- Effective communication is maintained with all responders (Tervita and non-Tervita).
- Factual information is provided to the media, the public, Tervita personnel not involved in the response and other stakeholders in a timely manner.
- Records and evidence are preserved.
- This emergency response plan divides the “boots-on-the-ground” tactical operations into two distinct response areas (on-site response and off-site response).

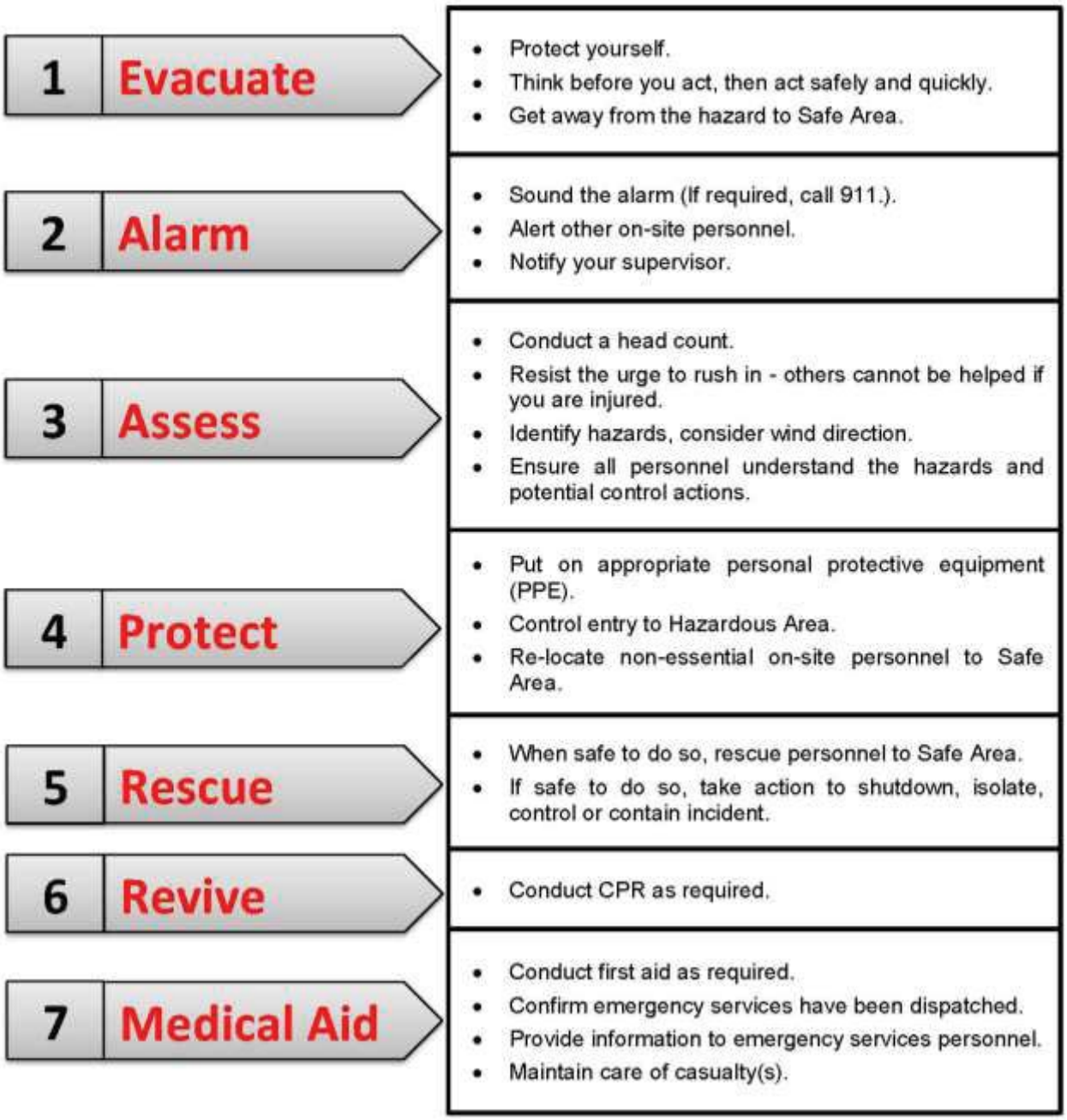
- On-site response focuses on response activities in the immediate vicinity of the incident and is focused on on-site responder safety and control and containment of the hazard.
- Off-site response focuses on response activities in a planning, response zone or beyond and is focused on off-site responder safety, public protection and environmental protection.

To accomplish these goals, Tervita responders must be familiar with this emergency response plan and have an understanding of how response activities will be carried out. Tervita management endorses the following:

- Implementation of reasonable precautions and appropriate mitigative safeguards to minimize the hazard from incidents.
- Adequate emergency response training for Tervita responders.
- Maintenance of this emergency response plan.

1.5 INITIAL ON-SITE ACTIONS – 7 STEPS

Initial On-Site Actions – 7 Steps



1.6 RESPONSE PROCESSES

The following two diagrams depict a typical Tervita response process. The first response process guides the Tervita Incident Management Team (IMT) and the second response process guides the Tervita Incident Support Team (IST).

Incident Management Team (IMT) Response Process

Managing an Incident by Objectives

GET BIG FAST!

The following forms help compile an effective written Incident Action Plan (IAP) for the first Operational Period:

- **Incident Objectives form (ICS Form 202)**
- **Incident Briefing form (ICS Form 201)**
- **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A)**

Primary Objectives:
Responder Safety/Public Protection/Control and Containment

Incident Support Team (IST) Response Process

Managing an Incident by Objectives

GET BIG FAST!

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- **Incident Objectives form (ICS Form 202)**
- **Incident Briefing form (ICS Form 201)**
- **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A)**

Primary Objectives:

Responder Safety/Public Protection/Control and Containment

1.7 INCIDENT FACILITIES

1. **Incident Command Post (ICP):** The location at which the primary command functions are executed. Tervita's Incident Commander establishes the Incident Command Post (ICP) at a suitable, safe location outside the Emergency Planning Zone (EPZ).

   The Incident Command Post (ICP) must have the appropriate equipment, including good communication equipment to manage the incident. **Refer to the appropriate Site-Specific Supplemental Section for the location(s) of the potential pre-assigned Incident Command Post (ICP).**

   During a Unified Command response, Tervita may offer its Incident Command Post (ICP) as the location for Unified Command.

2. **On-site Command Post (OSCP):** On-site responder safety and control and containment activities are directed from a specialized facility called the On-site Command Post (OSCP). Pre-assigned On-site Command Posts (OSCPs) have not been determined.

   The On-site Command Post (OSCP) may be established at a suitable, safe location inside the Emergency Planning Zone (EPZ) and could be as simple as a vehicle equipped with a cellular telephone.

3. **Remote Command Post (RCP):** Tervita may establish a specialized facility called the Remote Command Post (RCP), outside the Emergency Planning Zone (EPZ), to assist with supervising public protection measures or environmental protection activities.

   If established, the Remote Command Post (RCP) is established at a suitable, safe location in the vicinity of the incident. Refer to the appropriate Site-Specific Supplemental Section for the location(s) of the potential pre-assigned Remote Command Post (RCP).

   Emergency Operations Centre (EOC): A designated facility established by Tervita to support incident command. The Incident Director leads Tervita's Incident Support Team (IST) from this Emergency Operations Centre (EOC). As required, Tervita's Incident Support Team (IST) provides advice and support to Tervita's Incident Management Team (IMT). As required, Tervita's Incident Support Team (IST) notifies and/or obtains advice and support from Tervita Senior Management.

   Refer to Section 7.0 for the location(s) of the pre-assigned Tervita Emergency Operations Centres (EOC).

4. **Regional Emergency Operations Centre (REOC):** A specialized operations centre established in a suitable location, outside the Emergency Planning Zone (EPZ), to manage the larger aspects of the incident and manned jointly by government and industry staff.

5. **Reception Centre**: Tervita Reception Centre personnel establish a specialized facility called the Reception Centre outside the Emergency Planning Zone (EPZ) at a suitable, safe location in the vicinity of the incident.

   Tervita Reception Centre personnel address the concerns and immediate needs of the evacuated public. Arrangements for alternative accommodation, reimbursement of daily expenses and temporary care of evacuated property are managed through the Reception Centre. Evacuees will **not** be housed at the Reception Centre. **Refer to the appropriate Site-Specific Supplemental Section for the location(s) of the pre-assigned Reception Centre.**

6. **Staging Area:** As required, Tervita will establish a Staging Area. The Staging Area is a control point for regulating the flow of available resources (equipment and manpower) to and from the incident site and the planning and response zones.

   If established, the Staging Area will be located at a suitable, safe location, outside the Emergency Planning Zone (EPZ), but within the vicinity of the incident. **Pre-assigned Staging Areas have not been determined**. In some cases, the Staging Area may be co-located with other incident facilities.

7. **Muster Area:** A safe location set up at an incident where on-site personnel can meet for a head count and be given further instructions and/or assigned responsibilities.

8. **Municipal Emergency Operations Centre (MEOC):** Activated by the local authority, the Municipal Emergency Operations Centre (MEOC) supports the local authority's emergency response.

9. **Provincial Operations Centre (POC):** The provincial government may establish this centre if the incident is likely to significantly impact the public. The Provincial Operations Centre (POC) may be activated to support the activities of the Regional Emergency Operations Centre (REOC) and/or the local authority's Municipal Emergency Operations Centre (MEOC).

   The Provincial Operations Centre (POC) has the capability of accessing provincial, federal and other resources (manpower and equipment) to support the emergency response. The Provincial Operations Centre (POC) may also keep elected officials informed.

1.8 DETECTION OF AN INCIDENT

Tervita personnel may initially become aware of an incident from a wide range of detection methods and sources.

Detection methods may include:

- Supervisory Control and Data Acquisition (SCADA) systems
- Pressure detection systems
- Flow monitors
- Air monitors
- Visual observation
- Audible observation

- Odour

The following sources may also advise Tervita about an incident:

- Tervita field operators
- Contract personnel
- Other industrial operators
- Government agencies
- Public
- Media

1.9 INVESTIGATION OF PUBLIC COMPLAINTS AND INQUIRIES

Sources outside of Tervita may see or hear a problem before a company representative does. Any reports, concerns or complaints raised by sources outside of Tervita must be promptly investigated.

Unless conditions indicate otherwise, an odour complaint **is not** declared an emergency until the incident has been investigated and verified. However, it is essential that Tervita respond thoroughly and professionally.

A follow-up call **must** be made to inform the caller about the results of any investigation.

1.10 SPILL COOPERATIVE RESPONSE PLANS

Tervita is exempt from the requirement to develop its own spill response plan, purchase spill cleanup equipment and conduct an annual exercise if it is an active member in good standing of an oil spill cooperative.

1.11 EMERGENCY PREPAREDNESS STANDARDS (UPDATES, TRAINING AND EXERCISES)

Tervita's HSE Department ensures this plan is maintained. Information in this plan is to be verified and updated as required by regulation. The names and telephone numbers in this plan must be kept current for the plan to be effective.

Emergency Response Plan Review Meetings and Response Exercises: Emergency preparedness will be reviewed regularly with Tervita personnel and contract operators. As a minimum, Emergency Response Plan Review Meetings will be conducted as required by regulation.

Response exercises help company responders practice and measure how knowledgeable they are in emergency response. Refer to the Provincial/Regulatory Section for the procedure, for response exercise and advance notification of exercises requirements.

Response exercises may only involve internal personnel or may involve mutual aid partners and government agencies. These exercises allow responders to practice their roles and identify opportunities to improve emergency preparedness. As a minimum,

response exercises will be conducted as required by regulation. Exercises may include any of the following types:

- **Actual Emergency:** When adequately evaluated and documented, the response to an actual emergency can serve as effective training.
- **Orientation Exercise:** Used to introduce participants to, or refresh them on emergency response plans, roles and responsibilities, and processes and is conducted through the use of lectures, discussions, presentations, or talking through the various scenarios and their required actions.
- **Drills:** Test a single emergency response function and often involve actual field response. Their effectiveness lies in focusing on a single or relatively limited part of the response system in order to evaluate and improve it.
- **Table-top Exercise:** These exercises are conducted in a classroom setting in a stress-free environment. Participants discuss the responses to various prepared scenarios. Does not involve the deployment or actual use of resources (manpower and equipment).
- **Functional Exercise:** Is a simulation of an incident that includes a description of the situation, a timed sequence of messages, and communication between players and a simulation group. Participants practice coordinated, effective response in a time-pressured, realistic yet simulated emergency.
- **Communication Exercise:** During a communication exercise, responders play their roles from assigned locations using the communication equipment that would usually be deployed in a real incident.
- **Full-scale (Major) Exercise:** These exercises validate the major aspects of the company's emergency preparedness program and involve all levels of the organization and government agencies. As a minimum, full-scale exercises will be conducted as required by regulation and involves the deployment or actual use of resources (manpower and equipment).

NOTE: Tervita will document all Emergency Response Plan Review Meetings and response exercises.

1.12 FACILITY MODIFICATIONS

Before any major modification is brought on-stream, relevant data about the modified facility must be added to the appropriate Site-Specific Supplemental Section. If required by regulation, Tervita **will** submit the modified site-specific information to the regulator for approval, prior to bringing the facility on-stream.

An Emergency Response Plan Review Meeting for Tervita personnel and contract operators will be held before major facility modifications are commissioned by the company. As required by regulation, government agencies will be invited to attend the Emergency Response Plan Review Meeting.

CORE EMERGENCY RESPONSE PLAN

SECTION 2.0 - RESPONDER SAFETY

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

2.0 RESPONDER SAFETY

2.1 SITE HAZARDS

Response personnel must stay out of the Hazardous Area until the hazards are identified and assessed. All responders must evaluate potential site hazards including ignition sources or vapours gathering in low-lying areas such as ditches, trenches and forested areas. The nature of a hazard will influence the responses. Therefore, the following characteristics about the hazard must be considered:

- The quantity and type of product involved.
- The potential for the situation to escalate.
- The location of the incident, the time of day and the weather conditions.
- Actual and perceived hazard to responders, the public and the environment.
- The number of responders and their training.
- The availability of response equipment.
- The availability of external support (e.g. ambulances, police, fire fighters, mutual aid).

Responders must approach an incident site that may have gases or explosive vapours from an upwind or crosswind direction. They should inspect the site from a distance (using binoculars if possible) if hazards have not been assessed. When on-site, responders must take the following precautions:

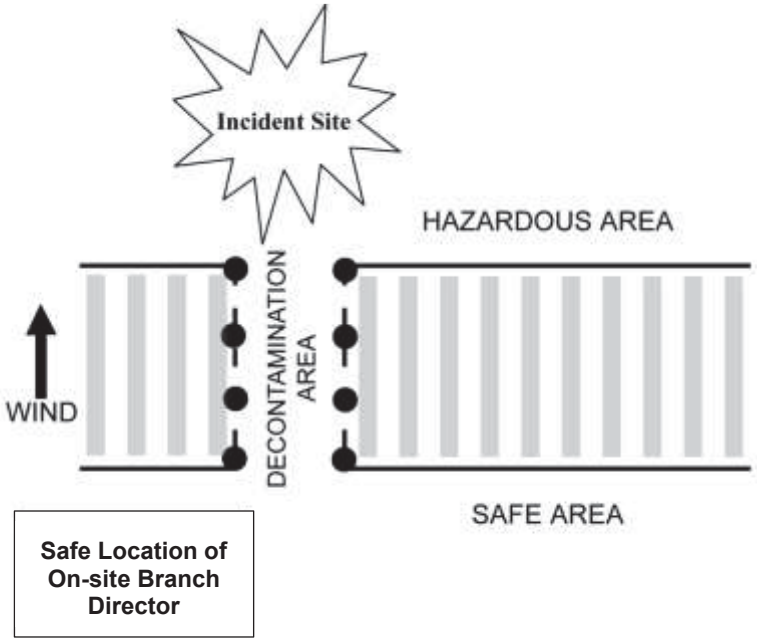
- Identify safe escape routes away from Hazardous Area.
- Continue to assess the related hazards (e.g. toxic vapours, fire or explosion hazards).
- Protect themselves and others before initiating control and containment operations.
- Remember, personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- Do not allow anyone, including first responders such as police, fire fighters or ambulance attendants to enter the Hazardous Area unless they are escorted, properly trained, equipped with personal protective equipment (PPE) and it has been approved by the Incident Commander.
- Avoid extinguishing an ignited hydrocarbon release if the supply cannot be stopped.
- Only attempt fire control on small fires. Extensive fires or uncontrolled facility fires must be dealt with by external firefighting professionals. Responders must not attempt to battle a fire without adequate firefighting equipment, training and backup personnel.

- Advise fire authorities when a Tervita facility is threatened by an external fire. Fire authorities should also be made aware of dangerous products or flammable hazards at the facility, such as pressurized LPG vessels, chemical and fuel storage.
- Consider an outside expert when necessary. Well control, for example, is a speciality requiring specific experience, equipment and procedures.

2.2 ON-SITE WORK AREAS

Tervita should separate the incident site into three distinct areas to clearly identify the high-risk areas and to reduce the hazards to the on-site responders. These three areas are defined as the “Safe Area”, the “Hazardous Area” and the “Decontamination Area”.

THESE THREE ON-SITE WORK AREAS MUST NOT BE CONFUSED WITH A PLANNING OR RESPONSE ZONE. ON-SITE WORK AREAS ARE PERTINENT TO ON-SITE RESPONDERS ONLY.



Safe Area

The Safe Area is an area verified by Tervita to be safe for responders. The On-site Command Post (OSCP) is located in the Safe Area. The Safe Area must be continually monitored and evaluated to confirm its safety to responders. If there is any concern about the area’s safety to responders, Tervita will relocate the On-site Command Post (OSCP) to an area proven to be safe.

Hazardous Area

Extreme caution and planning must be undertaken when entering the Hazardous Area. Access to and from the Hazardous Area will be controlled. Only personnel with appropriate personal protective equipment (PPE), training, accreditation, an understanding of the specific response and control procedures, and approved by the Incident Commander will be allowed into the Hazardous Area. An example of this strategy is confined space entry and rescue. Prior to entry into the Hazardous Area, all personnel should fully understand the objectives and strategies to be employed, the method of on-site responder communication and the rescue plan.

The following guidelines help Tervita determine the Hazardous Area. An area is considered hazardous if any of the following conditions exist:

- Combustible gas reading of 10% LEL or greater.
- H_2S gas readings at or above 10 ppm.
- SO_2 readings of 5 ppm or greater for 15 minutes.
- Oxygen content of less than 19.5% or greater than 22%.
- Presence of toxic concentrations of organic and inorganic vapours/gases and liquids. [Consult Safety Data Sheets (SDS) for toxicity data.]
- An area Tervita deems to be hazardous, such as the area surrounding a fire or spill.

Tervita will consider the following on-site conditions when determining the size of the Hazardous Area:

- The location of access routes, power lines, pipelines, fire and other explosion hazards.
- Areas where vapours are likely to accumulate such as downwind areas, low areas, confined spaces.
- Scene stability (e.g. steep slopes, overhanging banks, unstable soil, thin ice).
- Weather conditions.
- Properties and evacuation data for the product involved.
- SDS sheets. (May not be included in this emergency response plan.)

Decontamination Area

Personnel responding to hazardous substance emergencies may become contaminated in several ways:

- Contacting vapours, gases, mists or particulate in the air.
- Being splashed by materials while sampling or opening a container.
- Walking through puddles of liquids or on contaminated soil.
- Using contaminated instruments or equipment.

Decontamination is the complete or partial removal or neutralization of the harmful contamination chemicals. Some equipment will not withstand a proper decontamination process and therefore must be destroyed. Tervita must determine whether response clothing, instruments and equipment should be decontaminated or destroyed.

The Decontamination Area is usually set up in response to a hazardous material spill and when decontamination of personnel and equipment is required. The Decontamination Area buffers the Hazardous Area and the Safe Area. Decontamination Areas should be set up in areas that are not affected by the on-site hazard. Any contaminated personnel and equipment leaving the Hazardous Area must be decontaminated in the Decontamination Area before continuing to the Safe Area.

Equipment, solutions and procedures required for decontamination depend on the type and degree of contamination. All hazardous waste must be disposed of according to applicable waste management regulations.

2.3 REST PERIODS

Responders are under a great deal of stress. Fifteen-minute rest periods should be scheduled every two hours for all responders. If possible, they should be provided with a sheltered place to sit or lie down, nutritious food and potable water or juices.

2.4 CRITICAL INCIDENT STRESS DEBRIEFING (CISD)

If necessary, Tervita will dispatch trained personnel to meet with the responders, preferably within 24 to 48 hours to provide support and reassurance to those affected by an incident.

SECTION 3.0 - INCIDENT COMMAND SYSTEM (ICS) ORGANIZATIONAL CHART

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

3.1 INCIDENT COMMAND SYSTEM (ICS) ORGANIZATIONAL CHART

INCIDENT MANAGEMENT TEAM (IMT) ORGANIZATIONAL CHART

ROLE: Manage the Incident

FIVE PRIMARY INCIDENT COMMAND SYSTEM (ICS) MANAGEMENT FUNCTIONS

- OPERATIONS (DOERS)
- LOGISTICS (GETTERS)
- COMMAND (BOSS)
- PLANNING (THINKERS)
- FINANCE/ ADMINISTRATION (PAYERS)

INCIDENT COMMANDER(S) (Single or Unified)

- Incident Commander
- Deputy Incident Commander
- Information Officer
- Safety Officer
- Liaison Officer
  - Petroleum Regulatory Agency
  - Local RCMP/Local Police
  - Local Authorities (Counties/Municipalities/Regional Districts, etc.)
  - Local Health Region/Authority
  - Remaining Government Agencies Outlined on the Notification Matrices in the appropriate Provincial and/or Regulatory Section

Operations Section Chief

ON-SITE
- On-site Responder Safety (including site-safety as required)
- Control and Containment of the Hazard

OFF-SITE
- Off-site Responder Safety
- Public Protection
- Environmental Protection

Refer to "Operations Section Organization Chart"

Planning Section Chief

- Resources Unit
- Documentation Unit
- Situation Unit
- Demobilization Unit
- Technical Specialists

Logistics Section Chief

- Service Branch
  - Communications Unit
  - Medical Unit
  - Food Unit
- Support Branch
  - Supply Unit
  - Facilities Unit
  - Ground Unit

Finance/ Administration Section Chief

- Time Unit
- Compensation/ Claims Unit
- Procurement Unit
- Cost Unit

INCIDENT SUPPORT TEAM (IST) ORGANIZATIONAL CHART

ROLE: Provide Advice and Support to the Incident Management Team (IMT)

- Incident Director
  - Senior Management
- Deputy Incident Director
- IST Information Officer
  - Interfaces With Involved Media
  - Internal Incident-Related Information
- IST Safety Officer
- IST Liaison Officer
  - As requested, supports the Incident Management Team (IMT) with government notifications.

Operations Section Head

Operational Support As Required

Planning Section Head

- Resources Unit
- Documentation Unit
- Situation Unit
- Demobilization Unit
- Technical Specialists

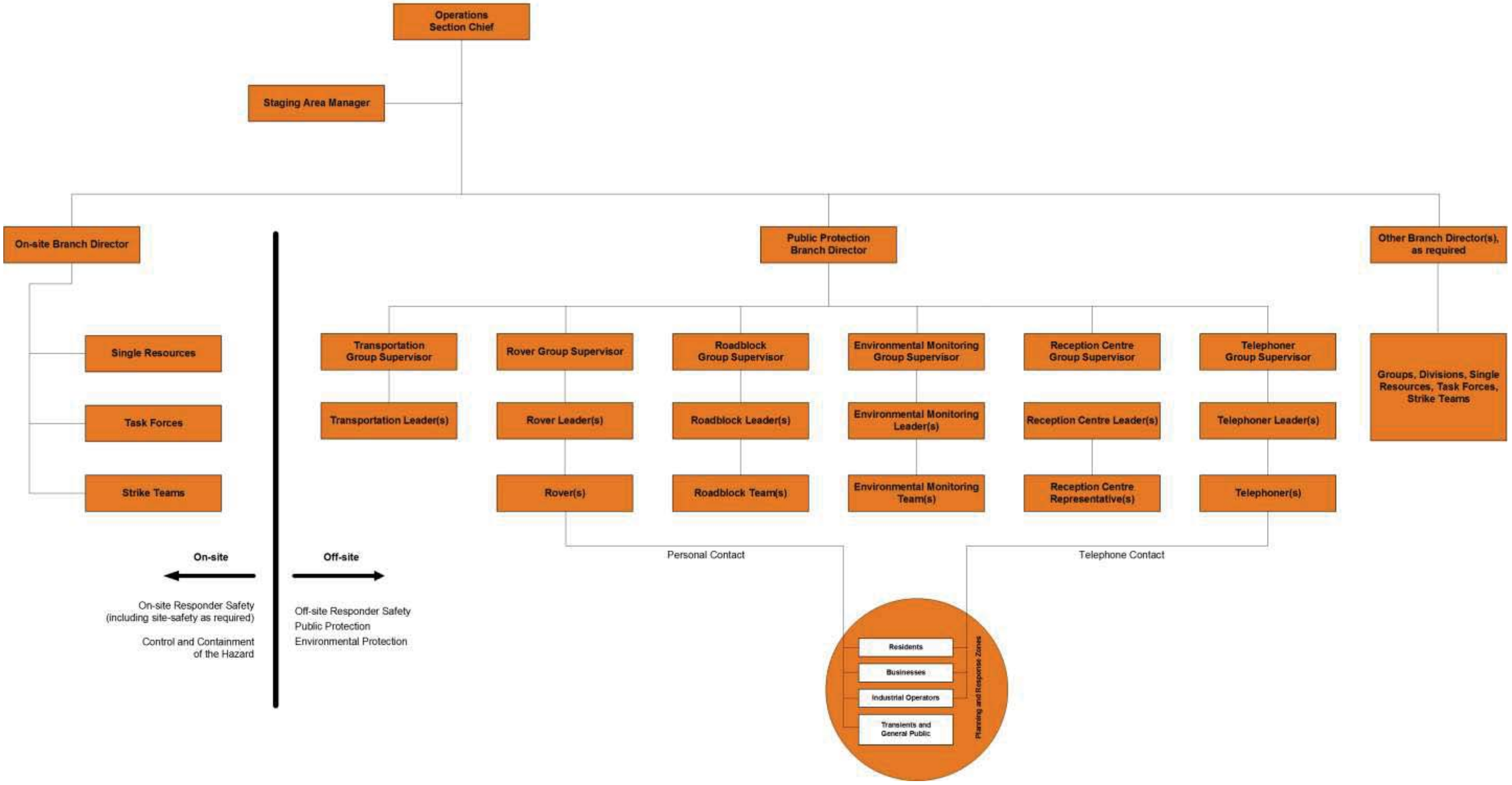
Logistics Section Head

- Service Branch
  - Communications Unit
  - Medical Unit
  - Food Unit
- Support Branch
  - Supply Unit
  - Facilities Unit
  - Ground Unit

Finance/ Administration Section Head

- Time Unit
- Compensation/ Claims Unit
- Procurement Unit
- Cost Unit

Operations Section Organization Chart



SECTION 4.0 – RESPONSE TEAM DUTIES

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

4.0 RESPONSE TEAM DUTIES

4.1 ON-DUTY INCIDENT DIRECTOR

Role: The Tervita On-duty Incident Director acts as the Tervita Calgary focal point for incident investigation, alert or emergency notification both inside and outside working hours for a defined and scheduled period of time.

Located at: The Tervita On-duty Incident Director is required to remain within a 60-minute driving radius of Calgary and will respond to the Emergency Operations Centre (EOC) if required.

Assigned by: Tervita Senior Management

Advises and Supports: Incident Commander during an incident investigation, Alert, Minor Incident, or Level One, Two or Three Emergency

RESPONSIBILITIES

Incident Investigation, Alerts, Minor Incidents, Level One, Two or Three Emergency

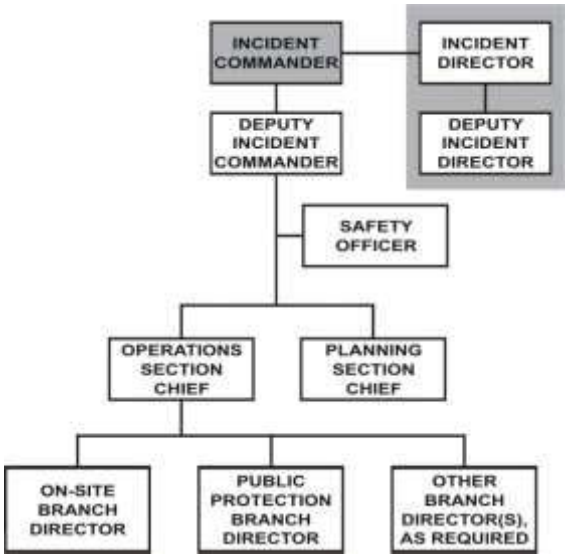
- ❒ Obtain the caller's name, company *name* (if appropriate) and a call-back telephone number in case telephone connection is lost.
- ❒ If the caller is a member of the public, instruct the caller to Shelter-In-Place.
- ❒ Record all available details about the incident. Chronologically document all action, decisions, contacts and requests on an **Activity Log (ICS Form 214)**.
- ❒ Once the call has ended, confirm validity of the call by dialling the call-back telephone number and verifying the conversation with the caller.
- ❒ As dictated by the location and/or type of incident, contact the appropriate Tervita Incident Commander and confirm the severity of the incident (Incident Investigation, Alert, Minor Incident, Level One, Two or Three Emergency).
- ❒ Determine if you are the appropriate person to remain as a Tervita Incident Director. If yes, refer to the Response Team Duties for the Incident Director. If no, mobilize the appropriate Tervita Incident Director.
- ❒ As requested by the Tervita Incident Director:
  - ❒ Mobilize other Tervita Incident Support Team (IST) members.
  - ❒ Begin to set up the Tervita Emergency Operations Centre (EOC).

  NOTE: The Deputy Incident Director is available to assist you with these duties.
- ❒ Once activated, forward all data related to the incident to the Incident Director.

Postincident Duties

- ❒ Resume the role of the Tervita **On-Duty** Incident Director.

4.2 INCIDENT COMMANDER

<table>
<tr><td>Primary Objectives</td><td colspan="2">1. Responder safety
2. Public protection
3. Control and containment of the hazard</td><td>Suggested Primary ICS Positions
(Other positions mobilized as required.)</td></tr>
<tr><td>Role</td><td colspan="2">Commands the Incident Management Team (IMT) to maximize responder safety, public protection and control and containment of the hazard.</td><td rowspan="10"> 
</td></tr>
<tr><td>Located at</td><td colspan="2">Incident Command Post (ICP)</td></tr>
<tr><td rowspan="8">Supervises Activities of</td><td>Deputy Incident Commander</td><td>Assists Incident Commander.</td></tr>
<tr><td>Information Officer</td><td>Assists with the interfacing with involved media.</td></tr>
<tr><td>Safety Officer</td><td>Maximizes responder safety.</td></tr>
<tr><td>Liaison Officer</td><td>Interfaces with government agencies.</td></tr>
<tr><td>Operations Section Chief</td><td>Manages tactical operations - "Doers".</td></tr>
<tr><td>Planning Section Chief</td><td>Compiles action plan/documents response - "Thinkers and Documenters".</td></tr>
<tr><td>Logistics Section Chief</td><td>Procures resources (manpower and equipment) - "Getters".</td></tr>
<tr><td>Finance/Administration Section Chief</td><td>Ensures cost accounting - "Payers".</td></tr>
<tr><td>Obtains Advice and Support from</td><td colspan="2">Incident Support Team (IST)</td></tr>
<tr><td>Public Protection Measures</td><td colspan="3">Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).</td></tr>
<tr><td colspan="2">Information Exchange (Informal Communication)</td><td colspan="2">Open to responders to freely exchange information.</td></tr>
<tr><td colspan="2">Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)</td><td colspan="2">Must follow the hierarchy of command (chain of command) unless otherwise directed.</td></tr>
</table>

Incident Investigation, Alerts and Minor Incidents

- ❒ Dispatch trained and accredited personnel (preferably in pairs – the "buddy system") with personal protective equipment (PPE) to investigate. Personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- ❒ In conjunction with the personnel dispatched to the incident site, assess the situation.
- ❒ Utilizing the appropriate Provincial and/or Regulatory Section, classify the incident. Oversee the response to a non-emergency. If an emergency is declared, proceed with responsibilities for a Level One, Two or Three Emergency.
- ❒ Chronologically document all action, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.

Level One, Two or Three Emergency

- ❒ Assign a name to the incident. Keep the name "general" and do not use the company name or any other identifying features.
- ❒ Chronologically document all action, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Refer to the Initial On-site Actions – 7 Steps diagram and the Incident Management Team (IMT) Response Process (Response P) diagram in Section 1.0.
- ❒ Refer to the **Prompting Questions in Assessing an Incident** form.
- ❒ Dependent upon the type of emergency, refer to Section 6.0, Incident-Specific Response Actions.
- ❒ Resist the urge to do all tasks. Delegate responsibilities. Appoint others to carry out Incident Management Team (IMT) response functions. **Get Big Fast!** Proactively mobilize the following:
  - ❒ Deputy Incident Commander
  - ❒ Information Officer
  - ❒ Safety Officer
  - ❒ Liaison Officer
  - ❒ Operations Section Chief
  - ❒ Planning Section Chief
  - ❒ Logistics Section Chief
  - ❒ Finance/Administration Section Chief
- ❒ Refer to the appropriate Provincial and/or Regulatory Section. Each province and/or regulator has specific and unique reporting and other response requirements. Ensure a member of the Incident Management Team (IMT) reviews the appropriate Provincial and/or Regulatory Section in detail.
- ❒ Refer to the Site-Specific Supplemental Section. Site-Specific Supplemental Sections may not exist for wells, pipelines or facilities that do not require a regulatory-approved emergency response plan.

Complexity Analysis Factors
❒ Evaluate how many members of the public could be inside the planning zone and the response zones. Account for residents, businesses, First Nations persons, trappers, guide/outfitters, grazing lessees, transients, waterways, rail lines, etc. **NOTE: Ensure the appropriate public protection measures for the planning zone and the response zones are carried out for the specific level of emergency. Refer to the appropriate Provincial and/or Regulatory Section.**
❒ Determine if there are roads and how many lead into the planning zone and the response zones.
❒ Determine if there is potential for environmental damage.
❒ Evaluate which government agencies have jurisdiction inside the planning and response zones.
❒ Assess weather conditions. Determine if they could impact emergency response efforts.

- ❒ Utilizing the appropriate Provincial and/or Regulatory method, assign a level of emergency to the incident.

- ❒ Ensure the On-Duty Incident Director is aware of the incident.
- ❒ Activate the Incident Command Post (ICP) and confirm that there is adequate communication between all incident facilities.
- ❒ As prepared by the Planning Section Chief, approve the **Incident Objectives** form **(ICS Form 202)**. This will establish incident objectives!
- ❒ Ensure the Planning Section Chief completes an **Incident Briefing** form **(ICS Form 201)**. This will establish incident strategies and tactics and track assigned resources (manpower and equipment)!
- ❒ Ensure the Safety Officer completes an **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A)**. This will identify the hazards to responders!
- ❒ Approve the implementation of the overall Incident Action Plan (IAP).
- ❒ Assess whether cellular telephones should be used. They are not secure.
- ❒ Ensure the following is prepared:
  - ❒ An on-site responder safety action plan.
  - ❒ A planning zone and a response zones' responder safety action plan.
  - ❒ A planning zone and a response zones' public protection measure action plan.
  - ❒ An emergency control and containment action plan.
  - ❒ An environmental monitoring strategy. If the emergency involves hydrogen sulphide (H_2S), high vapour pressure (HVP), or as required ensure an appropriate air monitoring strategy is employed.
- ❒ Ensure Tervita is prepared to receive public inquiries.
- ❒ Ensure the public outside any planning or response zone, who may perceive themselves to be at risk, are informed about the emergency.
- ❒ Refer all media inquiries and public inquiries to the Information Officer. Approve all Tervita media releases.
- ❒ Ensure all responders understand the nature and extent of the emergency, are aware of any hazards, and are carrying out their assigned duties.
- ❒ Confirm with the Planning Section Chief (if established) that adequate incident documentation is being compiled.
- ❒ Schedule and conduct frequent Incident Management Team (IMT) briefings. The Planning Section Chief should facilitate these briefings.
- ❒ Set the time length for the Operational Period.
- ❒ Approve the need for additional Incident Management Team (IMT) personnel.
- ❒ Ensure the Incident Director (if established), reviews the Incident Action Plan (IAP).
- ❒ As required, consider the need to establish Unified Command.

- ❒ Review Tervita's ignition guidelines (Refer to Section 5.0, Ignition for ignition equipment and procedures and the appropriate Provincial and/or Regulatory for specific ignition criteria). The decision-making authority to ignite must be assigned to an on-site Tervita representative.
- ❒ If any ignition criteria are met (Section 5.0), ensure Tervita ignites the release.

Postincident Duties

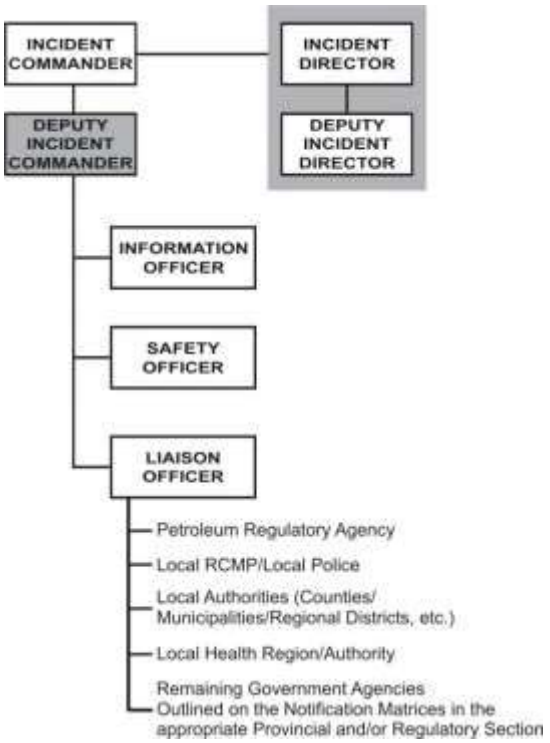
- ❒ In conjunction with the appropriate authorities, stand down the emergency. Refer to the appropriate Provincial and/or Regulatory Section for downgrade or stand-down emergency criteria.
- ❒ Ensure all responders are notified.
- ❒ Ensure all notified public and media are informed.
- ❒ Initiate and coordinate postincident duties.
- ❒ Approve the overall Postincident Action Plan.
- ❒ The incident site is not to be disturbed until all necessary site investigations have been completed by government or company representatives.
- ❒ If required, request that the Incident Director procure personnel to conduct Critical Incident Stress Debriefing (CISD).
- ❒ Coordinate and carry out a Postincident Debrief with Incident Management Team (IMT) personnel.

4.3 DEPUTY INCIDENT COMMANDER

<table>
<tr><td>Primary Objectives</td><td colspan="2">1. Responder safety
2. Public protection
3. Control and containment of the hazard</td><td>Suggested Primary ICS Positions
(Other positions mobilized as required.)</td></tr>
<tr><td>Roles</td><td colspan="2">As required, assists the Incident Commander to maximize responder safety, public protection and control and containment of the hazard.

Fills one or more Command Staff functions until these are assigned.

Helps to set up the Incident Command Post (ICP).

As required, communicates with the Incident Director or Deputy Incident Director.</td><td rowspan="10"> 
</td></tr>
<tr><td>Located at</td><td colspan="2">Incident Command Post (ICP)</td></tr>
<tr><td rowspan="8">May Assist in Supervising the Activities of</td><td>Information Officer</td><td>Assists with the interfacing with involved media.</td></tr>
<tr><td>Safety Officer</td><td>Maximizes responder safety.</td></tr>
<tr><td>Liaison Officer</td><td>Interfaces with government agencies.</td></tr>
<tr><td>Operations Section Chief</td><td>Manages tactical operations - "Doers".</td></tr>
<tr><td>Planning Section Chief</td><td>Compiles action plan/documents response - "Thinkers and Documenters".</td></tr>
<tr><td>Logistics Section Chief</td><td>Procures resources (manpower and equipment) - "Getters".</td></tr>
<tr><td>Finance/Administration Section Chief</td><td>Ensures cost accounting - "Payers".</td></tr>
<tr><td>Obtains Advice and Support from</td><td colspan="2">Incident Support Team (IST)</td></tr>
<tr><td>Public Protection Measures</td><td colspan="3">Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).</td></tr>
<tr><td colspan="2">Information Exchange (Informal Communication)</td><td colspan="2">Open to responders to freely exchange information.</td></tr>
<tr><td colspan="2">Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)</td><td colspan="2">Must follow the hierarchy of command (chain of command) unless otherwise directed.</td></tr>
</table>

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

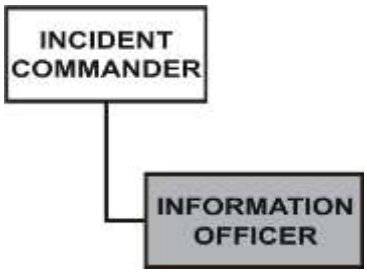
- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ As required, assist the Incident Commander.

- ❒ As required, dependent upon the type of emergency, refer to Section 6.0, Incident-Specific Response Actions.
- ❒ As required, fill one or more Command Staff functions until these are assigned.
- ❒ As required, help to set up the Incident Command Post (ICP).
- ❒ As required, communicate with the Incident Director or Deputy Incident Director.
- ❒ Participate in Incident Management Team (IMT) briefings.

Postincident Duties

- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the incident to the Planning Section Chief.

4.4 INFORMATION OFFICER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Assists with the interfacing with involved media. Works with the IST Information Officer to provide internal incident-related information.	
Located at	Incident Command Post (ICP)	
Reports to/ Assigned by	Incident Commander	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Refer to Section 6.0, Media and Appendix 2 - Communications Plan for further details about media interaction.
- ❒ As required, mobilize assistants.
- ❒ Ensure the Incident Commander approves all media releases.
- ❒ The IST Information Officer will prepare and coordinate media releases. Assist with the interfacing with involved media.
- ❒ If approached or contacted by the media, a Tervita employee or responder may give a Brief Factual Media Statement. Refer to Section 6.0 for an example Brief Factual Media Statement.
- ❒ Ensure the public outside any planning and response zone, who may perceive themselves to be at risk, are informed about the emergency.
- ❒ Work with the IST Information Officer to provide internal incident-related information.
- ❒ Participate in Incident Management Team (IMT) briefings.

Postincident Duties

- ❒ If required, continue media, internal and mass public interaction.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the incident to the Planning Section Chief.

4.5 SAFETY OFFICER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Develops and recommends measures for maximizing responder safety. Completes an Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A). Reviews the Incident Briefing form (ICS Form 201), the Incident Objectives form (ICS Form 202), and the overall Incident Action Plan (IAP) for responder safety implications. Discontinues any operation which threatens the health and safety of responders.	
Located at	Incident Command Post (ICP)	
Reports to/ Assigned by	Incident Commander	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

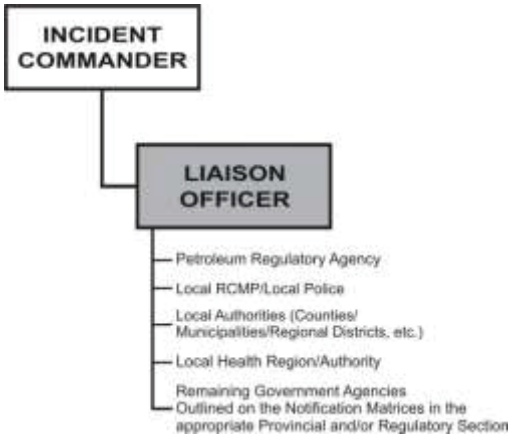
- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Develop and recommend measures for maximizing responder safety. (Refer to Section 2.0, Responder Safety.)
- ❒ As required, mobilize assistants.
- ❒ Review the Incident Action Plan (IAP) for responder safety implications.

- ❒ Utilizing the Resources Summary portion of the **Incident Briefing** form **(ICS Form 201)**, complete an **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A).**
- ❒ Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) before they are dispatched to any incident facility or a planning zone and a response zone. Personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- ❒ Ensure all Incident Management Team (IMT) responders follow the appropriate safe-work procedures.
- ❒ Order the discontinuation of any operation which threatens the health and safety of responders.
- ❒ Obtain a head count of all responders dispatched to any incident facility or a planning zone and a response zone.
- ❒ Assess requirements for additional on-site safety, planning zone and response zones responder safety personnel/equipment.
- ❒ Ensure any incident casualties receive first aid and ongoing care. If any serious injuries have occurred, ensure that the incident scene remains undisturbed if possible, until there is a thorough investigation.
- ❒ Participate in Incident Management Team (IMT) briefings.

Postincident Duties

- ❒ Review the Postincident Action Plan for responder safety implications.
- ❒ Monitor postincident operations for responder safety implications.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the incident to the Planning Section Chief.

4.6 LIAISON OFFICER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Role	Interfaces with government agencies involved in the response.	
Located at	Incident Command Post (ICP)	
Reports to/ Assigned by	Incident Commander	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

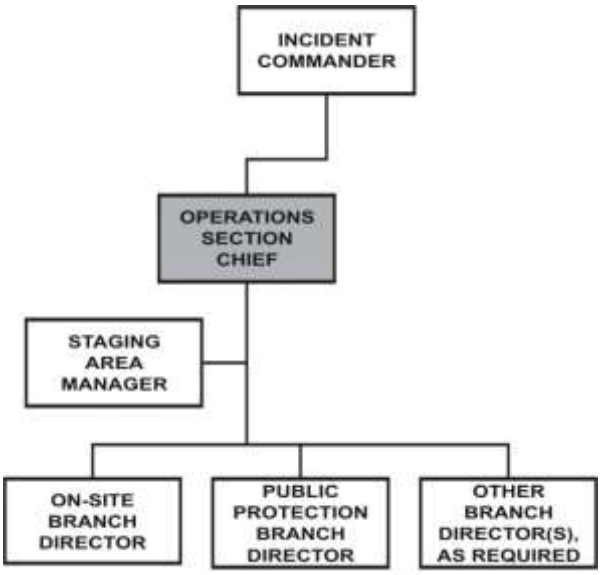
- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Each province and/or regulator has specific and unique reporting and other response requirements. Ensure the appropriate Provincial and/or Regulatory Section is reviewed in detail.
- ❒ As required, mobilize assistants.
- ❒ For the area covered by any planning zone and the response zone, notify the government agencies outlined on the appropriate Provincial and/or Regulatory Section - Notification Matrix.
- ❒ Complete the appropriate Provincial and/or Regulatory Section - emergency reporting form.
- ❒ During any level of emergency, agency representatives may request to attend the Incident Command Post (ICP).

- ❒ Coordinate the flow of information to and from the government agencies.
- ❒ Coordinate the use of expertise and resources (manpower and equipment) available through government agencies.
- ❒ Assess the need for a Fire Hazard Order/Closure Order or Local State of Emergency to close the area inside a planning and response zone. Contact the appropriate government agency to request this.
- ❒ Assess the need for a Notice to Airmen (NOTAM) for closure of air space above the incident site. Contact NAV CANADA to request this.
- ❒ Participate in Incident Management Team (IMT) briefings.

Postincident Duties

- ❒ Notify all government agencies contacted by Tervita.
- ❒ For any required postincident report requirements, refer to the appropriate Provincial and/or Regulatory Section.
- ❒ Review other regulations (industry, safety, environmental, etc.) to see if and when other postincident reports need to be submitted.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the incident to the Planning Section Chief.

4.7 OPERATIONS SECTION CHIEF

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard		Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Supervises tactical activities at the incident site to maximize on-site responder safety and control and containment of the hazard. Supervises tactical planning and response zones activities (responder safety and public protection measures) to maximize public protection.		
Located at	Incident Command Post (ICP)		
Supervises Activities of	On-site Branch Director	On-site responder safety and control and containment of the hazard.	
	Public Protection Branch Director	Planning and response zones, responder safety and public protection measures to maximize public protection.	
	Other Branch Director(s), as required	Examples could be Recovery Branch Director, Wildlife Branch Director, etc.	
	Staging Area Manager	Oversees the movement of available resources (manpower and equipment) at the Staging Area.	
Reports to/ Assigned by	Incident Commander		
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).		
Information Exchange (Informal Communication)	Open to responders to freely exchange information.		
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.		
Single Resources	Single Resources include both personnel and their required equipment (e.g. On-site Safety).		
Task Forces	A Task Force is a combination of <u>different</u> types and kinds of single resources assembled for a particular tactical need, with common communications and a leader (e.g. Well Control Task Force). Task forces can be pre-determined or assembled at an incident from available single resources. Span of control guidelines apply.		
Strike Teams	A Strike Team is a combination of the <u>same</u> types and kinds of single resources assembled for a particular tactical need, with common communications and a leader (e.g. Fire Fighting Task Force). Strike teams can be pre-determined or assembled at an incident from available single resources. Span of control guidelines apply.		

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Dependent upon the type of emergency, refer to Section 6.0, Incident-Specific Response Actions.
- ❒ As required, mobilize a deputy.
- ❒ Ensure a Complexity Analysis is performed for any planning zone or response zone:

Complexity Analysis Factors
❒ Evaluate how many members of the public could be inside the planning zone and the response zones. Account for residents, businesses, First Nations persons, trappers, guide/outfitters, grazing lessees, transients, waterways, rail lines, etc. **NOTE: Ensure the appropriate public protection measures for the planning zone and the response zones are carried out for the specific level of emergency. Refer to the appropriate Provincial and/or Regulatory Section.**
❒ Determine if there are roads and how many lead into the planning zone and the response zones.
❒ Determine if there is potential for environmental damage.
❒ Evaluate which government agencies have jurisdiction inside the planning and response zones.
❒ Assess weather conditions. Determine if they could impact emergency response efforts.

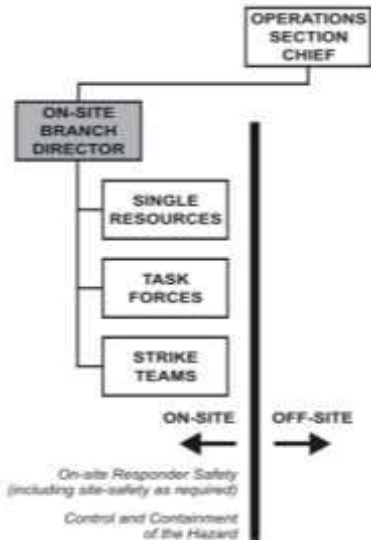
- ❒ In order to maintain an effective span of control (no more than seven responders reporting to one supervisor), proactively mobilize the following:
  - ❒ Public Protection Branch Director
  - ❒ On-site Branch Director
  - ❒ Other Branch Director(s), as required
- ❒ Supervise the On-site Branch Director to:
  - ❒ Prepare an on-site responder safety action plan.
  - ❒ Prepare an emergency control and containment action plan.
- ❒ Supervise the Public Protection Branch Director to:
  - ❒ Prepare a planning zone and a response zones' responder safety action plan.
  - ❒ Prepare a planning zone and a response zones' public protection measure action plan. Ensure the appropriate Provincial and/or Regulatory Section public protection measures for the planning zone and the response zones are carried out.
- ❒ Supervise the other Branch Director(s) to:
  - ❒ Prepare a responder safety action plan.
  - ❒ Prepare the required action plan (recovery, wildlife, etc.).

- ❒ If required, dispatch and supervise a Staging Area Manager.
- ❒ Implement the tactical portion of the overall Incident Action Plan (IAP).
- ❒ Participate in Incident Management Team (IMT) briefings.
- ❒ Schedule and conduct frequent Operations Section briefings.
- ❒ As required, obtain medical response personnel. Ensure they are aware of any potential hazards.
- ❒ Evaluate the need for additional on-site, planning zone and response zones response team personnel.
- ❒ In conjunction with the On-site Branch Director, Review Tervita's ignition guidelines (Refer to Section 5.0, Ignition for ignition equipment and procedures and the appropriate Provincial and/or Regulatory for specific ignition criteria). The decision-making authority to ignite must be assigned to an on-site Tervita representative.
- ❒ If any ignition criteria are met, ensure Tervita ignites the release. Ignition does not negate the need for continuing with evacuation as there could be residual pockets of H_2S or SO_2 in the area.

Postincident Duties

- ❒ Implement the tactical portion of the Postincident Action Plan.
- ❒ Coordinate and carry out an Operations Section Postincident Debrief.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Gather all data related to the response from those you supervise and forward to the Planning Section Chief.

4.8 ON-SITE BRANCH DIRECTOR

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Role	Supervises activities at the site of the incident to maximize on-site responder safety and control and containment of the hazard.	
Located at	On-site Command Post (OSCP) (incident site)	
Supervises Activities of	On-site responders and on-site contract services	
Reports to/ Assigned by	Operations Section Chief	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	

Information Exchange (Informal Communication)	Open to responders to freely exchange information.
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.
Single Resources	Single Resources include both personnel and their required equipment (e.g. On-site Safety)
Task Forces	A Task Force is a combination of <u>different</u> types and kinds of single resources assembled for a particular tactical need, with common communications and a leader (e.g. Well Control Task Force). Task forces can be pre-determined or assembled at an incident from available single resources. Span of control guidelines apply.
Strike Teams	A Strike Team is a combination of the <u>same</u> types and kinds of single resources assembled for a particular tactical need, with common communications and a leader (e.g. Fire Fighting Task Force). Strike teams can be pre-determined or assembled at an incident from available single resources. Span of control guidelines apply.

Incident Investigation, Alerts and Minor Incidents

- ❒ If on-site; follow the Initial On-site Actions – 7 Steps.
- ❒ If sent to incident site to investigate:
  - ❒ Proceed with caution. If required, wait for backup personnel - the "buddy system".
  - ❒ Approach from an upwind or crosswind direction.
  - ❒ Assume there is danger! Resist the urge to rush in, inspect the site from a distance.
  - ❒ As required, check for any escaping gas/hydrocarbon.

- ❒ Confirm that you and all on-site responders are appropriately trained, accredited and have personal protective equipment (PPE). Personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- ❒ Carry out a site assessment that includes the following activities:
  - ❒ Identify hazardous materials.
  - ❒ Evaluate the risk to responders.
  - ❒ Evaluate the risk to the public.
  - ❒ Evaluate the risk to the environment.
  - ❒ Determine the potential for the incident to escalate.
  - ❒ Identify safety concerns. Do not enter a suspected HVP/NGL/LPG or H_2S environment alone, without proper training or without proper safety equipment, including SCBA and personal electronic H_2S/SO_2 gas detectors.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Confirm the alert, minor incident or level of emergency with your supervisor.
- ❒ As required, request additional on-site resources (manpower and equipment).

Level One, Two or Three Emergency

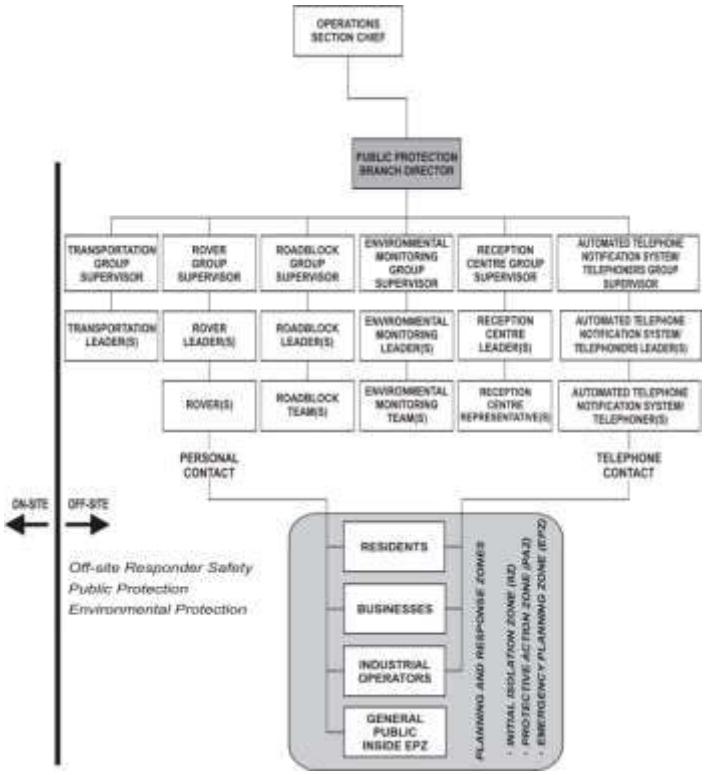
- ❒ Receive a briefing from your supervisor.
- ❒ Define the on-site work areas. Refer to Section 2.0, On-site Work Areas.
- ❒ Refer to Section 6.0, Incident-Specific Response Actions.
- ❒ Establish an On-site Command Post (OSCP) in the Safe Area near the incident. If communication fails between any incident facility, you have the authority to make decisions on Tervita's behalf. This includes ignition decisions.
- ❒ Ensure all on-site personnel have appropriate training, accreditation and personal protective equipment (PPE). Personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- ❒ Clear nonessential personnel from the incident site.
- ❒ Ensure all on-site personnel follow the appropriate safe-work procedures.
- ❒ Assess the need for on-site safety supervision.
- ❒ With your supervisor develop and/or review the on-site responder safety and control and containment action plan.
- ❒ Supervise on-site control and containment activities.
- ❒ With the assistance of your supervisor, procure the necessary on-site safety supervision, medical response and additional on-site equipment and personnel. Ensure they are aware of any potential hazards.
- ❒ Participate in Operations Section briefings.

- ❒ Review ignition guidelines. Refer to:
  - ❒ Section 5.0, Ignition for ignition equipment and procedures.
  - ❒ The appropriate Provincial and/or Regulatory for specific ignition criteria.
- ❒ Commence ignition if any of the ignition criteria are met.

Postincident Duties

- ❒ Ensure all on-site personnel are promptly notified.
- ❒ The incident site is not to be disturbed until all necessary site investigations have been completed by government or company representatives.
- ❒ Initiate and coordinate on-site postincident duties.
- ❒ Ensure on-site all responders do not work alone on cleanup operations.
- ❒ Ensure on-site all responders are decontaminated before they leave the incident site.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Gather all on-site response data and forward to your supervisor.

4.9 PUBLIC PROTECTION BRANCH DIRECTOR

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Role	Supervises planning and response zone (except for the incident site), responder safety and public protection measures to maximize public protection.	
Located at	Incident Command Post (ICP) or Remote Command Post (RCP) (if established)	
Supervises Activities of	Transportation Group Supervisor or Transportation Leader(s)	
	Rover Group Supervisor, Rover Leader(s) or Rover(s)	
	Roadblock Group Supervisor, Roadblock Leader(s) or Roadblock Team(s)	
	Environmental Monitoring Group Supervisor, Environmental Monitoring Leader(s) or Environmental Monitoring Team(s)	
	Reception Centre Group Supervisor, Reception Centre Leader(s) or Reception Centre Representative(s)	
	Telephoner Group Supervisor, Telephoner Leader(s) or Telephoner(s)	
Reports to/ Assigned by	Operations Section Chief	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	
Public Protection Group Tables (Tables located later in this Section.)	Public Protection Group Tables have been created to assist with various public protection measures inside the planning and response zones and beyond. Ensure the appropriate public protection measures for the planning and response zones are carried out for the specific level of emergency. Refer to the appropriate Provincial and/or Regulatory section.	

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

The "complexity" of public protection measures depends on the type of emergency: e.g. H_2S or HVP, the size of; and the amount of public activity inside; the planning zone and the response zones.

❒ Receive a briefing from your supervisor.

- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Refer to appropriate Provincial and/or Regulatory section for specific public protection measure requirements.
- ❒ Ensure a Complexity Analysis is performed for any planning zone or response zone:

Complexity Analysis Factors
❒ Evaluate how many members of the public could be inside the planning zone and the response zones. Account for residents, businesses, First Nations persons, trappers, guide/outfitters, grazing lessees, transients, waterways, rail lines, etc.
❒ Determine if there are roads and how many lead into the planning zone and the response zones. ❒ Starting at "12-noon" number each planning zone and response zone Roadblock Location with a separate numbering system, each starting with the number "1". ❒ Divide the planning zone and the response zones into manageable Rover Areas. ❒ Starting with the letter "A", labeling each Rover Area with a letter. The response zone closest to the incident site should be labeled Rover Area "A".
❒ Assess weather conditions. Determine if they could impact emergency response efforts.

- ❒ Work with your supervisor to:
  - ❒ Prepare a planning zone and a response zones' responder safety action plan.
  - ❒ Prepare a planning zone and a response zones' public protection measure action plan.
- ❒ In order to maintain an effective span of control (no more than seven responders reporting to one supervisor), proactively mobilize the following:
  - ❒ Transportation Group Supervisor or Transportation Leader(s)
  - ❒ Environmental Monitoring Group Supervisor or Environmental Monitoring Leader(s)
  - ❒ Rover Group Supervisor or Rover Leader(s)
  - ❒ Reception Centre Group Supervisor or Reception Centre Leader(s)
  - ❒ Roadblock Group Supervisor or Roadblock Leader(s)
  - ❒ Telephoner Group Supervisor or Telephoner Group Leader(s)
- ❒ Ensure the required public transportation vehicles (Evacuation Buses) have been mobilized.
- ❒ Ensure the required number of Rover(s) have been mobilized.
- ❒ Ensure the required number of Roadblock Team(s) have been mobilized.
- ❒ Develop an environmental monitoring strategy. If the emergency involves H_2S or HVP, ensure an appropriate air monitoring strategy is employed.

Air Quality Monitoring
Air quality monitoring is used for tracking and recording the presence and concentrations of H_2S during a sour gas release and SO_2 following the ignition of the release or the presence and lower explosive limit (LEL) levels of HVP product following a release.
Air quality monitoring equipment is used to: • track the plume, • determine if ignition concentration criteria are met, • determine whether evacuation and/or Shelter-In-Place concentration criteria have been met,

Air Quality Monitoring
• assist in determining when the emergency status can be downgraded, • determine Roadblock locations, and • determine concentrations in areas being evacuated to ensure that evacuation is safe.
The type of air monitoring units and the number of monitors required are based on site-specific information, including: • access and egress points, • population density and proximity to urban density developments, and • local conditions.
For an Emergency Planning Zone (EPZ) that includes a portion of an urban density development or urban centre, there must be a minimum of two mobile air quality monitors: • one to monitor the boundary of the urban density development or urban centre and • the other to track the plume.
For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or area where people may be present.
For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.
Tervita will be prepared to provide the above details on the intended use and procedures surrounding the activation of air quality monitoring equipment, such as stationary and mobile air quality monitoring units and personal handheld monitors during its response.
Tervita will provide monitored information to the petroleum regulatory agency; the local authority; the local health region/authority; the provincial environment authority and on request to the public on a regular basis throughout an emergency.

- ❒ As required, ensure a Reception Centre is activated to receive evacuees.
- ❒ Ensure Telephoner activities are activated.
- ❒ Ensure the public outside any planning or response zone, who may perceive themselves to be at risk, are informed about the emergency.
- ❒ Participate in Operations Section briefings.
- ❒ Schedule and conduct frequent Public Protection Group briefings.

Public Protection Branch Tables

It is Tervita's responsibility to initiate public protection measures inside a specific planning and response zone for any incident involving H_2S or HVP product when there is potential for the release to impact members of the public. This could also include SO_2 if the H_2S release was ignited.

The following tables have been created to assist with various public protections measures inside a specific planning and response zone.

Table Name
Transportation Group (Shelter-In-Place, Evacuation and Notification).
Rover Group (Shelter-In-Place, Evacuation and Notification).
Roadblock Group (Shelter-In-Place, Evacuation and Notification).
Environmental Monitoring Group (Shelter-In-Place, Evacuation and Notification).
Reception Centre Group (Shelter-In-Place, Evacuation and Notification).
Telephoner Group (Shelter-In-Place, Evacuation and Notification).

Transportation Group

Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) (including communication equipment) before they are dispatched.

Shelter-In-Place (Transportation Group)

- ❒ The need to place public transportation vehicles (Evacuation Buses) on standby will be assessed or the required public transportation vehicles (Evacuation Buses) will be mobilized to the edge of the Emergency Planning Zone (EPZ).
- ❒ If required, a Rover will be mobilized to accompany each Evacuation Bus.

Evacuation (Transportation Group)

- ❒ The need to place public transportation vehicles (Evacuation Buses) on standby will be assessed or the required public transportation vehicles (Evacuation Buses) will be mobilized to the edge of the Emergency Planning Zone (EPZ).
- ❒ If required, a Rover will be mobilized to accompany each Evacuation Bus.

Notification (Transportation Group)

- ❒ The need to place public transportation vehicles (Evacuation Buses) on standby will be assessed or the required public transportation vehicles (Evacuation Buses) have been mobilized to the edge of the Emergency Planning Zone (EPZ).
- ❒ If required, a Rover will be mobilized to accompany each Evacuation Bus.

Rover Group

Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) (including communication equipment) before they are dispatched.

Shelter-In-Place (Rover Group)

- ❒ The required number of Rovers will be mobilized to the specific planning and response zone. Each Rover will be assigned a specific Rover Area. If safe to do so, each Rover will be dispatched to their assigned Rover Area or if unsafe placed on standby at a safe location.
- ❒ Each Rover will find their assigned Rover Area and establish communication with their supervisor.
- ❒ If safe to do so, each Rover will take regular air quality readings and record results on an **Environmental Monitoring Record**.

NOTES: **For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.**

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

- ❒ The need to mobilize a helicopter and Helicopter Rover will be assessed.
- ❒ If required, a Rover will be mobilized to accompany each Evacuation Bus.

Evacuation (Rover Group)

- ❒ The required number of Rovers will be mobilized to the specific planning and response zone. As required, each Rover will be assigned a Rover Area. Rovers will be dispatched to their assigned Rover Area.
- ❒ Each Rover will find their assigned Rover Area and establish communication with their supervisor.
- ❒ Each Rover will advise any member of the public inside their Rover Area to evacuate and give them a **Public Evacuation Notice.**
- ❒ As required, each Rover provides evacuation assistance.
- ❒ Each Rover will maintain a record of public contact on a **Public Notification Record**.
- ❒ Each Rover will post a **Public Evacuation Notice** on all doors of each residence and business, on each outbuilding and the windshield of each unattended vehicle.
- ❒ Each Rover will maintain security at evacuated residences/businesses and other property inside their Rover Area.
- ❒ Each Rover will take regular air quality readings and record results on an **Environmental Monitoring Record**.

NOTES: **For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.**

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

- ❒ The need to mobilize a helicopter and Helicopter Rover will be assessed.
- ❒ If required, a Rover will be mobilized to accompany each Evacuation Bus.

Notification (Rover Group)

- ❒ The required number of Rovers will be mobilized to the specific planning and response zone. As required, each Rover will be assigned a Rover Area. Rovers will be dispatched to their assigned Rover Area.
- ❒ Each Rover will find their assigned Rover Area, and establish communication with their supervisor.
- ❒ Each Rover will advise any member of the public inside their Rover Area to voluntarily evacuate and give them a **Public Information Notice**.
- ❒ As required, each Rover provides voluntary evacuation assistance.
- ❒ Each Rover will maintain a record of public contact on a **Public Notification Record**.
- ❒ Each Rover will post a **Public Information Notice** on all doors of each residence and business, on each outbuilding and the windshield of each unattended vehicle.
- ❒ Each Rover will maintain security at voluntarily evacuated residences/businesses and other property inside their Rover Area.
- ❒ Each Rover will take regular air quality readings and record results on an **Environmental Monitoring Record**.

NOTES: **For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.**

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

- ❒ The need to place on standby or mobilize a helicopter and Helicopter Rover will be assessed.
- ❒ If required, a Rover will be mobilized to accompany each Evacuation Bus.

Roadblock Group

Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) (including communication equipment) before they are dispatched.

Roadblock Teams will not go back for a Roadblock Kit if one is not nearby. They will arrange to have the Roadblock Kit brought to them.

Shelter-In-Place (Roadblock Group)

- ❒ The required number of Roadblock Teams will be mobilized to the specific planning and response zone.
- ❒ A Roadblock Location will be assigned to each Roadblock Team.
- ❒ Each Roadblock Team will find their assigned Roadblock Location and establish communication with their supervisor.

NOTE: Each Roadblock Team will be established outside their assigned planning and response zone Roadblock Location. Roadblocks should be placed in locations that are clearly visible to oncoming traffic. They must be positioned to enable traffic to turn around safely and quickly. Intersections are usually good locations for Roadblocks.

- ❒ Each Roadblock Team will advise the public not to enter their respective planning and response zone.
- ❒ Each Roadblock Team will document public contact, including public exiting a planning and response zone, on a **Roadblock Checkpoint Record**.
- ❒ Each Roadblock Team will document on a **Roadblock Checkpoint Record** authorized personnel entering their planning and response zone.

NOTE: If unauthorized members of the public enter a planning and response zone, the Roadblock Team will document vehicle description and licence number and communicate the situation to their supervisor.

- ❒ Each Roadblock Team will take regular air quality readings and record results on an **Environmental Monitoring Record**.

NOTES: For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

Evacuation (Roadblock Group)

- ❒ The required number of Roadblock Teams will be mobilized to the specific planning and response zone.
- ❒ A Roadblock Location will be assigned to each Roadblock Team.
- ❒ Each Roadblock Team will find their assigned Roadblock Location and establish communication with their supervisor.

NOTE: Each Roadblock Team will be established outside their assigned planning and response zone Roadblock Location. Roadblocks should be placed in locations that are clearly visible to oncoming traffic. They must be positioned to enable traffic to turn around safely and quickly. Intersections are usually good locations for Roadblocks.

- ❒ Each Roadblock Team will advise the public not to enter their respective planning and response zone.
- ❒ Each Roadblock Team will document public contact, including public exiting a planning and response zone, on a **Roadblock Checkpoint Record**.
- ❒ Each Roadblock Team will document on a **Roadblock Checkpoint Record** authorized personnel entering their planning and response zone.

NOTE: If unauthorized members of the public enter a planning and response zone, the Roadblock Team will document vehicle description and licence number and communicate the situation to their supervisor.

- ❒ Each Roadblock Team will take regular air quality readings and record results on an **Environmental Monitoring Record**.

NOTES: For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

Notification (Roadblock Group)

- ❒ Evaluate the greatest potential Roadblock requirements for the specific planning and response zones.
- ❒ The required number of Roadblock Teams will be mobilized to the Staging Area.
- ❒ A Roadblock Location will be assigned to each Roadblock Team.
- ❒ Each Roadblock Team will be placed standby.

Environmental Monitoring Group

Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) (including communication equipment) before they are dispatched.

Shelter-In-Place (Environmental Monitoring Group)

- ❒ If the emergency involves H_2S or HVP, an appropriate air monitoring strategy will be employed. Refer to the Air Quality Table listed under the duties for the Public Protection Branch Director.
- ❒ The required number of Environmental Monitoring Teams will be mobilized to the specific planning and response zone.

NOTES: For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

- ❒ If safe to do so, an Environmental Monitoring Team will be dispatched to the appropriate planning and response zone.
- ❒ If safe to do so, each Environmental Monitoring Team will take regular air quality readings and record results on an **Environmental Monitoring Record**.

Evacuation (Environmental Monitoring Group)

- ❒ If the emergency involves H_2S or HVP, an appropriate air monitoring strategy will be employed. Refer to the Air Quality Table listed under the duties for the Public Protection Branch Director.
- ❒ The required number of Environmental Monitoring Teams will be mobilized to the appropriate planning and response zone.

NOTES: For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

- ❒ An Environmental Monitoring Team will be dispatched to the appropriate planning and response zone.
- ❒ Each Environmental Monitoring Team will take regular air quality readings and record results on an **Environmental Monitoring Record**.

Notification (Environmental Monitoring Group)

- ❒ If the emergency involves H_2S or HVP, an appropriate air monitoring strategy will be employed. Refer to the Air Quality Table listed under the duties for the Public Protection Branch Director.
- ❒ The required number of Environmental Monitoring Teams will be mobilized to the appropriate planning and response zone.

NOTES: For an emergency involving H_2S, air quality monitoring must occur downwind, with priority being directed to the nearest unevacuated residence or areas where people may be present.

For an emergency involving HVP, air quality monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present. Visual monitoring may also be used for HVP emergencies.

- ❒ An Environmental Monitoring Team will be dispatched to the appropriate planning and response zone.
- ❒ Each Environmental Monitoring Team will take regular air quality readings and record results on an **Environmental Monitoring Record**.

Reception Centre Group

Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) (including communication equipment) before they are dispatched.

Shelter-In-Place (Reception Centre Group)

- ❒ The required number of Reception Centre personnel will be mobilized.
- ❒ The Reception Centre personnel will be dispatched to the Reception Centre using a safe route. Once the Reception Centre personnel have arrived at the Reception Centre, they will establish communication with their supervisor.
- ❒ The Reception Centre personnel will:
  - ❒ Open the Reception Centre.
  - ❒ Confirm the availability of lodging for possible evacuees.
  - ❒ Be prepared to receive evacuees.
  - ❒ Receive the evacuees and maintain an **Evacuee Registration Record**.
  - ❒ Evacuees should not have to pay for out-of pocket expenses. Provide evacuees with an **Expense Claim Form**.
  - ❒ Arrange accommodations for the evacuees.
  - ❒ Receive school children who live inside the appropriate planning and response zone and whose School Buses has been redirected to the Reception Centre. As school children arrive at the Reception Centre, document particulars on the **School Children Registration Record**. Children will be supervised until they can be picked up by their parents or guardians.
  - ❒ As requested, arrange for the temporary care/security of evacuated property and livestock.
  - ❒ Assist the evacuees as required.

Evacuation (Reception Centre Group)

- ❒ The required number of Reception Centre personnel will be mobilized.
- ❒ The Reception Centre personnel will be dispatched to the Reception Centre using a safe route. Once the Reception Centre personnel have arrived at the Reception Centre, they will establish communication with their supervisor.
- ❒ The Reception Centre personnel will:
  - ❒ Open the Reception Centre.
  - ❒ Confirm the availability of lodging for possible evacuees.
  - ❒ Be prepared to receive evacuees.
  - ❒ Receive the evacuees and maintain an **Evacuee Registration Record**.
  - ❒ Evacuees should not have to pay for out-of pocket expenses. Provide evacuees with an **Expense Claim Form**.
  - ❒ Arrange accommodations for the evacuees.
  - ❒ Receive school children who live inside the appropriate planning and response zone and whose School Buses have been redirected to the Reception Centre. As school children arrive at the Reception Centre, document particulars on the **School Children Registration Record**. Children will be supervised until they can be picked up by their parents or guardians.
  - ❒ As requested, arrange for the temporary care/security of evacuated property and livestock.
  - ❒ Assist the evacuees as required.

Notification (Reception Centre Group)

- ❒ The required number of Reception Centre personnel will be mobilized.
- ❒ The Reception Centre personnel will be dispatched to the Reception Centre using a safe route. Once the Reception Centre personnel have arrived at the Reception Centre, they will establish communication with their supervisor.
- ❒ The Reception Centre personnel will:
  - ❒ Open the Reception Centre.
  - ❒ Confirm the availability of lodging for possible voluntary evacuees.
  - ❒ Be prepared to receive voluntary evacuees.
  - ❒ Receive the voluntary evacuees and maintain an **Evacuee Registration Record**.
  - ❒ Voluntary evacuees should not have to pay for out-of pocket expenses. Provide voluntary evacuees with an **Expense Claim Form**.
  - ❒ Arrange accommodations for the voluntary evacuees.
  - ❒ Receive school children who live inside the appropriate planning and response zone and whose School Buses have been redirected to the Reception Centre. As school children arrive at the Reception Centre, document particulars on the **School Children Registration Record**. Children will be supervised until they can be picked up by their parents or guardians.
  - ❒ As requested, arrange for the temporary care/security of evacuated property and livestock.
  - ❒ Assist the voluntary evacuees as required.

Telephoner Group

Confirm all responders are trained, accredited and have the appropriate personal protective equipment (PPE) (including communication equipment) before they are dispatched.

Shelter-In-Place (Telephoner Group)

- ❒ If **NOT** using an automated telephone notification system to assist in the response:
  - ❒ The required number of Telephoners will be mobilized.
  - ❒ Each Telephoner will call their assigned contacts and recite the **SHELTER-IN-PLACE MESSAGE**.
  - ❒ If there are school children residing inside a specific planning and response zone the Telephoners will contact schools (if school is in session) and school bus authorities.
  - ❒ If there are industrial operators, grazing lessees or trappers inside a specific planning and response zone, the Telephoners will contact these industrial operators, grazing lessees or trappers and recite the **EVACUATION MESSAGE**.
- ❒ If using an automated telephone notification system to assist in the response:
  - ❒ The automated telephone notification system personnel will be contacted. Confirm they are prepared to launch the **SHELTER-IN-PLACE MESSAGE** to the desired contacts.
  - ❒ The required number of Telephoners will also be mobilized.
  - ❒ Telephoners will back up the automated telephone notification system and be prepared to answer questions from the public.
  - ❒ The automated telephone notification system personnel will be instructed to send the **SHELTER-IN-PLACE MESSAGE** to the desired contacts.
  - ❒ If there are school children residing inside a specific planning and response zone], the Telephoners will contact schools (if school is in session) and school bus authorities. (This contact is **not** made by the automated telephone notification system.)
  - ❒ If there are industrial operators, grazing lessees or trappers inside a specific planning and response zone, Telephoners will contact these industrial operators, grazing lessees or trappers and recite the **EVACUATION MESSAGE**. (This contact is **not** made by the automated telephone notification system.)

Evacuation (Telephoner Group)

- ❒ If **NOT** using an automated **telephone notification system** to assist in the response:
  - ❒ The required number of Telephoners will be mobilized.
  - ❒ Each Telephoner will call their assigned contacts and recite the **EVACUATION MESSAGE.**
  - ❒ If there are school children residing inside a specific planning and response zone the Telephoners will contact schools (if school is in session) and School Bus authorities.
- ❒ If there are industrial operators, grazing lessees or trappers inside a specific planning and response zone, the Telephoners will contact these industrial operators, grazing lessees or trappers and recite the **EVACUATION MESSAGE**.
- ❒ If using an automated telephone notification system to assist in the response:
  - ❒ The automated telephone notification system personnel will be contacted. Confirm they are prepared to launch the **EVACUATION MESSAGE** to the desired contacts.
  - ❒ The automated telephone notification system personnel will be given the name of the Reception Centre (if required).
  - ❒ The automated telephone notification system personnel will be instructed to insert the name of the Reception Centre into the **EVACUATION MESSAGE**. If a Reception Centre is not required, the automated telephone notification system personnel will be instructed to remove the two sentences referring to the Reception Centre from the **EVACUATION MESSAGE**.
  - ❒ The required number of Telephoners will also be mobilized. Telephoners will back up the automated telephone notification system and be prepared to answer questions from the public.
  - ❒ The automated telephone notification system personnel will send the **EVACUATION MESSAGE** to the desired contacts.
  - ❒ If there are school children residing inside a specific planning and response zone, the Telephoners will be instructed to contact schools (if school is in session) and School Bus authorities. (This contact is **not** made by the automated telephone notification system.)
  - ❒ If there are industrial operators, grazing lessees or trappers inside a specific planning and response zone, the Telephoners will contact these industrial operators, grazing lessees or trappers and recite the **EVACUATION MESSAGE**. (This contact is **not** made by the automated telephone notification system.)

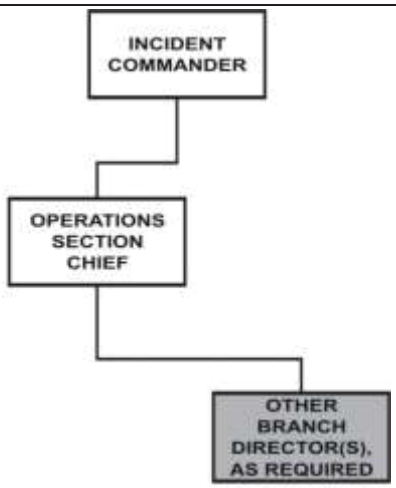
Notification (Telephoner Group)

- ❒ If **NOT** using an automated **telephone notification system** to assist in the response:
  - ❒ The required number of Telephoners will be mobilized.
  - ❒ Each Telephoner will call their assigned contacts and recite the **NOTIFICATION MESSAGE**.
  - ❒ If there are school children inside a specific planning and response zone no contact is required at this time.
- ❒ If there are industrial operators, grazing lessees or trappers inside a specific planning and response zone, the Telephoners will contact these industrial operators, grazing lessees or trappers and recite the **NOTIFICATION MESSAGE.**
- ❒ If using an automated telephone notification system to assist in the response:
  - ❒ The automated telephone notification system personnel will be contacted. Confirm they are prepared to launch the **NOTIFICATION MESSAGE** to the desired contacts.
  - ❒ The automated telephone notification system personnel will be given the name of the Reception Centre (if required).
  - ❒ The automated telephone notification system personnel will be instructed to insert the name of the Reception Centre into the **NOTIFICATION MESSAGE**. If a Reception Centre is not required, the automated telephone notification system personnel will be instructed to remove the two sentences referring to the Reception Centre from the **NOTIFICATION MESSAGE.**
  - ❒ The required number of Telephoners will be mobilized. Telephoners will back up the automated telephone notification system and be prepared to answer questions from the public.
  - ❒ The automated telephone notification system personnel will be instructed to send the **NOTIFICATION MESSAGE** to the desired contacts.
  - ❒ If there are school children residing inside a specific planning and response zone no contact is required at this time.
  - ❒ If there are industrial operators, grazing lessees or trappers inside a specific planning and response zone, the Telephoners will contact these industrial operators, grazing lessees or trappers and recite the **NOTIFICATION MESSAGE**. (This contact is **not** made by the automated telephone notification system.)

Postincident Duties

- ❒ Review the postincident public protection measure responder safety action plan with your supervisor.
- ❒ Recall of Evacuees:
  - ❒ Ensure members of the public who have been affected by the emergency are contacted at the contact numbers provided at the time of evacuation.
  - ❒ Structures inside the Emergency Planning Zone (EPZ) will be monitored for any readings of hazardous substance, such as H_2S, prior to letting evacuees back in the area.
  - ❒ Roadblocks will be maintained until all residents and occupied industrial operator facilities have returned. Roadblock positions may be appropriately modified as people return to the area.
  - ❒ Assistance will be provided to people who need help to return.
  - ❒ All Public Evacuation Notices will be recovered.
  - ❒ The Reception Centre, if established, will be kept open until all of the evacuated public has been advised of the stand-down
  - ❒ Any commitments made to any public or agencies will be followed up
  - ❒ Public expense claims will be collected and processed.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Gather public protection response data and forward to your supervisor.

4.10 OTHER BRANCH DIRECTOR(S), AS REQUIRED

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Role	Supervises incident specific operational tactics not covered by the On-site Branch Director or the Public Protection Branch Director.	
Located at	Incident Command Post (ICP) or Remote Command Post (RCP) (if established)	
Supervises Activities of	Recovery Group Supervisor or Recovery Leader(s)	
	Wildlife Group Supervisor or Wildlife Leader(s)	
	Other Group Supervisor(s) or Leader(s), as required	
Reports to/ Assigned by	Operations Section Chief	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

❒ Receive a briefing from your supervisor.

❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.

❒ Ensure a Complexity Analysis is performed for operational tactics not covered by the On-site Branch Director or the Public Protection Branch Director such as the environment, wildlife, etc.:

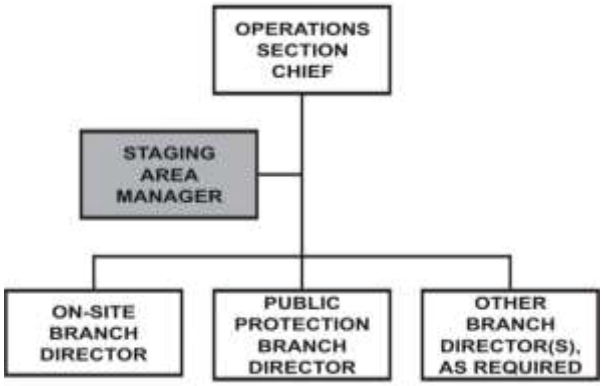
Complexity Analysis Factors
❒ Determine if there is potential for environmental damage.
❒ Determine if there is potential for impact to local wildlife.
❒ Determine if there are impacts to other features not covered by the On-site Branch Director or the Public Protection Branch Director.
❒ Assess weather conditions. Determine if they could impact emergency response efforts.

- ❒ Work with your supervisor to:
  - ❒ Prepare a responder safety action plan.
  - ❒ Prepare the required action plan (recovery, wildlife, etc.).
- ❒ In order to maintain an effective span of control (no more than seven responders reporting to one supervisor), proactively mobilize the required Supervisor(s) or Leader(s).
- ❒ Participate in Operations Section briefings.
- ❒ Schedule and conduct frequent other Operational Group briefings.

Postincident Duties

- ❒ Review the postincident responder safety action plan for other Operational Groups with your supervisor.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Gather other Operational Group response data and forward to your supervisor.

4.11 STAGING AREA MANAGER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Ensures all responders mobilized to the Staging Area are trained, accredited and have the appropriate personal protective equipment (PPE) before. Oversees the movement of available resources (manpower and equipment) to and from the Staging Area.	
Located at	Staging Area	
Supervises Activities of	Available resources (manpower and equipment) at the Staging Area.	
Reports to/ Assigned by	Operations Section Chief	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

❒ Receive a briefing from your supervisor.

❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.

❒ Establish a Staging Area, outside any planning or response zone, near the incident site.

❒ The following criteria are helpful for choosing a suitable Staging Area location.

- ❒ Is the area located outside any planning or response zone?
- ❒ Has approval been received from the landowner to use the site?
- ❒ Is the area easy to find?
- ❒ Is the size of the area adequate not only for equipment, but worker safety?
- ❒ Is the area level and stable?
- ❒ Are the access roads suitable for travel in adverse weather?
- ❒ Are there any entry problems such as narrow approaches, gates, overhead power lines, buried pipelines, etc.?
- ❒ Is communication reception adequate?

❒ As required, erect directional signs to the Staging Area.

- ❒ As required, flag the perimeter of the Staging Area.
- ❒ Advise your supervisor about the “directions to” the Staging Area.
- ❒ As required, obtain an office trailer, lighting, portable toilets, etc. for the Staging Area.
- ❒ Ensure all responders mobilized to the Staging Area are trained, accredited and have the appropriate personal protective equipment (PPE).
- ❒ Oversees the movement of available resources (manpower and equipment) to and from the Staging Area.
- ❒ Participate in Operations Section briefings.

Postincident Duties

- ❒ Notify all responders at the Staging Area.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all Staging Area data to your supervisor.

4.12 PLANNING SECTION CHIEF AND PLANNING SECTION

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Compiles the Incident Objectives form (ICS Form 202), the Incident Briefing form (ICS Form 201) and the overall Incident Action Plan (IAP). Ensures incident information is documented, current, accurate and disseminated.	
Located at	Incident Command Post (ICP)	
Supervises Activities of	Resources Unit	
	Situation Unit	
	Documentation Unit	
	Demobilization Unit	
	Technical Specialists	
Reports to/ Assigned by	Incident Commander	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

❒ Receive a briefing from your supervisor.

❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.

❒ Complete the following:

- ❒ **Incident Objectives** form **(ICS Form 202) -** Have it approved by the Incident Commander.
- ❒ **Incident Briefing** form **(ICS Form 201)**.
- ❒ **Issues Board**
- ❒ **Status Board**

❒ Compile the overall Incident Action Plan (IAP). Ensure the Incident Action Plan (IAP) is reviewed by the Safety Officer (if established) and approved by the Incident Commander. Distribute the Incident Action Plan (IAP) to the Incident Management Team (IMT).

❒ As required, mobilize a deputy.

❒ Post and maintain charts, plot plans, surveys, maps and sketches as they are developed.

- ❒ Ensure incident information is documented, current, accurate and disseminated to the Incident Management Team (IMT).
- ❒ As required, develop a group email to ensure responders are informed in a timely fashion. Group emails will not be relied upon as the primary communications method.
- ❒ As required, mobilize technical specialists (engineering, plume dispersion, environmental, well control, metal fatigue, etc.).
- ❒ Ensure Incident Management Team (IMT) members are documenting their actions, decisions, contacts and requests on:
  - ❒ **Activity Log (ICS Form 214)** - all responders
  - ❒ **Public Notification Record** - Rovers and Telephoners
  - ❒ **Roadblock Checkpoint Record** - Roadblock Teams
  - ❒ **Environmental Monitoring Record** - Environmental Monitoring Teams, Rovers and Roadblock Teams
  - ❒ **Evacuee Registration Record and School Children Registration Record** - Reception Centre Group Leader, Reception Centre Managers and Reception Centre Representatives
- ❒ As required, proactively mobilize a:
  - ❒ **Resources Unit** - responsible for all check-in activity and for documenting the status and location of all resources (manpower and equipment).
  - ❒ **Situation Unit** - develops maps, collects and processes information about the current situation, prepares situation displays and situation summaries and projections. The Situation Unit may mobilize the following single resources: Display Processor, Field Observer or Weather Observer.
  - ❒ **Documentation Unit** - maintains incident-related documentation and provides duplication services.
  - ❒ **Demobilization Unit** - assists in ensuring the orderly, safe and cost-effective demobilization of no longer required response resources (manpower and equipment).

  NOTE: Specific response team duties for the above mentioned units are not included in this emergency response plan other than those listed above.
- ❒ Utilizing a Briefing Form facilitate Incident Management Team (IMT) briefings.

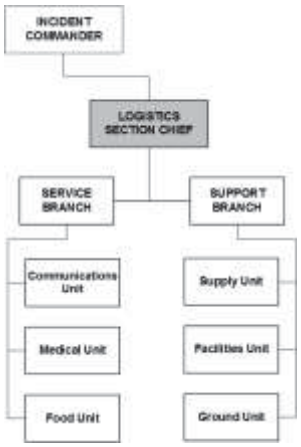
Postincident Duties

- ❒ Compile the overall Postincident Action Plan (IAP).
- ❒ Ensure **Demobilization Checkout** forms **(ICS Form 221)** are utilized.
- ❒ Participate in the Postincident Debrief held by your supervisor.

  Gather all data related to the incident.

4.13 LOGISTICS SECTION CHIEF AND LOGISTICS SECTION

<table>
<tr><td>Primary Objectives</td><td>1. Responder safety
2. Public protection
3. Control and containment of the hazard</td><td>Suggested Primary ICS Positions
(Other positions mobilized as required.)</td></tr>
<tr><td>Roles</td><td>Assists with procuring resources (manpower and equipment).

Ensures responders are trained, accredited and have the appropriate personal protective equipment (PPE) before they are dispatched.</td><td rowspan="9"> 
</td></tr>
<tr><td>Located at</td><td>Incident Command Post (ICP)</td></tr>
<tr><td rowspan="6">Supervises
Activities of</td><td>Communications Unit</td></tr>
<tr><td>Medical Unit</td></tr>
<tr><td>Food Unit</td></tr>
<tr><td>Supply Unit</td></tr>
<tr><td>Facilities Unit</td></tr>
<tr><td>Ground Unit</td></tr>
<tr><td>Reports to/
Assigned by</td><td>Incident Commander</td></tr>
<tr><td>Public Protection Measures</td><td colspan="2">Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).</td></tr>
<tr><td colspan="2">Information Exchange
(Informal Communication)</td><td>Open to responders to freely exchange information.</td></tr>
<tr><td colspan="2">Flow of Orders, Directives, Resource Requests and Status Changes
(Formal Communication)</td><td>Must follow the hierarchy of command (chain of command) unless otherwise directed.</td></tr>
</table>

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ As required, procure the following:
  - ❒ Information technology requirements (communications equipment, computer systems, etc.).
  - ❒ Medical aid for responders.
  - ❒ Incident Facilities support (setting up, security, clerical, etc.).
  - ❒ Supplies, services and equipment [contractors, Western Canadian Spill Services (WCSS) equipment, catering for the responders, etc.].
  - ❒ Personnel [Tervita, mutual aid, Western Canadian Spill Services (WCSS), etc.].
  - ❒ Ground transportation for responders.

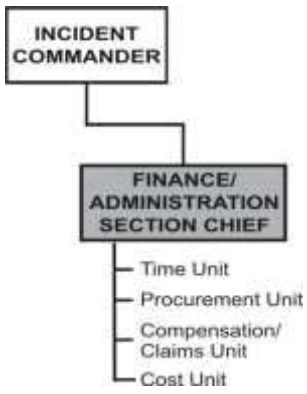
- ❒ As required, mobilize a deputy.
- ❒ Prior to mobilizing a responder, confirm they are trained, accredited and have the appropriate personal protective equipment (PPE). Personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- ❒ As required and as available, mobilize an Area Office Receptionist. Ensure this Receptionist has a copy of the **Incident Briefing** form **(ICS Form 201)** and that she/he knows where to direct incident-related calls.
- ❒ As required, proactively mobilize a Service Branch:
  - ❒ **Communications Unit** - responsible for distributing and maintaining incident communication equipment and computer systems.
  - ❒ **Medical Unit** - develops a medical plan, first aid and medical treatment for responders. May also develop a medical transportation plan (ground/air) and also any medical reports for responders.
  - ❒ **Food Unit** - responsible to supply food and potable water for responders.
- ❒ As required, proactively mobilize a Support Branch:
  - ❒ **Supply Unit** - orders personnel, equipment and supplies. The Supply Unit may mobilize the following single resources: Ordering, Receiving, and/or Distribution Manager.
  - ❒ **Facilities Unit** - sets up and maintains any incident-related facilities. The Facilities Unit may mobilize the following single resource: Security Manager.
  - ❒ **Ground Unit** - provides transportation and fuel for the responders.

  NOTE: Specific response team duties for the above mentioned units are not included in this emergency response plan other than those listed above.
- ❒ Participate in Incident Management Team (IMT) briefings.

Postincident Duties

- ❒ Notify the Area Office Receptionist (if established).
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the incident to the Planning Section Chief.

4.14 FINANCE/ADMINISTRATION SECTION CHIEF AND FINANCE/ADMINISTRATION SECTION

<table>
<tr><td>Primary Objectives</td><td colspan="2">1. Responder safety
2. Public protection
3. Control and containment of the hazard</td><td>Suggested Primary ICS Positions
(Other positions mobilized as required.)</td></tr>
<tr><td>Roles</td><td colspan="2">Provides time tracking, procurement procedures, compensation, claims and cost accounting.</td><td rowspan="6"> 
</td></tr>
<tr><td>Located at</td><td colspan="2">Incident Command Post (ICP)</td></tr>
<tr><td rowspan="4">Supervises
Activities of</td><td>Time Unit</td></tr>
<tr><td>Procurement Unit</td></tr>
<tr><td>Compensation/Claims Unit</td></tr>
<tr><td>Cost Unit</td></tr>
<tr><td>Reports to/ Assigned by</td><td colspan="2">Incident Commander</td></tr>
<tr><td>Public Protection Measures</td><td colspan="3">Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).</td></tr>
<tr><td colspan="2">Information Exchange (Informal Communication)</td><td colspan="2">Open to responders to freely exchange information.</td></tr>
<tr><td colspan="2">Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)</td><td colspan="2">Must follow the hierarchy of command (chain of command) unless otherwise directed.</td></tr>
</table>

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Record active responder time. Inform your supervisor about any excess hours worked.
- ❒ In cooperation with the Logistics Section Chief, ensure all financial matters pertaining to vendor contracts are addressed.
- ❒ As required, mobilize a deputy.
- ❒ Supervise compensation/claim brought forward as a result of the incident.
- ❒ Provide incident cost analysis.
- ❒ As required, proactively mobilize a:
  - ❒ **Time Unit** - ensures active responder time is recorded.
  - ❒ **Procurement Unit** - administers equipment rental and supply contracts. Responsible for equipment time recording.

- ❒ **Compensation/Claims Unit** - oversees responder/worker compensation documentation (injury/illness) is correctly completed and handles the investigation of damage claims.
- ❒ **Cost Unit** - responsible for collecting incident-related cost information and providing cost estimates.

NOTE: Specific response team duties for the above mentioned units are not included in this emergency response plan other than those listed above.

❒ Participate in Incident Management Team (IMT) briefings.

Postincident Duties

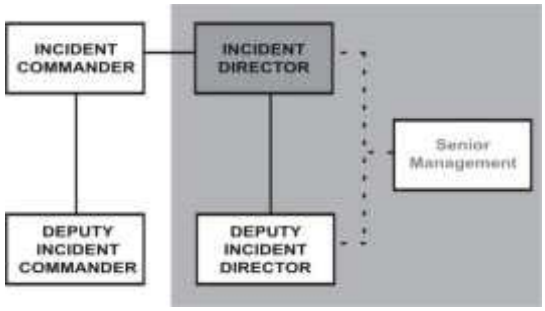
❒ Notify previous contacts.

❒ Participate in the Postincident Debrief held by your supervisor.

❒ Forward all data related to the incident to the Planning Section Chief.

4.15 INCIDENT DIRECTOR

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard		Suggested Primary ICS Positions (Other positions mobilized as required.)
Role	Directs the Incident Support Team (IST) to provide advice and support to the Incident Management Team (IMT).		
Located at	Emergency Operations Centre (EOC)		
Supervises Activities of	Deputy Incident Director	*Assists Incident Director*	
	IST Information Officer	*Interfaces with involved media.*	
	IST Safety Officer	*Advice and support for maximizing responder safety.*	
	IST Liaison Officer	*Advice and support for interfacing with government agencies.*	
	Operations Section Head	*Advice and support for managing tactical operations - "Doers".*	
	Planning Section Head	*Advice and support for compiling action plan/documents response - "Thinkers and Documenters".*	
	Logistics Section Head	*Advice and support for procuring resources - "Getters".*	
	Finance/Administration Section Head	*Advice and support for ensuring cost accounting - "Payers".*	
Obtains Advice and Support from	Senior Management		
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).		
Information Exchange (Informal Communication)	Open to responders to freely exchange information.		
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.		



RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

❒ Chronologically document all action, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.

❒ Refer to the Initial On-site Actions – 7 Steps diagram and Incident Support Team (IST) Response Process (Response P) diagram in Section 1.0. As required, have other Incident Support Team (IST) members refer to these diagrams.

- ❒ From the Incident Commander, receive and review the following:
  - ❒ **Incident Objectives** form **(ICS Form 202)**.
  - ❒ **Incident Briefing** form **(ICS Form 201).**
  - ❒ **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A).**
  - ❒ Completed appropriate Provincial and/or Regulatory Section - emergency reporting form**.**

  NOTE: The Incident Management Team (IMT) may ask the Incident Support Team (IST) to assist them in completing some of these forms.
- ❒ Resist the urge to do all tasks. Delegate responsibilities. Appoint others to carry out Incident Support Team (IST) response functions. **Get Big Fast!**
- ❒ In order to maintain an effective span of control (no more than seven responders reporting to one supervisor), proactively mobilize the following:
  - ❒ Deputy Incident Director
  - ❒ IST Information Officer
  - ❒ IST Safety Officer
  - ❒ IST Liaison Officer
  - ❒ Operations Section Head
  - ❒ Planning Section Head
  - ❒ Logistics Section Head
  - ❒ Finance/Administration Section Head
- ❒ Activate the Emergency Operations Centre (EOC) and confirm there is an adequate communication link to the Incident Command Post (ICP).
- ❒ Advise and support the Incident Management Team (IMT) regarding the:
  - ❒ On-site responder safety action plan.
  - ❒ Planning zone and the response zones responder safety action plan.
  - ❒ Planning zone and the response zones public protection measure action plan.
  - ❒ Air monitoring strategy.
  - ❒ Control and containment action plan.
  - ❒ Overall Incident Action Plan (IAP).
  - ❒ Ignition (Refer to Section 5.0, Ignition for ignition equipment and procedures and the appropriate Provincial and/or Regulatory for specific ignition criteria).
  - ❒ Unified Command.
- ❒ Schedule and conduct frequent Incident Support Team (IST) briefings.

NOTE: The Planning Section Head should facilitate these briefings.

- ❒ Ensure Senior Management is kept informed about the response. As required, obtain advice and support from Senior Management.

Postincident Duties

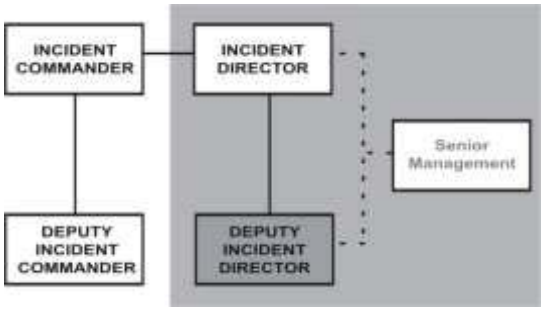
- ❒ Refer to the appropriate provincial and/or regulatory tab for procedures to downgrade or stand-down a level of emergency.
- ❒ Ensure all Incident Support Team (IST) members are notified.
- ❒ Coordinate Incident Support Team (IST) postincident duties.
- ❒ With the Incident Commander, review the overall Postincident Action Plan.
- ❒ If required, procure personnel to conduct Critical Incident Stress Debriefing (CISD).
- ❒ Coordinate and carry out a Postincident Debrief with Incident Support Team (IST) personnel.
- ❒ Forward all data related to the response to the Planning Section Head.

4.16 DEPUTY INCIDENT DIRECTOR

<table>
<tr><td>Primary Objectives</td><td colspan="2">1. Responder safety
2. Public protection
3. Control and containment of the hazard</td><td>Suggested Primary ICS Positions
(Other positions mobilized as required.)</td></tr>
<tr><td>Roles</td><td colspan="2">Assists the Incident Director in advising and supporting the Incident Management Team (IMT).

Fills one or more IST Command Staff functions until these functions are assigned.

Helps to set up the Emergency Operations Centre (EOC).

As required, communicates with the Incident Commander or Deputy Incident Commander.</td><td rowspan="10"> 
</td></tr>
<tr><td>Located at</td><td colspan="2">Emergency Operations Centre (EOC)</td></tr>
<tr><td rowspan="8">May Assist in Supervising the Activities of</td><td>IST Information Officer</td><td>Interfaces with involved media.</td></tr>
<tr><td>IST Safety Officer</td><td>Advice and support for maximizing responder safety.</td></tr>
<tr><td>IST Liaison Officer</td><td>Advice and support for interfacing with government agencies.</td></tr>
<tr><td>Operations Section Head</td><td>Advice and support for managing tactical operations - “Doers”.</td></tr>
<tr><td>Planning Section Head</td><td>Advice and support for compiling action plan/documents response - “Thinkers and Documenters”.</td></tr>
<tr><td>Logistics Section Head</td><td>Advice and support for procuring resources - “Getters”.</td></tr>
<tr><td>Finance/Administration Section Head</td><td>Advice and support for ensuring cost accounting - “Payers”.</td></tr>
<tr><td>Obtains Advice and Support from</td><td colspan="2">Senior Management</td></tr>
<tr><td>Public Protection Measures</td><td colspan="3">Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).</td></tr>
<tr><td colspan="2">Information Exchange (Informal Communication)</td><td colspan="2">Open to responders to freely exchange information.</td></tr>
<tr><td colspan="2">Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)</td><td colspan="2">Must follow the hierarchy of command (chain of command) unless otherwise directed.</td></tr>
</table>

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

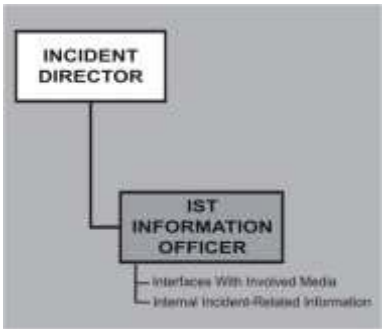
❒ Receive a briefing from your supervisor.

- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ As required, assists the Incident Director in advising and supporting the Incident Management Team (IMT).
- ❒ Fill one or more IST Command Staff functions until these functions are assigned.
- ❒ Help to set up the Emergency Operations Centre (EOC).
- ❒ As required, communicate with the Incident Commander or Deputy Incident Commander.
- ❒ Participate in Incident Support Team (IST) briefings.

Postincident Duties

- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the response to the Planning Section Head.

4.17 IST INFORMATION OFFICER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Interfaces with media involved in the emergency, prepares media releases and provides general public statements. Advises and supports the Incident Management Team (IMT) Information Officer. Provides internal incident-related information. Completes the media, mass public and internal incident-related information portions of the overall Communications Plan.	
Located at	Emergency Operations Centre (EOC)	
Reports to/ Assigned by	Incident Director	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Refer to Section 6.0, Media and Appendix 2 - Communications Plan for further details about media interaction.
- ❒ Advise and support the Incident Management Team (IMT) Information Officer regarding:
  - ❒ Media and public statements.
  - ❒ Internal incident-related information.
- ❒ Prepare media releases and handle inquiries from the media.

NOTES: The Incident Commander must approve all media releases.

Tervita will coordinate media releases with the petroleum regulatory agency prior to release to ensure consistency and accuracy of information. Information can be communicated

through written news releases, news conferences and any other effective means Tervita chooses to use.

If approached or contacted by the media, a Tervita employee or responder may give a Brief Factual Media Statement. Refer to Section 6.0 for an example Brief Factual Media Statement.

❒ Work with the Information Officer to provide internal incident-related information.

❒ The following information must be disseminated to the public immediately and during an incident:

Information Disseminated to the Public at the Onset of and During an Incident	
To those evacuated or sheltered - *At the Onset*	**To those evacuated or sheltered - *During***
• Type and status of incident. • Location and proximity of the incident to people in the vicinity. • Public protection measures to follow, evacuation instructions, and any other emergency response measures to consider. • Actions being taken to respond to the situation, including anticipated time period. • Contacts for additional information.	• Description of the products involved and their short-term and long-term effects. • Effects the incident may have on people in the vicinity. • Areas impacted by the incident. • Actions the affected public should take if they experience adverse effects.

To the General Public - *During*
• Type and status of the incident. • Location of the incident. • Areas impacted by the incident. • Description of the products involved. • Contacts for additional information. • Actions being taken to respond to the situation, including anticipated time period.

❒ Participate in Incident Support Team (IST) briefings.

Postincident Duties

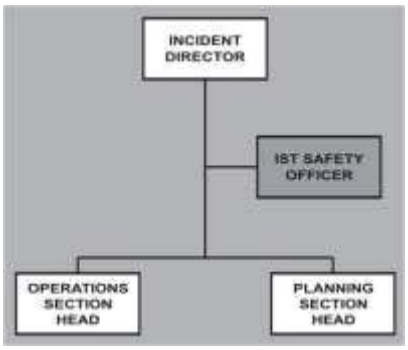
❒ If required, continue to advise and support the Incident Management Team (IMT) Information Officer regarding:

- ❒ Media and public statements.
- ❒ Internal incident-related information.

❒ Participate in the Postincident Debrief held by your supervisor.

❒ Forward all data related to the response to the Planning Section Head.

4.18 IST SAFETY OFFICER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Advises and supports the Incident Management Team (IMT) Safety Officer regarding developing and recommending measures for ensuring responder safety. May provide advice and support to the Incident Management Team (IMT) Safety Officer to review the Incident Objectives form (ICS Form 202), the Incident Briefing form (ICS Form 201), the Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A) and the overall Incident Action Plan (IAP) for responder safety implications. Discontinues any operation which threatens the health and safety of responders.	
Located at	Emergency Operations Centre (EOC)	
Reports to/ Assigned by	Incident Director	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

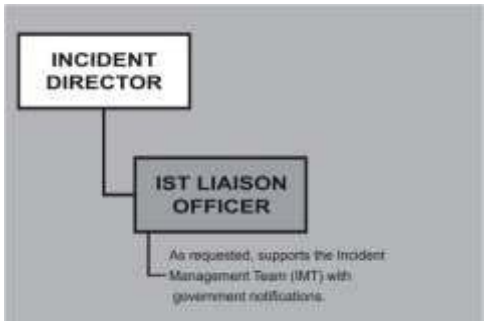
- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Advise and support the Safety Officer regarding:
  - ❒ Developing and recommending measures for ensuring responder safety.
  - ❒ The review of the **Incident Objectives** form **(ICS Form 202)**, the **Incident Briefing form (ICS Form 201)**, the **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A)** and the overall Incident Action Plan (IAP) for **responder safety** implications.
- ❒ Discontinue any operation which threatens the health and safety of responders.
- ❒ Obtain a head count of all responders dispatched to the Emergency Operations Centre (EOC).

- ❒ Ensure all responders follow the appropriate safe-work procedures. Refer to Tervita's Health and Safety Manual.
- ❒ Provide Drug and Alcohol Policy Guidance.
- ❒ Participate in Incident Support Team (IST) briefings.

Postincident Duties

- ❒ As required, continue to advise and support the Safety Officer.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the response to the Planning Section Head.

4.19 IST LIAISON OFFICER

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Advises and supports the Incident Management Team (IMT) Liaison Officer regarding interfacing with government agencies involved in the incident. Advises and supports in completing the government agency portion of the overall Communications Plan.	
Located at	Emergency Operations Centre (EOC)	
Reports to/ Assigned by	Incident Director	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

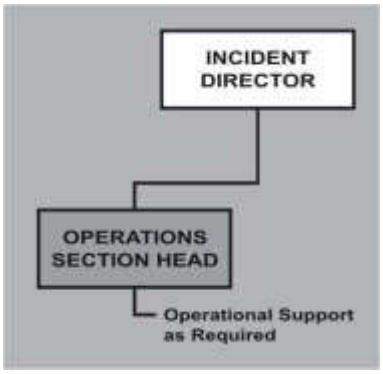
Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Advise and support the Liaison Officer regarding the notification of involved government agencies.
- ❒ Participate in Incident Support Team (IST) briefings.

Postincident Duties

- ❒ As required, continue to advise and support the Liaison Officer.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the response to the Planning Section Head.

4.20 OPERATIONS SECTION HEAD AND IST OPERATIONS SECTION

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Advises and supports the Incident Management Team (IMT) Operations Section Chief regarding activities at the site of the incident to maximize on-site responder safety and control and containment of the hazard. Advises and supports the Incident Management Team (IMT) Operations Section Chief regarding planning zone and response zone responder safety and public protection measures to maximize Public protection.	
Located at	Emergency Operations Centre (EOC)	
Reports to/ Assigned by	Incident Director	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	

Information Exchange (Informal Communication)	Open to responders to freely exchange information.
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.
Single Resources	Single Resources include both personnel and their required equipment (e.g. On-site Safety)
Task Forces	A Task Force is a combination of **different** types and kinds of single resources assembled for a particular tactical need, with common communications and a leader (e.g. Well Control Task Force). Task forces can be pre-determined or assembled at an incident from available single resources. Span of control guidelines apply.
Strike Teams	A Strike Team is a combination of the **same** types and kinds of single resources assembled for a particular tactical need, with common communications and a leader (e.g. Fire Fighting Task Force). Strike teams can be pre-determined or assembled at an incident from available single resources. Span of control guidelines apply.

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Advise and support the Operations Section Chief regarding:
  - ❒ Activities at the site of the incident to maximize on-site responder safety and control and containment.
  - ❒ Planning zone and response zone responder safety and public protection

measures to maximize public protection.

- ❒ Ignition (Refer to Section 5.0, Ignition for ignition equipment and procedures and the appropriate Provincial and/or Regulatory for specific ignition criteria).

❒ As required, mobilize a deputy.

❒ Participate in Incident Support Team (IST) briefings.

Postincident Duties

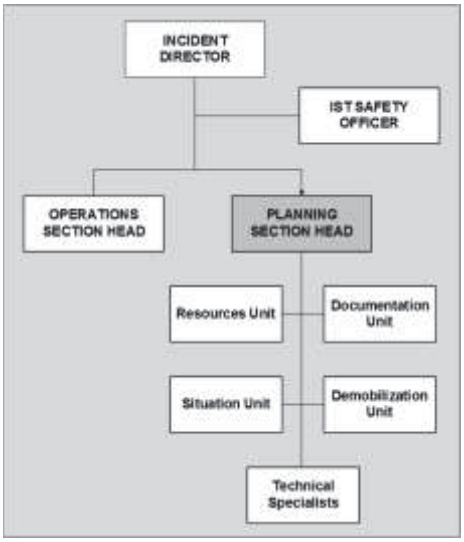
❒ As required, continue to advise and support the Operations Section Chief regarding:

- ❒ Activities at the site of the incident to maximize on-site responder safety.
- ❒ Planning zone and response zone responder safety and public protection measures to maximize public protection.

❒ Participate in the Postincident Debrief held by your supervisor.

❒ Forward all data related to the response to the Planning Section Head.

4.21 PLANNING SECTION HEAD AND IST PLANNING SECTION

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Advises and supports the Incident Management Team (IMT) Planning Section Chief regarding compiling the overall "Incident Action Plan (IAP)". Advises and supports the Incident Management Team (IMT) Planning Section Chief regarding technical assistance and/or technical specialists required for the response. Ensures incident information is documented, current, accurate and disseminated to the Incident Support Team (IST).	
Located at	Emergency Operations Centre (EOC)	
Supervises Activities of	IST Resources Unit Leader	
	IST Situation Unit Leader	
	IST Documentation Unit Leader	
	IST Demobilization Unit Leader	
	IST Technical Specialists	
Reports to/ Assigned by	Incident Director	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Ensure incident information is documented, current, accurate and disseminated to the Incident Support Team (IST). Utilize the:
  - ❒ **Incident Objectives** form **(ICS Form 202)**.
  - ❒ **Incident Briefing** form **(ICS Form 201)**.
  - ❒ **Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A).**
  - ❒ **Issues Board**
  - ❒ **Status Board**

- ❒ Advise and support the Planning Section Chief regarding:
  - ❒ The compiling of the overall Incident Action Plan (IAP).

    NOTE: Key components of the Incident Action Plan (IAP) are the on-site responder safety action plan, the planning zone and response zones responder safety action plan, the planning zone and response zones public protection measure action plan and the control and containment action plan.

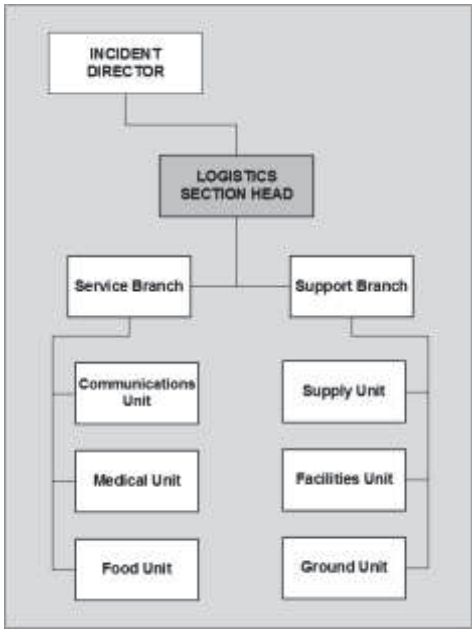
  - ❒ Technical assistance and/or technical specialists (engineering, plume dispersion, environmental, well control, metal fatigue, etc.) required for the response.
  - ❒ Identifying future incident support requirements for Tervita.
- ❒ As required, mobilize a deputy.
- ❒ Post and maintain charts, plot plans, surveys, maps and sketches as they are developed.
- ❒ Ensure all Incident Support Team (IST) members are documenting their actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ As required, develop a group email to ensure responders are informed in a timely fashion. Tervita's group emails will not be relied upon as the primary communications method.
- ❒ As required, proactively mobilize an:
  - ❒ **IST Resources Unit Leader** - to provide advice and support for check-in activity and for maintaining the status on all resources (manpower and equipment) assigned to the incident.
  - ❒ **IST Situation Unit Leader** - to provide advice and support for collecting and processing information about the current situation, preparing situation displays and situation summaries and developing maps and projections. The IST Situation Unit Leader may provide **advice** and **support** for mobilizing the following single resources: Display Processor, Field Observer or Weather Observer.
  - ❒ **IST Documentation Unit Leader** - to provide advice and support in preparing the overall Incident Action Plan (IAP), maintaining all incident-related documentation and providing duplication services.
  - ❒ **IST Demobilization Unit Leader** - to provide advice and support in ensuring the orderly, safe and cost-effective demobilization of no longer required response resources.

  NOTE: Specific response team duties for the above mentioned Incident Support Team (IST) Unit Leaders are not included in this emergency response plan other than those listed immediately above.
- ❒ Utilizing a Briefing Form facilitate Incident Support Team (IST) briefings.

Postincident Duties

- ❒ As required, continue to advise and support the Incident Management Team (IMT) Planning Section Chief regarding compiling the overall Postincident Action Plan.
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Gather all Incident Support Team (IST) data related to the response.

4.22 LOGISTICS SECTION HEAD AND IST LOGISTICS SECTION

Primary Objectives	1. Responder safety 2. Public protection 3. Control and containment of the hazard	Suggested Primary ICS Positions (Other positions mobilized as required.)
Roles	Advises and supports the Incident Management Team (IMT) Logistics Section Chief regarding the procurement of equipment, services and personnel. Advises and supports the Incident Management Team (IMT) Logistics Section Chief in ensuring all Incident Management Team (IMT) members are trained, accredited and have the appropriate personal protective equipment before they are dispatched.	
Located at	Emergency Operations Centre (EOC)	
Supervises Activities of	IST Supply Unit Leader	
	IST Facilities Unit Leader	
	IST Ground Support Unit Leader	
	IST Communications Unit Leader	
	IST Food Unit Leader	
	IST Medical Unit Leader	
Reports to/ Assigned by	Incident Director	
Public Protection Measures	Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).	
Information Exchange (Informal Communication)	Open to responders to freely exchange information.	
Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)	Must follow the hierarchy of command (chain of command) unless otherwise directed.	

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Advise and support the Logistics Section Chief:
  - ❒ Regarding the procurement of equipment, services and personnel.
  - ❒ In ensuring all responder are trained, accredited and have the appropriate personal protective equipment (PPE) before they are dispatched. Personal protective equipment (PPE) only reduces; but does not eliminate the risk from harmful substances.
- ❒ As required, support the Incident Management Team (IMT) or the Incident Support Team (IST) by procuring the following:

- ❒ Information technology requirements [communications equipment, computer systems, group emails, etc.].
- ❒ Emergency Operations Centre (EOC) support (facilities, security, clerical, etc.).
- ❒ Supplies, services and equipment [contractors, Western Canadian Spill Services (WCSS) equipment, catering services for the responders, etc.].
- ❒ Personnel [Tervita, mutual aid, Western Canadian Spill Services (WCSS)].
- ❒ Transportation.

❒ As required, mobilize a deputy.

❒ As required, mobilize a Calgary Office Receptionist. Ensure this Receptionist has a copy of the **Incident Briefing** form **(ICS Form 201)** and that she/he knows where to direct incident-related calls.

❒ As required, proactively mobilize an:

- ❒ **IST Supply Unit Leader** - to provide advice and support in ordering personnel, equipment and supplies. The IST Supply Unit Leader may provide **advice** and **support** for mobilizing the following single resources: Ordering Manager or Receiving and Distribution Manager.
- ❒ **IST Facilities Unit Leader** - to provide advice and support in setting up and maintaining any incident-related facilities. The IST Facilities Unit Leader may provide **advice** and **support** for mobilizing the following single resource: Security Manager.
- ❒ **IST Ground Support Unit Leader** - to provide advice and support for transportation and fuel for the response.
- ❒ **IST Communications Unit Leader** - to provide advice and support for distributing and maintaining all response communication equipment and computer systems.
- ❒ **IST Food Unit Leader** - to provide advice and support for supplying food and potable water for incident-related facilities.
- ❒ **IST Medical Unit Leader** - to provide advice and support in developing a medical plan for incident-related first aid and medical treatment. May also provide **advice** and **support** in developing a medical transportation plan (ground/air) and also any medical reports.

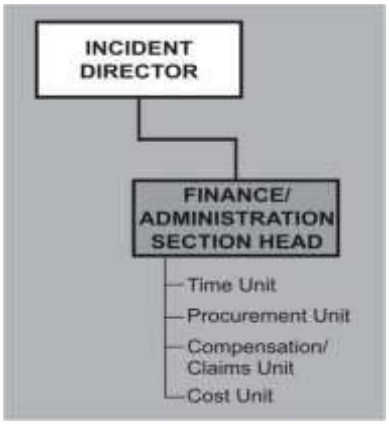
NOTE: Specific response team duties for the above mentioned Incident Support Team (IST) Unit Leaders are not included in this emergency response plan other than those listed immediately above.

❒ Participate in Incident Support Team (IST) briefings.

Postincident Duties

- ❒ Notify the Calgary Office Receptionist (if established).
- ❒ Participate in the Postincident Debrief held by your supervisor.
- ❒ Forward all data related to the response to the Planning Section Head.

4.23 FINANCE/ADMINISTRATION SECTION HEAD AND IST FINANCE/ADMINISTRATION SECTION

<table>
<tr><td>Primary Objectives</td><td colspan="2">1. Responder safety
2. Public protection
3. Control and containment of the hazard</td><td>Suggested Primary ICS Positions
(Other positions mobilized as required.)</td></tr>
<tr><td>Role</td><td colspan="2">Advises and supports the Incident Management Team (IMT) Finance/Administration Section Chief with time tracking, procurement procedures, compensation, claims and cost accounting.</td><td rowspan="6"> 
</td></tr>
<tr><td>Located at</td><td colspan="2">Emergency Operations Centre (EOC)</td></tr>
<tr><td rowspan="4">Supervises Activities of</td><td colspan="2">IST Time Unit Leader</td></tr>
<tr><td colspan="2">IST Procurement Unit Leader</td></tr>
<tr><td colspan="2">IST Compensation/Claims Unit Leader</td></tr>
<tr><td colspan="2">IST Cost Unit Leader</td></tr>
<tr><td>Reports to/ Assigned by</td><td colspan="2">Incident Director</td></tr>
<tr><td>Public Protection Measures</td><td colspan="3">Notification (with voluntary evacuation), Evacuation and/or Shelter-In-Place starts closest to the incident site, expanding outward first in a downwind direction and then in the remainder of the Emergency Planning Zone (EPZ).</td></tr>
<tr><td colspan="2">Information Exchange (Informal Communication)</td><td colspan="2">Open to responders to freely exchange information.</td></tr>
<tr><td colspan="2">Flow of Orders, Directives, Resource Requests and Status Changes (Formal Communication)</td><td colspan="2">Must follow the hierarchy of command (chain of command) unless otherwise directed.</td></tr>
</table>

RESPONSIBILITIES

Incident Investigation, Alerts and Minor Incidents

- ❒ No assigned duties during an Incident Investigation, Alert or Minor Incident.

Level One, Two or Three Emergency

- ❒ Receive a briefing from your supervisor.
- ❒ Chronologically document all actions, decisions, contacts and requests on an Activity Log **(ICS Form 214)**.
- ❒ Advise and support the Finance/Administration Section Chief with:
  - ❒ Time tracking.
  - ❒ Procurement procedures.
  - ❒ Compensation and claims.
  - ❒ Cost accounting.
- ❒ As required, mobilize a deputy.
- ❒ As required, proactively mobilize an:

- ❒ **IST Time Unit Leader** - to provide advice and support for ensuring response personnel time is recorded.
- ❒ **IST Procurement Unit Leader** - to provide advice and support for equipment rental and supply contracts. Provides advice and support for equipment time recording.
- ❒ **IST Compensation/Claims Unit Leader** - to provide advice and support for overseeing responder/worker compensation documentation (injury/illness) is correctly completed and the handling of investigation of damage claims.
- ❒ **IST Cost Unit Leader** - to provide advice and support for collecting incident-related cost information and providing cost estimates.

NOTE: Specific response team duties for the above mentioned Incident Support Team (IST) Unit Leaders are not included in this emergency response plan other than those listed immediately above.

❒ Participate in Incident Support Team (IST) meetings.

<u>Postincident Duties</u>

❒ Participate in the Postincident Debrief held your supervisor.

❒ Forward all data related to the response to the Planning Section Head.

CORE EMERGENCY RESPONSE PLAN

SECTION 5.0 - IGNITION

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

5.0 IGNITION

5.1 IGNITION EQUIPMENT

Ignition Equipment

An ignition team requires the following equipment:

- Flare guns with flares.
- Rescue harness (d-ring in front or safety belt with d-ring in the back or similar) with ~30 metres (100 feet) retrieval ropes.
- Flame-resistant coveralls.
- Ear protection.
- Hard hats (with face shields, if available, for protection against flashbacks).
- Self-contained breathing apparatus (SCBA).
- Flame-resistant balaclava, hard hat liners or flame-resistant regular hard hat liners for use with self-contained breathing apparatus (SCBA).
- Lower explosive limit (LEL) gas detector.
- H_2S gas detector (for sour gas ignition).
- Vehicle with communication to their supervisor.

5.2 IGNITION PROCEDURES

Ignition Procedures

Ignition of a sour gas or HVP release is a hazardous procedure and should be conducted with caution by trained personnel following safe-work procedures. Never attempt the procedure with fewer than two people, so that there is one person for rescue backup.

Flare Gun Ignition Procedures:

1. The On-site Branch Director ensures that on-site personnel have retreated to the Safe Area.
2. The Ignition Team reviews the flare gun manufacturer's loading instructions and specifications for the flare gun and wears their personal protective equipment (PPE).
3. If available, two backup personnel are positioned at a safe distance upwind from the release. They stand by to rescue the ignition person(s) if necessary.

4. The Ignition Team, equipped with the flare gun and flares and monitoring with a LEL and H_2S gas detector (if appropriate), approaches to within 100 metres of the suspected outside edge of the plume.
5. The Ignition Team positions themselves at a location that:
    - Allows for safe retreat.
    - Is upwind or crosswind from the release.
    - Is free of explosive mixtures.
    - Is no closer than necessary (The flare should be aimed to just reach the outside edge of the plume.)

    NOTE: A 12-gauge pistol flare has an approximate altitude of 80 metres and a 4-caliber pistol flare has an approximate altitude of 120 metres.
6. Choosing the firing position, either standing or prone, that is most comfortable and suitable for the circumstances, one Ignition Team person loads, aims and fires the flare gun.
7. After the gun is fired, uncovered skin should not be exposed toward the flare.
8. If the plume does not ignite, the Ignition Team moves a few metres closer to the suspected edge of the plume. Do not move any closer to the plume than the launcher's range, probably about 60 metres. Repeat Steps 5, 6, 7 and 8.

Self-Contained Flame-Thrower Unit Ignition Procedures:

When required by regulation or when deemed necessary by the company, there will be two well ignition systems at a wellsite. The primary ignition system is a self-contained flame-thrower unit with an independent fuel source. This system incorporates a remote-control panel with a time-delayed triggering device that allows for complete evacuation of the wellsite before the well is ignited. The secondary ignition system is a flare gun.

The On-site Branch Director follows the procedure below to ignite the well:

1. Ensure wellsite personnel have retreated to a Safe Area.
2. Form an Ignition Team.
3. Ensure the Ignition Team wears personal protective equipment (PPE). Ensure the personnel also wear harnesses equipped with lanyards (retrieval ropes).
4. Position two backup personnel at a safe distance from the release. These personnel stand by to rescue the ignition personnel if necessary.
5. Once the wellsite is evacuated, the Ignition Team activate the primary ignition system by inserting the key into the control panel key switch and turning the key clockwise.
    - At this point, a siren and strobe light will be activated at the control panel.

- Ignition personnel egress from the area.
- Three minutes after the key has been turned on, the siren will silence and a pilot light will be lit at the unit.

NOTE: Strobe light stays on to indicate the system is active.

- Two minutes after the pilot light has been lit, the first discharge of gel will be released through the burning pilot. The duration of this discharge is ~five seconds.
- The discharge will result in an 80 to 90 foot stream of burning gel being directed into the derrick, where it will splatter and fall. This will ensure ignition even if the gas release is in a horizontal direction. The residual burn time of the gel is approximately three to four minutes.
- Every three minutes after the initial discharge, another discharge will occur, until the system is emptied or manually shut off.
- Approximate number of discharges is twenty. If the well extinguishes itself, ignition will automatically re-occur for a considerable length of time.

NOTES: Ignition can be aborted at any time by turning off the key.

The stream of ignited gel is under high pressure to minimize the effect of high winds.

If the self-contained flame-thrower unit fails, the ignition personnel proceed with flare gun ignition procedures.

SECTION 6.0 - INCIDENT-SPECIFIC RESPONSE ACTIONS

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

6.0 INCIDENT-SPECIFIC RESPONSE ACTIONS

6.1 INCIDENT-SPECIFIC RESPONSE ACTIONS - COMMON TO ALL RESPONSES

Daily Emergency Preparedness Actions:

- ❒ Identify who you would contact in the event of an emergency (the potential Incident Commander).
- ❒ Identify egress routes and muster locations.
  - ❒ Ensure there is a head count obtained for all site personnel (refer to facility sign-in and Pre-Shift Safety meeting sheet).
- ❒ Identify where relevant safety equipment is located [personal protective equipment (PPE), fire extinguishers, first aid kits, etc.].
- ❒ Understand how to initiate site evacuation in the event of an alarm or incident.

Common Response Actions:

- ❒ Follow the Initial On-site Actions - 7 Steps. Refer to Section 1.0.
- ❒ Contact your immediate supervisor.
- ❒ As required, call Tervita's 24-hour Emergency Number: **1-800-327-7455**.
- ❒ As required, call fire, local RCMP/local police or ambulance: **911**.
- ❒ Protect the public.
- ❒ As required, call for backup. As required, responders will be dispatched in pairs to investigate – the "buddy system".
- ❒ As required, call for internal or external support resources (manpower and equipment). Attempt to use a Tervita preferred vendor.
- ❒ Ensure all personnel dispatched to the incident site are trained, accredited and have personal protective equipment (PPE).
- ❒ Document your response actions.
- ❒ Initiate your emergency response plan and determine who the Incident Commander is.
- ❒ As required, refer to the "Brief Factual Media Statement for any Tervita Responder"; located in this section.
- ❒ Initiate the appropriate Incident Specific Response Action.

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

6.2 TERVITA'S 24-HOUR EMERGENCY NUMBER PERSONNEL

Response Actions:

- ❒ Document the caller's name, telephone number and business unit (if the caller is an employee to Tervita)
- ❒ Location (province/state, address, ZIP/Postal Code, LSD).
- ❒ Ask "*What is the closest major town or centre?*"
- ❒ Ask "*What is the nature of your emergency?*" and "*Have emergency services been notified?*"
- ❒ Instruct the caller to **Shelter-In-Place**.
- ❒ Reassure the caller that a regional incident commander will be activated to respond to the situation.
- ❒ Document all the information the caller provided and send an E-Notice to the primary contact and appropriate distribution list.
- ❒ Using CO-HSE-SUP-0909 24-HR Emergency Notification Procedure, initiate a calldown until a contact is reached (direct contact must be made, messages cannot be left). Communicate issue and original caller contact information.

6.3 MEDIA AND BRIEF FACTUAL MEDIA STATEMENT

Appendix 2 contains Tervita's Communications Plan which outlines how the company will communicate with stakeholders.

Brief Factual Media Statement for any Tervita Responder:

NOTE: Tervita's IST Information Officer is the Tervita responder responsible for official Tervita media releases. Any Tervita employee or responder may provide the following statement to the media:

> *"We are currently dealing with the situation at hand to ensure the safety of people, the environment and property. A statement will be released by the company once the facts have been determined. If you would like to leave your contact information, a company representative will provide you with information as it becomes available. If you require further information please contact our Information Officer at:* **1-866-537-1207***."*

6.4 LIQUID HYDROCARBON SPILL RESPONSE (Oil/Chemical/Produced Water/etc.)

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product and its immediate hazards (flammable/toxic vapours, fire/explosive hazards, etc.) before initiating cleanup operations.
- ❒ Approach the site from an upwind or crosswind direction.
- ❒ Identify safe escape routes away from the Hazardous Area.
- ❒ Observe surrounding area for possible ignition sources; eliminate if possible.
- ❒ If possible, and safe to do so, isolate or shut in the leak.
- ❒ If possible, prevent fluids from entering a waterway or other sensitive areas.
- ❒ As required, mobilize area oil spill cooperative equipment.
- ❒ Keep unauthorized personnel away.

The following sections provide basic hydrocarbon spill response guidelines. For greater details, refer to a Western Canadian Spill Services Ltd. (WCSS) Oil Spill Contingency Manual (http://wcss.ab.ca/ContingencyManualWeb1_2015_Oct_09.pdf), applicable Safety Data Sheets (SDS), the Alaska Clean Seas Technical Manual (http://alaskacleanseas.org/wp-content/uploads/2010/12/ACS_Tech_Manual_Rev9_Vol1-TACTICS.pdf) or a similar manual.

Site Layout

Before the arrival of recovery equipment at the spill control point, inspect the site and decide how the containment and recovery operation is to be staged. The following issues must be addressed:

- Potential danger to responders Yes ☐ No ☐
- Potential danger to the public Yes ☐ No ☐
- Presence of toxics or flammables Yes ☐ No ☐
- Staging Area for containment and recovery equipment Yes ☐ No ☐
- Work required on private property Yes ☐ No ☐
- Work required on public property Yes ☐ No ☐
- Permission for site access Yes ☐ No ☐
- Vehicle access to location Yes ☐ No ☐
- Need for storage tanks or earthen pits Yes ☐ No ☐
- Special site grading requirements to allow equipment access Yes ☐ No ☐

- Boat launch requirements Yes ☐ No ☐
- Site safety requirements when deploying the booms and skimmers Yes ☐ No ☐
- Tree and bush clearing requirements Yes ☐ No ☐

NOTE: If site grading, bush clearing, etc. is required, then the men and equipment for this work should be contacted immediately.

- Situating the On-site Command Post (OSCP) Yes ☐ No ☐

Recovery Techniques

There are two basic means of stopping the flow of petroleum products floating on water: a boom or a dam. If the stream/river is relatively large, booms are used. A dam may be constructed across the channel of a small stream with a low flow.

If the stream/river is to be boomed, the appropriate equipment should be obtained from the area oil spill cooperative. Decisions must incorporate the following considerations:

- Width of stream/river which must be boomed. Where possible, the entire stream/river width should be boomed.
- Allowable boom angle based on stream current and length of boom required.
- Anchoring methods for the booms.
- Methods to lay out and deploy a boom.

If a dam is to be constructed across a small stream or channel, some allowance must be made for the flow of water past the dam.

Containment and Storage of Product

When commercial barriers are not suitable or available, particularly in remote areas, barriers may be improvised. Improvising depends on the materials at hand and the situation in which the spill has occurred. In each case, the experience and innovative ability of the personnel at the spill site is needed for the successful containment of the spill.

Tank trucks, storage tanks or an earthen pit may be used to store recovered petroleum products. An earthen pit should only be constructed when tank trucks or storage tanks cannot be used. Earth-moving equipment will be required to construct a pit. Plastic lining should be used.

Disposal and Remedial Operations

Disposal of the product and site restoration actions will be determined with consultation between Tervita operations personnel, provincial environmental protection agency or other environmental regulators and any external professional environmental consultants contracted by Tervita.

Specific Response Details for Containment and Recovery of Uncontrolled Fluid Releases in or Near a Flowing Waterbody

Following an uncontrolled release and once safe working conditions have been established, the initial steps of the spill response process are the containment and recovery of the spilled product.

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

In the case of a fluid release near a flowing waterbody, rapid containment of the spilled product is essential to prevent its entry into the watercourse and subsequent downstream migration. Like any surface water related project, spill response activities including containment, recovery and a sampling plan should be presented to and approved by the provincial and federal regulators.

Effective containment techniques vary depending on the nature of the product released and the site conditions, but usually involve the construction of berms, trenches and/or bellholes along the pathway between the contaminant source and the waterbody. Recovery of the spilled product with vacuum trucks is usually initiated at the same time to prevent overflowing of the containment structures and further soil contamination through infiltration. In smaller streams, inverted weirs can also be constructed. These structures allow the water to flow through, while capturing any free product floating on surface.

Depending on the nature of the product spilled, additional containment can be deployed along the watercourse to prevent or minimize the downstream migration of the product. For hydrocarbons, depending on their volatility, a combination of containment booms, sheen booms and adsorbent pads can be used. Containment booms trap free product floating on the water surface, while sheen booms and adsorbent pads soak up lighter end hydrocarbons. Free product trapped upstream of a containment boom can be skimmed and pumped off for disposal.

Fine particulates, released as a result of a drilling mud spill or simply from activities around a spill site, can be detrimental to aquatic life and containments such as silt fences and silt curtains are commonly used to prevent contamination of a watercourse from sediment-laden water. Silt fences, along with straw bales, are typically deployed along the banks or across drainage paths. Silt curtains are deployed across a watercourse.

Products that are readily soluble in water such as methanol, produced water, corrosion inhibitor and to a lesser extent light hydrocarbons such as gasoline and condensate cannot be effectively contained once they enter a watercourse. Then, the focus of the response is on impact delineation through the implementation of a surface water sampling program.

6.5 OUT OF CONTROL WELL

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product and its immediate hazards, e.g. flammable/toxic vapours, fire hazards, etc. Approach the site from an upwind or crosswind direction.
- ❒ Don't approach the site without appropriate backup.
- ❒ Ensure an appropriate air monitoring strategy is employed.

- ❒ Assess the nature of the problem. Prepare appropriate responses to bring well under control.
- ❒ Keep unauthorized personnel away.
- ❒ Consider a well control expert if necessary.

6.6 FIRES OR EXPLOSIONS

There are three main classes of common fires (A, B, and C) and two specialty classes (D and K).

NOTE: Other than small incipient fires (size of a small garbage can), the Tervita philosophy to fight fire will primarily be defensive.

 **A**	Class A fires involve common combustibles such as wood, paper, cloth, rubber, trash and plastics. They are common in typical commercial and home settings, but can occur anywhere these types of materials are found.
 **B**	Class B fires involve flammable liquids' gases, solvents, oil, gasoline, paint, lacquers, tars and other synthetic or oil-based products. Class B fires often spread rapidly and, unless properly secured, can reflash after the flames are extinguished.
 **C**	Class C fires involve energized electrical equipment, such as wiring, controls, motors, data processing panels or appliances. They can be caused by a spark, power surge or short circuit and typically occur in locations that are difficult to reach and see.
 **D**	Class D fires involve combustible metals such as magnesium and sodium. Combustible metal fires are unique industrial hazards which require special dry powder agents.
 **K**	Class K fires involve combustible cooking media such as oils and grease commonly found in commercial kitchens. The new cooking media formulations used in commercial food preparation require a special wet chemical extinguishing agent that is specifically suited for extinguishing and suppressing these extremely hot fires that have the ability to reflash.

General Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product and its immediate hazards.
- ❒ Approach the site from an upwind or crosswind direction.
- ❒ Identify safe escape routes away from the Hazardous Area.
- ❒ **Do not extinguish burning leaks if the leak or supply to the leak cannot be stopped.**
- ❒ Only attempt to control small fires. Procure adequate backup and extinguishing agents before an attempt is made to battle a large fire. Do not attempt to battle a large fire under any circumstances – firefighting shall remain the sole response action/responsibility of the responding fire department.

- ❒ Professional oilfield fire fighters should deal with extensive fires or uncontrolled facility fires.
- ❒ If safe to do so, initiate actions to prevent the spread of the fire, remove flammable materials, protect surrounding property, etc.
- ❒ Keep unauthorized personnel away.

6.7 ENCROACHING GRASSLAND OR BUSH FIRES

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product that could be threatened and its immediate hazards.
- ❒ Establish a safe escape route if workers are still able to work at the site.
- ❒ Advise fire authorities if company property is threatened by an external fire.
- ❒ Advise first responders about potential flammable/toxic vapours, fire hazards etc.
- ❒ Determine and if necessary initiate emergency shutdown/depressurization for any facilities threatened by fire.
- ❒ Establish a fire watch to monitor the progress of a fire.
- ❒ Do not attempt to battle a large fire under any circumstances – firefighting shall remain the sole response action/responsibility of the responding fire department.
- ❒ Evacuate the facility before the fire reaches it.
- ❒ Establish and maintain contact with regional authorities; evac as instructed.

6.8 HYDROCARBON FIRE CONTROL

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

The effectiveness of the following guidelines depends on the judgment exercised by all personnel-think before acting. To extinguish hydrocarbon fires and prevent further explosions, it is necessary to do at least one of the following:

1. **Remove fuel** by isolating the section of equipment on fire and pumping out or depressurizing the flammable material.
2. **Remove oxygen** by the use of steam, chemicals, foam, dry powder or CO_2 extinguishers. If the fire is small, the flames can be smothered with a fire blanket, new tarpaulin or sand.
3. **Cool fuel so that it no longer produces vapors** using water where possible (as a fog) to extinguish fires or as a coolant for equipment, tanks, support

columns, etc. or use to provide a protective shield while the fire is being extinguished by foam, chemicals or power extinguishers.

Gas, natural gas liquid (NGL) and liquefied petroleum gas (LPG) fires must be controlled by closing valves at source and/or cooling lines and vessels with water until the fire burns out. They should not be extinguished while fuel is available because of the danger of spreading a combustible mixture over a large area with the possibility of accidental re-ignition.

Hydrocarbon Fire Control NOT Involving NGL/Propane Tanks/Pressurized Vessels Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product and its immediate hazards.
- ❒ Establish a safe escape route if workers are still able to work at the site.
- ❒ Shut in all known fuel sources. Do not extinguish a leaking gas flame unless the leak can be stopped.
- ❒ Shut off high voltage power supplies to equipment in fire-affected area.
- ❒ Shut off fuel to heaters near to or downwind of the fire.
- ❒ Observe surrounding area for other possible re-ignition sources and if safe to do so take appropriate steps to eliminate these hazards.
- ❒ Dissipate static electrical charges on bodies of all personnel in area. Grounding may be accomplished by holding onto a metal structure for ten seconds with bare hands.
- ❒ Do not use water jet. For a small fire, use dry chemical, CO2, water spray or foam. Beware of electrical hazards. Do not attempt to battle a large fire under any circumstances – firefighting shall remain the sole response action/responsibility of the responding fire department.
- ❒ Move containing vessels from the fire area if this can be done without risk.
- ❒ Cool containing vessels with flooding quantities of water until long after fire is out.

Hydrocarbon Fire Control Involving NGL/Propane Tanks/Pressurized Vessels Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product and its immediate hazards.
- ❒ Establish a safe escape route if workers are still able to work at the site.
- ❒ Do not extinguish burning leaks if the leak or supply to the leak cannot be stopped.
- ❒ For a fire, fire control must occur from a maximum distance or use hose holders or monitor nozzles.

- ❒ Do not direct water at source of leak or venting safety devices as icing may occur.
- ❒ Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ❒ For a leak or spill consider evacuation for at least 800 metres downwind.
- ❒ For a fire consider evacuation for at least 1600 metres in all directions.
- ❒ Always stay away from tank ends.
- ❒ Keep unauthorized personnel away.

Boiling Liquid Expanding Vapour Explosion (BLEVE)

A boiling liquid expanding vapour explosion (BLEVE) occurs when sealed containers of liquefied gases and propane tanks are accidentally exposed to and enveloped by fire. Vapours from liquefied gas are initially heavier than air and spread along ground. Those vapours may travel to a source of ignition and flash back. Vapour is generated and internal pressure rapidly rises. At the same time the container wall temperature rises in the unfilled area; wall strength deteriorates and eventually, even though a pressure relief valve may be operating, the stress applied by the increased pressure exceeds the reduced strength of the wall.

The container eventually ruptures and super-heated liquid is released, expands and vaporizes in seconds, resulting in catastrophic damage from the spread of ignited vapours. The ruptured vessel or tank could propel dangerous shrapnel significant distances. It is therefore important that vessels or tanks are kept cool and the external fires extinguished quickly with water sprays or natural fluoroprotein based foams at low or medium expansion where other hydrocarbon liquid are involved.

Propane is naturally a gas with a boiling point of -42°C (-44°F). One gallon of liquid propane will expand to 270 gallons of propane gas. Thus, whenever leaks occur for liquid propane, large amounts of propane gas would be produced in a very short time. Since the vapour density of propane is heavier than air, the vapours will sink to the ground and follow the contours of the land. This means propane vapour will not dissipate readily. There is a tendency to form a dense vapour cloud at atmospheric conditions. A spill inside an enclosed area would result in the gas finding the lowest area to settle before dissipating slowly over time to fill the remaining space. Propane is most dangerous inside enclosed spaces due to the fact it can explode with an ignition source and it is classified as a simple asphyxiant. The oxygen level in a confined space must be more than 18% or 180,000 ppm to provide sufficient oxygen for a human to remain conscious without creating oxygen deficient symptoms.

BLEVE Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Observe surrounding area for other possible ignition sources and take appropriate steps to eliminate these hazards. Monitor the area.
- ❒ Be aware when a BLEVE occurs; sections of the tank can fly in any direction. Just avoiding the ends of the tank should not be considered a safe operating procedure.
- ❒ Keep unauthorized personnel away.
- ❒ Responders must be equipped with breathing apparatus and LEL monitors. If required, wear positive pressure self-contained breathing apparatus.
- ❒ Do not approach a liquefied petroleum gas (LPG) vapour cloud with a vehicle.
- ❒ Understand the type of product and its immediate hazards, e.g. flammable/toxic vapours, fire hazards, etc.
- ❒ Be aware that most liquefied petroleum gas (LPG) fumes are heavier than air and that vapours can gather in low-lying areas.
- ❒ Approach the site from an upwind or crosswind direction. Don't approach the site without appropriate backup. Stay out of low areas.
- ❒ Establish a safe escape route if workers are still able to work at the site.
- ❒ Do not extinguish burning leaks if the leak or supply to the leak cannot be stopped.
- ❒ All equipment used when handling the product must be grounded.
- ❒ If possible and safe to do so, isolate or shut in the leak.
- ❒ Do not walk through spilled material.

Fire fighters should do the following:

- ❒ Fire control must occur from a maximum distance or use hose holders or monitor nozzles. For massive fires, if this is impossible, leave the area and let the fire burn.
- ❒ Cool containers by flooding them with large amounts of water after the fire is out.
- ❒ Do not direct water at the source of the leak or at safety devices (icing may occur).
- ❒ Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

6.9 GAS RELEASES

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Understand the type of product and its immediate hazards, e.g. flammable/toxic vapours, fire hazards, etc.
- ❒ Approach the site from an upwind or crosswind direction.

NOTE: If the hazard does not meet certain regulatory criteria, a Site-Specific Supplemental Section may not exist. Therefore, a pre-assigned response zone, Emergency Planning Base Area Map and/or Telephone Directory may not be available. Assign a minimum 100 metre response zone and initiate public protection measures to a safe distance based on monitored readings.

- ❒ If the emergency involves H_2S:
  - ❒ Responders will be dispatched in pairs.
  - ❒ Responders must be equipped with breathing apparatus and H_2S, SO_2 and LEL monitors.
  - ❒ Ensure an appropriate air monitoring strategy is employed.
  - ❒ Monitor the area. Sour gas may accumulate in river valleys, coulees or other low-lying areas.
  - ❒ Monitor local weather conditions. Weather conditions such as temperature inversions, fog and wind may affect plume dispersions.
  - ❒ Refer to appropriate Provincial and/or Regulatory Section for any H_2S and SO_2 effects tables.
- ❒ If the emergency involves sweet gas:
  - ❒ Approach the site from an upwind or crosswind direction.
  - ❒ Ensure an appropriate air monitoring strategy is employed.
  - ❒ Monitor the area for LEL.
  - ❒ Monitor local weather conditions. Weather conditions such as temperature inversions, fog and wind may affect plume dispersions.
- ❒ Keep unauthorized personnel away.

6.10 HIGH VAPOUR PRESSURE (HVP) RELEASE

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Don't approach the site without appropriate backup.

- ❒ Understand the type of product and its immediate hazards, e.g. flammable/toxic vapours, fire hazards, etc. Extremely low temperatures exist when the liquid expands to the gaseous state. These temperatures can cause severe freezing to persons in proximity.
- ❒ Approach the site from an upwind or crosswind direction. A serious health hazard may exist due to the lack of oxygen surrounding a leak.
- ❒ Responders must be equipped with breathing apparatus and LEL monitors. The danger from fire/explosion exists when an escaping vapour mixes with air to within the upper explosive limit.
- ❒ Ensure an appropriate air monitoring strategy is employed.
- ❒ Monitor the area. Vapour may accumulate in river valleys, coulees or other low-lying areas.
- ❒ Monitor local weather conditions. Weather conditions such as temperature inversions, fog and wind will affect plume dispersions.
- ❒ Observe surrounding area for other possible ignition sources and take appropriate steps to eliminate these hazards: electrical switches, hot water heaters/house, furnaces, stones or rocks being moved violently against other hard objects by the escaping gas, etc.
- ❒ Keep unauthorized personnel away.

6.11 NATURAL GAS LIQUIDS (NGLs)

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Don't approach the site without appropriate backup.
- ❒ Do not approach a natural gas liquid (NGL) vapour cloud with a vehicle.
- ❒ Understand the type of product and its immediate hazards, e.g. flammable/toxic vapours, fire hazards, etc. Be aware that vapour plumes from any release are highly flammable.
- ❒ Approach the site from an upwind or crosswind direction.
- ❒ Responders must be equipped with breathing apparatus and LEL monitors.
- ❒ Monitor the area. Be aware that most natural gas liquid (NGL) fumes are heavier than air and that vapours can gather in low-lying areas.
- ❒ Observe surrounding area for other possible ignition sources and take appropriate steps to eliminate these hazards.
- ❒ Keep unauthorized personnel away.

6.12 PRODUCT TRANSPORTATION INCIDENT (EXCEPT FOR LPGs)

Priority of a product transportation incident is to protect the driver and the public and prevent the product from impacting the environment. If a transportation incident involves liquefied petroleum gas (LPG) see BLEVE above.

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ On public roadways, Tervita will work with local fire, local RCMP/local police and ambulance personnel to respond to the incident.
- ❒ Call **911**.
- ❒ Secure incident site from on-coming traffic. Keep unauthorized personnel away.
- ❒ If safe to do so, provide medical aid to the driver and passengers involved in the incident.
- ❒ If possible, interview the driver and review the manifest for products, volumes and carrier company name.
- ❒ If available, review SDS or the Transport Canada, 2012 Emergency Response Guidebook (ERG 2012) which guides responders in quickly identifying the generic hazards of the material(s) involved in the incident and includes general information to protect responders and the public.
- ❒ If safe to do so, assess the container integrity and secure the leak.
- ❒ If safe to do so, contain and clean up spilled product.

6.13 SERIOUS INJURIES OR FATALITIES

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ When an injury or fatality occurs, it is not necessary to declare an alert, minor incident or level of emergency if the situation is an isolated incident such as a vehicle incident and does not have the potential to escalate.
- ❒ Avoid excitement and panic.
- ❒ As required, notify the provincial OH&S.
- ❒ Ensure any fatalities are examined by a medical doctor.
- ❒ If a victim has not been declared legally dead, treat as if the person is alive.
- ❒ Do not resume operations until the appropriate investigations have been completed and approval has been granted by the required government agencies.

- ❒ Immediate notification shall be made by the Incident Commander to the Incident Director to ensure Tervita's Crisis Communications Plan is activated. All media inquiries shall be addressed by the Tervita Information Officer under Tervita's Crisis Communications Plan.

6.14 SEARCH AND RESCUE

Response Actions:

NOTE: Remember your "Primary Objectives": Responder Safety/Public Protection/Control and Containment.

- ❒ Refer to "Incident-Specific Response Actions - Common To All Responses".
- ❒ Each rescue situation requires unique procedures. One must rely on one's own intelligence and ingenuity as well as calmness to make the most of the situation. Still, there are a few basic principles that should be followed regardless of the situation
- ❒ If an employee has failed to routinely "report in" (usually later than one hour), notify the immediate supervisor.
- ❒ The search and rescue team should ensure their own safety is not threatened and that they carry out their activities in such a manner that one member of the team is in visual contact with the rescuers and keeps your immediate supervisor informed at all times.
- ❒ If safe to do so, dispatch a search and rescue team.
- ❒ The search and rescue team should be prepared to discover a possible victim.
- ❒ Upon discovery, initiate rescue and administer first aid as required.
- ❒ If possible and safe for the victim, initiate evacuation and transportation as required.
- ❒ If possible and safe for the victim, transport the victim to hospital and leave in a doctor's care.
- ❒ Maintain contact with search and rescue team.
- ❒ Make yourself available to the doctor to provide as much information about the incident as possible, e.g., type of chemicals involved, nature of incident, victim's name.

6.15 HELICOPTER LANDING PROCEDURES

Overview

These Helicopter Landing Procedures provide the typical steps to be carried out when mobilizing a helicopter for either medical or Rover support. As required, they can also be used for other situations.

Helicopter Air Ambulance Service

Situations including serious injuries may require the mobilization of a Helicopter Air Ambulance Service. The steps to mobilize a helicopter air ambulance are outlined

below. A flowchart outlining the primary Helicopter Air Ambulance Service steps is located following these steps.

Step 1:

Based on the location you want the helicopter to land, provide the helicopter landing area coordinates (latitude and longitude). Your emergency response plan Site-Specific Supplemental Section may contain the latitude and longitude for area facilities. A compass application on a smart telephone may also be able to provide you with latitude and longitude.

Step 2:

In preparation for helicopter landing:

- ❒ The landing area must be free of buildings, trees, wires and other obstructions.
- ❒ The landing area should be at least 30 x 30 metres square with streamers (if available) at each of the four corners. If desired, set out flares to delineate the landing area.
- ❒ As required, set up roadblocks approximately 500 metres either side of the landing area.
- ❒ If available, erect a wind sock 5 metres off the ground about 50 metres from the centre of the landing area.
- ❒ If safe to do so and available, park emergency vehicles under wires that cross a roadway. Leave vehicle warning lights on.
- ❒ Avoid shining bright lights toward landing area.
- ❒ Keep back 30 metres back from landing area during helicopter landing and take-off.
- ❒ Don't approach helicopter. The helicopter crew will approach you.
- ❒ **DO NOT** back emergency vehicles up to helicopter.
- ❒ No smoking or ignition sources are allowed in the area of the helicopter.

Loading of patient:

- ❒ Wait for helicopter crew to approach you.
- ❒ The helicopter crew will load patient(s) and specify if they require assistance with loading of the patient(s).
- ❒ Gather destination from helicopter crew before they begin to prepare for helicopter take-off.

Step 3:

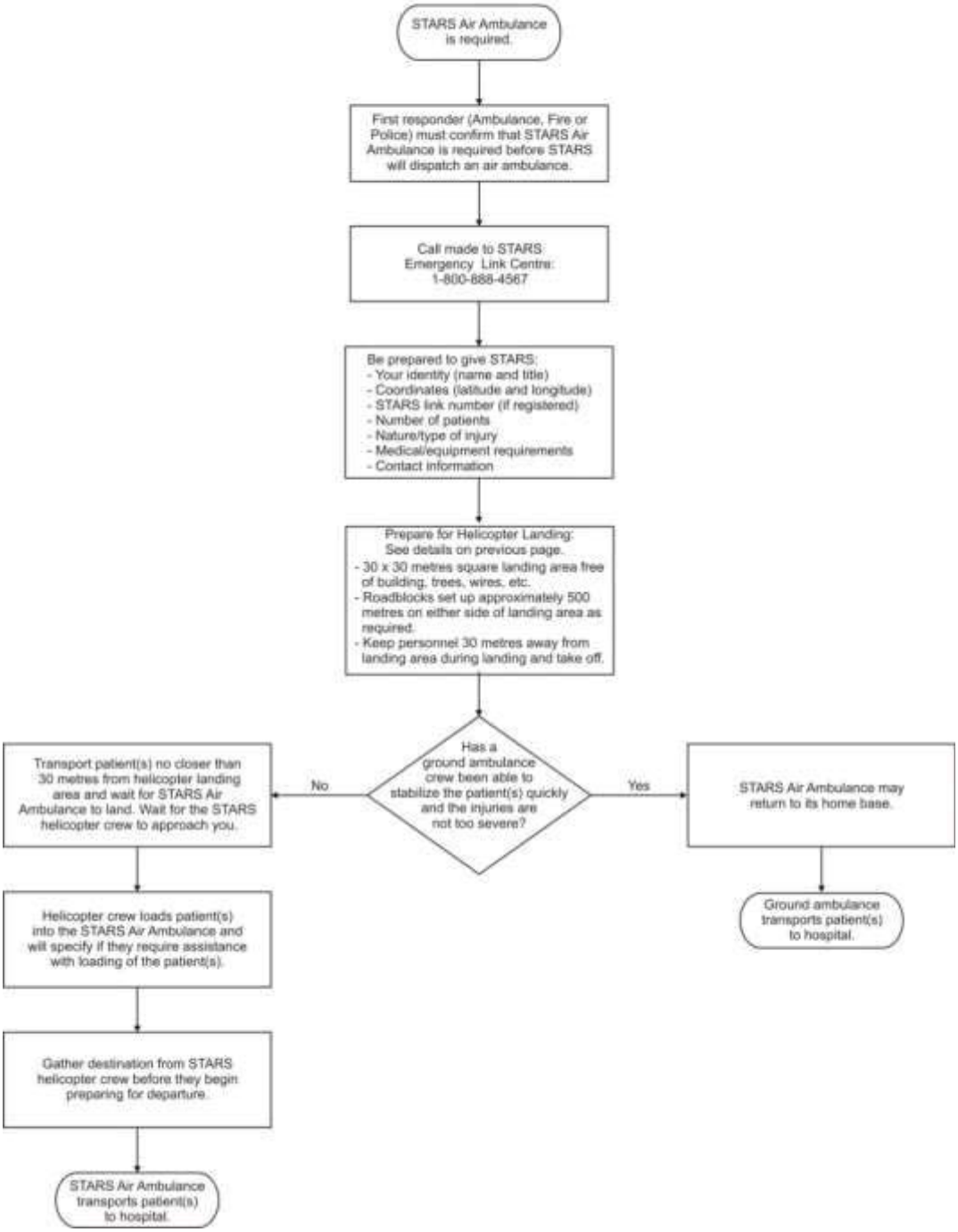
The Shock Trauma Air Rescue Society (STARS) is a non-government organization that provides emergency air ambulance service throughout portions of Alberta, British Columbia and Saskatchewan. STARS helicopters are dispatched from one Emergency Link Centre (helicopters are located in various locations). To make a response more efficient your location may have been pre-registered with STARS and have been issued a "STARS link number". Refer to the Site-Specific Supplemental Section for any "STARS link number".

STARS can only be activated by first responder personnel (ambulance, fire or police). Based on the circumstances, STARS may be immediately dispatched. If a ground ambulance crew were to stabilize a patient quickly and injuries not too severe, then STARS Air Ambulance may return to its home base.

The STARS Emergency Link Centre used to provide a service where they would connect you to the closest ground and/or air ambulance service. They **NO** longer provide this service.

Helicopter Air Ambulance Service Flowchart:

STARS Air Ambulance Service Flowchart



Helicopter Rover Support

When mobilizing a helicopter to support an emergency response (Rover support) follow the procedures outlined below:

- ❒ The landing area must be clear of buildings, trees, wires and other obstructions.
- ❒ Select a suitable landing area for a helicopter. The landing area should be as convenient to the Incident Command Post (ICP) or Remote Command Post (RCP), if activated, as is safe.
- ❒ A local air strip is a good spot for a helicopter landing area.
- ❒ The landing area should be at least 30 x 30 metres square with streamers (if available) at each of the four corners. If desired, set out flares to delineate the landing area.
- ❒ As required, set up roadblocks approximately 500 metres either side of the landing area.
- ❒ If available, erect a wind sock 5 metres off the ground about 50 metres from the centre of the landing area.
- ❒ Avoid shining bright lights toward landing area.
- ❒ Keep back 30 metres from landing area during helicopter landing and take-off.
- ❒ No smoking or ignition sources are allowed in the area of the helicopter.
- ❒ A Tervita representative (Rover) will accompany the helicopter to act as local area knowledge.
- ❒ Approach the helicopter only when instructed to by the pilot. Always approach a helicopter from the front, staying within the 10 and 2 o'clock position. Keep your hands down and head low.
- ❒ The Helicopter Rover must have contact with his/her immediate supervisor.

Incident Command System (ICS) Helicopter Terminology

Helibase: The main location for parking, fueling, maintenance, and loading of helicopters operating in support of an incident.

Helispot: Any designated location where a helicopter can safely take off and land. Some helispots may be used for loading of supplies, equipment, or personnel.

6.16 NOTIFICATION OF NEXT OF KIN

Response Actions:

- ❒ Tervita's Incident Director is responsible for ensuring the notification of next of kin is completed promptly. However, a death must first be confirmed by a medical doctor.
- ❒ Next of kin must be notified when an employee or contractor is missing, seriously injured or dies while working for Tervita.
  - ❒ All notifications of next of kin to be addressed through Tervita's Corporate Communications Plan.

CORE EMERGENCY RESPONSE PLAN

SECTION 7.0 - CORPORATE TELEPHONE DIRECTORY

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

7.0 CORPORATE TELEPHONE DIRECTORY

7.1 TERVITA CORPORATION

24-hour Emergency Number	**: 1-800-327-7455**
Calgary Office	: 1-855-837-8482
Calgary Office (Fax)	: 403-261-5612
Mailing and Courier Address:	Tervita Corporation 1600, 140 - 10 Avenue S.E. Calgary, AB T2G 0R1

7.2 TERVITA CORPORATION - EMERGENCY OPERATIONS CENTRES (EOCs)

Primary Emergency Operations Centre (EOC)

Calgary Office	: 1-855-837-8482
Calgary Office (Fax)	: 403-261-5612
Mailing and Courier Address:	Tervita Corporation 1600, 140 - 10 Avenue S.E. Calgary, AB T2G 0R1

Alternate Emergency Operations Centre (EOC)

Telephone Number	: 403-444-6940
Address:	BEHR Integrated Solutions Inc. 750, 600 - 6 Avenue S.W. Calgary, AB T2P 0S5

7.3 TERVITA CORPORATION - EMERGENCY CALLDOWN PROTOCOL

To initiate the Tervita emergency calldown protocol, the Tervita Head Office Receptionist or Tervita's 24-hour emergency number personnel will:

- ❒ Document the caller's name, telephone number and business unit (if the caller is an employee to Tervita)
- ❒ Location (province/state, address, ZIP/Postal Code, LSD).
- ❒ Ask *"What is the closest major town or centre?"*
- ❒ Ask "*What is the nature of your emergency?*" and "Have emergency services been notified?"
- ❒ Instruct the caller to **Shelter-In-Place.**
- ❒ Reassure the caller that a regional incident commander will be activated to respond to the situation.
- ❒ Document all the information the caller provided and send an E-Notice to the primary contact and appropriate distribution list.
- ❒ Using CO-HSE-SUP-0909 24-HR Emergency Notification Procedure, initiate a calldown until a contact is reached (direct contact must be made, messages cannot be left). Communicate issue and original caller contact information.

7.4 THIRD PARTY MEDIA SUPPORT

Questions may be directed through the Tervita's communications team at 1-866-537-1207. Alternatively, Tervita may contact BEHR Integrated Solutions Inc. at 403-444-6940 for advice on media support.

7.5 TERVITA CORPORATION – INCIDENT SUPPORT TEAM (IST)

Response Team Title (Tervita Title)	Name	Telephone Numbers		
		Office	Cellular	Home
INCIDENT SUPPORT TEAM (IST) DIRECTORSHIP				
Incident Director (VP, Energy Services)	Duane Burkard	403-231-1131	403-990-8676	-
Deputy Incident Director (HSE VP)	Rhonda Rudnitski	403-234-4822	403-803-9943	-
INCIDENT SUPPORT TEAM (IST) COMMAND STAFF				
IST Information Officer (Corporate Communications Manager)	Kelly Sansom	587-233-3639	587-585-6501	-
Alternate IST Information Officer (Sr. Advisor, Communications)	Heather McCartney	403-234-4803	-	-
IST Safety Officer (HSE Manager)	Paul Finnemore	403-301-4623	780-713-9168	-
Alternate IST Safety Officer (HSE Advisor)	Mike Wasylyshen	403-724-7062	403-371-5763	-
IST Liaison Officer (HSE VP)	Ian Radzichowsky	403-231-8432	403-701-5876	-
Alternate IST Liaison Officer (Environmental and Regulatory Manager)	Nelson Liu	403-231-6517	403-826-4396	-
INCIDENT SUPPORT TEAM (IST) OPERATIONS SECTION				
Operations Section Head (Director, Operations)	Vince Lisch	780-875-2445	780-808-9960	-
Alternate Operations Section Head (Director, Operations)	Troy McElgunn	587-233-3455	403-816-8285	-
INCIDENT SUPPORT TEAM (IST) PLANNING SECTION				
Planning Section Head (Director, Engineering)	Todd Gondek	403-231-1108	403-519-1614	-
Technical Specialists	Mobilized as required	-	-	-
Documentation Unit (HSE Technical Assistant)	Steve Henry	403-301-4616	587-215-6610	-
Documentation Unit (Management System Advisor)	Karen Kim	403-231-8806	403-669-6717	-

Response Team Title (Tervita Title)	Name	Telephone Numbers		
		Office	Cellular	Home
INCIDENT SUPPORT TEAM (IST) LOGISTICS SECTION				
Logistics Section Head (Manager, SCM)	Kevin Oriold	587-233-3410	587-577-9954	-
Alternate Logistics Section Head (Advisor, Contractors & Compliance)	Sheehan Mulholland	403-231-1136	403-651-0322	-
Supply Unit Leader (Manager, SCM)	Kevin Oriold	587-233-3410	587-577-9954	-
Alternate Supply Unit Leader (Advisor, Contractors & Compliance)	Sheehan Mulholland	403-231-1136	403-651-0322	-
Communications Unit Leader (VP Information Technology and Systems)	Kelly Sansom	587-233-3639	587-585-6501	-
Alternate Communications Unit Leader (Manager, Database Integration)	Shad Watts	403-231-1114	403-669-3113	-

INCIDENT SUPPORT TEAM (IST) FINANCE/ADMINISTRATION SECTION				
Finance/Administration Section Head (Director, Finance)	Don Kirouac	587-233-3397	403-818-6456	-

SENIOR MANAGEMENT SUPPORT IN THE AREAS OF HUMAN RESOURCES AND LEGAL				
Legal Services and Board Coordinator	Mobilized as required	-	-	-

SECTION 8.0 - FORMS

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

Prompting Questions in Assessing an Incident

- ❒ Is the safety of employees, contractors or responders compromised?
- ❒ As required, refer to SDS or Site-Specific Supplemental Section:

  http://ccinfoweb.ccohs.ca/cheminfo/search.html
- ❒ Is public protection compromised? Consider:
  - ❒ Proximity of the incident to a residence, public facility, surface development, community, population centre, park, campground, recreational area, etc.
  - ❒ Proximity of the incident to transportation corridors (high traffic volume areas, highways, rail lines, etc.).
- ❒ What could be or are any required public protection measures. Refer to the appropriate Provincial/Regulatory Section.
- ❒ What is the prognosis for control and containment of the incident and any related losses?
- ❒ Is there potential for environmental damage? Consider:
  - ❒ Impact on air? Is the hazard unconfined or transient (e.g. uncontrolled release of gas, liquid, hazardous or flammable materials; etc.)?
  - ❒ Impact on land (private or public)?
  - ❒ Impact on fish, wildlife, or habitat?
  - ❒ Release of contaminants into the surrounding water (lakes, rivers, creeks, groundwater, etc.).
- ❒ Are local resources (manpower and equipment) adequate for an effective response?
- ❒ Is the incident particularly controversial or otherwise likely to arouse public and/or media interest?
- ❒ Is the incident site remote/isolated? Does this have particular bearing on site accessibility for the resources (manpower and equipment) necessary for the response?
- ❒ Could the incident involve several impacted government agencies?
- ❒ What are the financial and other business risks posed by the incident? Consider both probability and severity:
  - ❒ Are there any capital losses or replacement costs?
  - ❒ Loss of revenue? For how long?
  - ❒ Significant impact on product deliverability (contractual and customer relations issues)?
  - ❒ Risk of losing investor or partner confidence?
- ❒ Could the incident possibly involve severe regulatory or legal infractions on the part of the corporation or its employees?
- ❒ Is corporate reputation otherwise at risk because of the incident?

Incident Objectives

① Incident Name:

② Date Prepared: (month, day, year)

③ Time Prepared: (24-hour clock)

④ Operational Period: (date/time)

⑤ General Control Objectives for the Incident (Include Alternatives):

Primary Objectives: 1. Responder Safety
2. Public Protection
3. Control and Containment of the Hazard

Other Objectives (What do we want to accomplish?):

⑥ Strategies (**How** are we going to do it?):

⑦ Tactics (**Which** resources we will use and how we will use them to execute strategies?):

⑧ Weather Forecast for Operational Period:

⑩ Attachments: (☑ if attached)

- ☐ Incident Briefing form (ICS Form 201)
- ☐ Incident Action Plan Safety and Risk Analysis Form (ICS Form 215A)
- ☐ _____
- ☐ Weather Forecast
- ☐ _____
- ☐ _____

⑪ Prepared By (Planning Section Chief):

⑫ Approved By (Incident Commander)

Incident Briefing

(Incident Briefing - Page 1 of 5)

① Incident Name:	
② Date Prepared: (month, day, year)	③ Time Prepared: (24-hour clock)
④Map Sketch:	
⑤ Prepared By: (Enter name and position)	**Page 1 of 5**

Incident Briefing

⑥ Summary of Current Actions:
Primary Objectives: 1. Responder Safety 2. Public Protection 3. Control and Containment of the Hazard **Other Objectives:**
Strategies:
Tactics:
Advice and Support Requirements from Emergency Operations Centre (EOC):

⑦ Current Organization

INCIDENT MANAGEMENT TEAM (IMT) ORGANIZATIONAL CHART

ROLE: Manage the Emergency

INCIDENT COMMANDER(S) (Single or Unified)

- **Incident Commander** (NAME: / PHONE:)
  - **Deputy Incident Commander** (NAME: / PHONE:)
    - **Information Officer** (NAME: / PHONE:)
    - **Safety Officer** (NAME: / PHONE:)
    - **Liaison Officer** (NAME: / PHONE:)
      - Petroleum Regulatory Agency
      - Local RCMP/Local Police
      - Local Authorities (Counties/Municipalities/Regional Districts, etc.)
      - Local Health Region/Authority
      - Remaining Government Agencies Outlined on the Notification Matrices in the appropriate Provincial and/or Regulatory Section
    - **Operations Section Chief** (NAME: / PHONE:)
      - ON-SITE: On-site Responder Safety (including site-safety as required); Control and Containment of the Hazard
      - OFF-SITE: Off-site Responder Safety; Public Protection; Environmental Protection
      - Refer to "Operations Section Organization Chart"
    - **Planning Section Chief** (NAME: / PHONE:)
      - Resources Unit Leader (NAME: / PHONE:)
      - Documentation Unit Leader (NAME: / PHONE:)
      - Situation Unit Leader (NAME: / PHONE:)
      - Demobilization Unit Leader (NAME: / PHONE:)
      - Technical Specialists (NAME: / PHONE:)
    - **Logistics Section Chief** (NAME: / PHONE:)
      - Service Branch Director (NAME: / PHONE:)
        - Communications Unit Leader (NAME: / PHONE:)
        - Medical Unit Leader (NAME: / PHONE:)
        - Food Unit Leader (NAME: / PHONE:)
      - Support Branch Director (NAME: / PHONE:)
        - Supply Unit Leader (NAME: / PHONE:)
        - Facilities Unit Leader (NAME: / PHONE:)
        - Ground Unit Leader (NAME: / PHONE:)
    - **Finance/Administration Section Chief** (NAME: / PHONE:)
      - Time Unit Leader (NAME: / PHONE:)
      - Procurement Unit Leader (NAME: / PHONE:)
      - Compensation/Claims Unit Leader (NAME: / PHONE:)
      - Cost Unit Leader (NAME: / PHONE:)

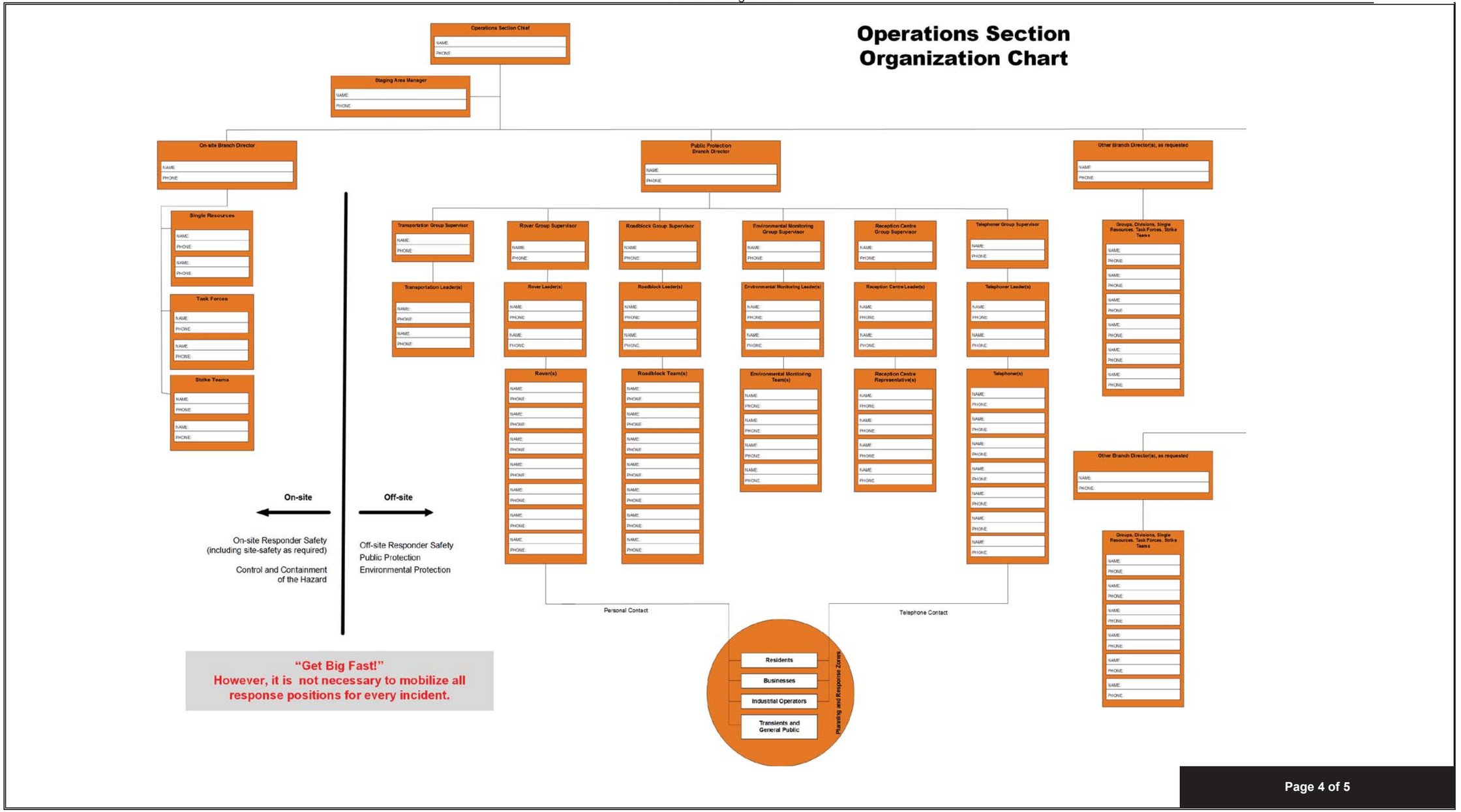
INCIDENT SUPPORT TEAM (IST) ORGANIZATIONAL CHART

ROLE: Provide Advice and Support to the Incident Management Team (IMT)

- **Incident Director** (NAME: / PHONE:)
  - **Senior Management** (NAME: / PHONE:)
  - **Deputy Incident Director** (NAME: / PHONE:)
    - **IST Information Officer** (NAME: / PHONE:)
      - Interfaces With Involved Media
      - Internal Incident-Related Information
    - **IST Safety Officer** (NAME: / PHONE:)
    - **IST Liaison Officer** (NAME: / PHONE:)
      - As requested, supports the Incident Management Team (IMT) with government notifications.
    - **Operations Section Head** (NAME: / PHONE:)
      - Operational Support As Required
      - Resources Unit Leader (NAME: / PHONE:)
      - Documentation Unit Leader (NAME: / PHONE:)
      - Situation Unit Leader (NAME: / PHONE:)
      - Demobilization Unit Leader (NAME: / PHONE:)
      - Technical Specialists (NAME: / PHONE:)
    - **Planning Section Head** (NAME: / PHONE:)
      - Service Branch Director (NAME: / PHONE:)
        - Communications Unit Leader (NAME: / PHONE:)
        - Medical Unit Leader (NAME: / PHONE:)
        - Food Unit Leader (NAME: / PHONE:)
      - Support Branch Director (NAME: / PHONE:)
        - Supply Unit Leader (NAME: / PHONE:)
        - Facilities Unit Leader (NAME: / PHONE:)
        - Ground Unit Leader (NAME: / PHONE:)
    - **Logistics Section Head** (NAME: / PHONE:)
      - Time Unit Leader (NAME: / PHONE:)
      - Procurement Unit Leader (NAME: / PHONE:)
      - Compensation/Claims Unit Leader (NAME: / PHONE:)
      - Cost Unit Leader (NAME: / PHONE:)
    - **Finance/Administration Section Head** (NAME: / PHONE:)

"Get Big Fast!"
However, it is not necessary to mobilize all response positions for every incident.

⑦ Current Organization



Incident Briefing

(Incident Briefing - Page 5 of 5)

⑧ Resource Summary:				
Resources Ordered		**Supplier**	**Status** (See Legend Below)	**Location/Assignment**
Type of Resource	**Number Ordered**			

A=Assigned (In Service) E= Enroute AV=Available (Staged) O=Out of service ETA = Estimated time of arrival

Incident Action Plan Safety and Risk Analysis Form

① Incident Name:	
② Date Prepared: (month, day, year)	③ Time Prepared: (24-hour clock)
④ Prepared By: (Enter name and position)	

DIVISION OR GROUP	POTENTIAL HAZARDS		MITIGATIONS (e.g. personal protective equipment, buddy system, escape routes)
	Type of Hazard	Type of Hazard	

Activity Log

① Incident Name:		
② Date Prepared: (month, day, year)	③ Time Prepared: (24-hour clock)	
④ Prepared By: (Enter name)	⑤ ICS Position:	⑥ Operational Period:

TIME (24-hour clock)	CALL (To or From)	CONTACT	TELEPHONE NUMBER	COMMENTS
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			
	To: ☐ From: ☐			

Demobilization Checkout

① Incident Name:	
② Date Prepared: (month, day, year)/Time Prepared: (24-hour clock)	③ Demobilization Number:
④ Unit/Personnel Released:	
⑤ Transportation Type/Number:	
⑥ Actual Release Date: (month, day, year)/Time (24-hour clock)	⑦ Manifest? ☐ Yes ☐ No Number:
⑧ Destination:	⑨Notified: ☐ Agency ☐Region ☐Area ☐Dispatch
⑩ Unit Leader Responsible for Collecting Performance Rating: (Enter name and position)	

⑪ Unit/Personnel	
You and your resources have been released subject to sign off from the following: *(Demobilization Unit Leader check the appropriate box.)*	
Logistics Section	
☐ Supply Unit	
☐ Communications Unit	
☐ Facilities Unit	
☐ Ground Support Unit Leader	
Planning Section	
☐ Documentation Unit	
Finance Section	
☐ Time Unit	
Other	
☐	

⑫Remarks:

⑬ Prepared By: (Enter name and position)

Facilitating a Briefing Form

① Incident Name:			
② Date Prepared: (month, day, year)		③ Time Prepared: (24-hour clock)	
④ Prepared By: (Enter name and position)			
• Ensure objectives, strategies and tactics are developed and documented. • Ensure each responder is utilizing their response team duty checklist. • Concise briefings are essential and allow responders to share information and expectations. • It is mandatory that the required responders attend briefings. Deputies/Assistants may be mobilized to carry on with the response.		• Attendees must attend briefings from its beginning to end. • Ensure no disruptions occur. (Cellular telephones, other responders, etc. must not interrupt a briefing.) • Announce the time of the next briefing.	
RESPONSE POSITION	**ACTIONS SINCE LAST BRIEFING**	**FUTURE ACTIONS**	**QUESTIONS/CONCERNS**
Incident Commander/ Incident Director			
Deputy Incident Commander/ Deputy Incident Director			
Information Officer/ IST Information Officer			
Liaison Officer/ IST Liaison Officer			
Safety Officer/ IST Safety Officer			
Operations Section Chief/ Operations Section Head			
Planning Section Chief/ Planning Section Head			
Logistics Section Chief/ Logistics Section Head			
Finance/Administration Section Chief/ Finance/Administration Section Head			
Other Responder			

Environmental Monitoring Record

Incident Name:	
Date Prepared: (month, day, year)	Time Prepared: (24-hour clock)
Prepared By: (Enter name and position)	

TIME (24-hour clock)	LOCATION OF SAMPLE	H_2S (ppm)	LEL (%)	O_2 (%)	SO_2 (ppm)	OTHER	TEMP (°C)	WIND CONDITIONS★		COMMENTS
								FROM	SPEED (km/hr)	

Roadblock Checkpoint Record

Incident Name:	
Date Prepared: (month, day, year)	Time Prepared: (24-hour clock)
Prepared By: (Enter name and position)	

VEHICLE TYPE	LICENSE PLATE NUMBER AND PROVINCE	NAME OF DRIVER	NUMBER OF PEOPLE IN VEHICLE	TIME ENTERING THE EMERGENCY PLANNING ZONE	TIME EXITING THE EMERGENCY PLANNING ZONE	COMMENTS

Status Board

Level of Emergency	
Level of Emergency	

Planning and Response Zones			
Site-Specific Supplemental Section In Use			
Size of the Planning and Response Zone		Names of Rivers or Streams	
Number of Roadblocks		Number of School Children	
Number of Residences		Number of Industrial Operators	
Number of Businesses		Number of Trappers	
Number of Public Facilities		Number of Grazing Lessees	

Incident Facilities	
On-site Command Post (OSCP)	
Staging Area(s)	
Incident Command Post (ICP)	
Reception Centre	
Emergency Operations Centre (EOC)	

Government Agency Notification			
Agency Name		**Telephone Number**	**Contacted**
Regulatory Agency			Yes ☐ No ☐
Local RCMP/Local Police			Yes ☐ No ☐
Local Authority(ies)			Yes ☐ No ☐
Health Authority(ies)			Yes ☐ No ☐
Other Government Agencies Outlined on the Appropriate Provincial and/or Regulatory - Notification Matrix			Yes ☐ No ☐
			Yes ☐ No ☐
			Yes ☐ No ☐

ISSUES BOARD

NOTE: Record the "issues" and their resolutions that have arisen as a result of the emergency e.g. unable to locate trappers, a resident requiring evacuation assistance, seismic crew working inside the Emergency Planning Zone.

ISSUE	TIME ISSUE IDENTIFIED	RESPONDER(S) ASSIGNED TO RESOLVE ISSUE	RESOLUTION	TIME ISSUE RESOLVED

Expense Claim Form

Incident Name:	
Date Prepared: (month, day, year)	Time Prepared: (24-hour clock)
Prepared By: (Enter name and position)	
Evacuee's Signature	

Evacuee Information

Date	
Name	
Mailing Address	
City, Province, Postal Code	
Location of Residence, Business, etc.	
Phone	
Phone While Evacuated	
Address While Evacuated	

Expenses (Please attach all receipts)

Accommodation (if not prearranged)	$	
Meals (if not prearranged)	$	
Other Reasonable Daily Expenses	$	
Other	$	
Other	$	
Other	$	
TOTAL		

Bomb Threat Call Report

Date:	Prepared by (your name):
Time: ☐ a.m. ☐ p.m.	Duration of Call:

WHEN A BOMB THREAT IS RECEIVED

Listen	Be calm and courteous	Do not interrupt the caller
Obtain as much information as possible		Initiate call trace action where possible

When caller hangs up attempt to retrieve caller's number by pushing ★**69.**

For telephone tracing, call the local telephone company and the local RCMP/local police.

QUESTIONS TO ASK

What time will the bomb explode?
Where is it?
Why did you place the bomb?
What does it look like?
Where are you calling from?
What is your name?

EXACT WORDING OF THREAT

IDENTIFYING CHARACTERISTICS

Sex :	Estimated Age:	Accent (English, French, Other):
Voice (loud, soft, etc.):		
Speech (fast, slow, etc.):		
Diction (good, nasal, lisp, intoxicated, etc.):		
Manner (calm, emotional, vulgar, etc.):		
Background noises:		

ADDITIONAL INFORMATION

Is the voice familiar (specify)?
Is the caller familiar with the area?
Is the caller familiar with Rally's operation?

OTHER NOTIFICATIONS COMPLETED

☐ local RCMP/local police Time:	☐ _____ Time:	☐ _____ Time:	☐ _____ Time:
☐ _____ Time:	☐ _____ Time:	☐ _____ Time:	☐ _____ Time:

Tervita Handoff Document

Used by: Any Tervita Representative

This form may also be used to transfer wells, pipelines or facilities within various Tervita departments (i.e. Tervita production area transfers to Tervita well department.)

Well, Pipeline or Facility Name: _____

_____

Surface Location: _____

Regulatory Approval Number (Licence, Well Authorization, etc.): _____

Effective Date: _____

Tervita (or one of its affiliates) are preparing to perform work on the above referenced well, pipeline or facility. During these operations, Tervita will be accepting operational and emergency preparedness responsibilities for the above referenced well, pipeline or facility.

NOTE: Once operations are complete, Tervita will ensure the bottom portion of this form is complete.

_____ _____
Signature of Tervita Representative Date

_____ _____
Signature of Contract Operating Company Representative Date

Effective Date: _____

Tervita (or one of its affiliates) has finished work on the above referenced well, pipeline or facility. Tervita has turned operational and emergency preparedness responsibilities for this well, pipeline or facility over to _____(company name).

_____(company name) will now be re-accepting operational and emergency preparedness responsibilities for the above referenced well, pipeline or facility.

_____ _____
Signature of Tervita Representative Date

_____ _____
Signature of Contract Operating Company Representative Date

Public Notification Record

Incident Name:	
Date Prepared: (month, day, year)	Time Prepared: (24-hour clock)
Prepared By: (Enter name and position)	

CONTACT NAME	PUBLIC PROTECTION MEASURE RECOMMENDED (See Legend Below)	NUMBER OF PEOPLE AT LOCATION		ASSISTANCE OR TRANSPORTATION REQUIRED?	COMMENTS
		INSIDE	OUTSIDE		

N = Notification and Voluntary Evacuation E = Evacuation S = Shelter-In-Place

Evacuee Registration Record

Incident Name:	
Date Prepared: (month, day, year)	Time Prepared: (24-hour clock)
Prepared By: (Enter name and position)	Reception Centre Location:

NAME (List All Names In Group)		MAP NO.	TIME (24-hour clock)		DESTINATION		COMMENTS
FIRST	LAST		CHECK- IN	DEPARTURE	LOCATION	PHONE NUMBER	

Public Information Notice

Public Information Notice
Date: _____
ROVERS: Place on unattended vehicles (Ensure the notice is placed inside a plastic bag and secured to the windshield.) and give to all public inside your Rover Area when notification has been ordered. *(Fill in date*.)
Tervita Corporation has an emergency at its nearby oil and gas facility. All efforts are being made to solve the problem. You are in no danger at this time; we are notifying you for informational purposes only.
If conditions worsen, Tervita will initiate evacuation of the area. At that time, Tervita will need to locate anyone living, working, camping or using the area.
If you have any questions, call Tervita at ___-___-____.
Thank you

Public Evacuation Notice

Public Evacuation Notice

Date: _____

ROVERS: Place on unattended vehicles (Ensure the notice is placed inside a plastic bag and secured to the windshield.) and give to all public inside your Rover Area when evacuation has been ordered. *(Fill in date*.)

Tervita Corporation has an emergency at its nearby oil and gas facility. As a safety precaution, please **evacuate** the area.

Rover as required, check one of the two bullets below and if required fill in the blank:

- ❒ Tervita has established a Reception Centre at the _____, proceed to this location; or
- ❒ Tervita has not established a Reception Centre and asks you to evacuate, seek reasonable alternate accommodation of your choice and contact the number below when you have relocated.

If you have any questions, call Tervita at ___-___-____.

Thank you

Notification Message

☑	Notification Message
☐	Hello this is (your name) _____ of Tervita Corporation.
☐	Is this the (name) _____ residence/business at _____ (telephone number)?
☐	We are responding to a problem at _____ (well, facility, etc.) in the area.
☐	All efforts are being made to solve the problem.
☐	**You are in no danger at this time; we are notifying you for informational purposes only.**
☐	Do you understand this message? **NOTE: If the contact wants to voluntarily evacuate, instruct the contact to either proceed to the Reception Centre if established or seek reasonable alternate accommodation of his/her choice if no Reception Centre is established. If the contact is seeking reasonable alternate accommodation of his/her choice, obtain a contact telephone number where Tervita can reach him/her.**
☐	In order to keep the telephone lines open for emergency use, do not use your telephone for non-emergency calls.
☐	Again my name is _____ and my phone number is _____.
☐	Thank you for your co-operation.
Immediately pass on all information regarding this call to your supervisor. **Tervita's emergency number is 1-800-327-7455.**	

Evacuation Message

☑	Evacuation Message
☐	Hello this is (your name) _____ of Tervita Corporation.
☐	Is this the (name) _____ residence/business at _____ (telephone number)?
☐	We are responding to a serious problem at _____ (well, facility, etc.) in the area.
☐	You are in no danger at this time, but if a release occurs, the wind will carry the gas in a _____ (north, south, east, west) direction from the incident site.
☐	For your safety, you must leave your location immediately and go to the Reception Centre (if established) at the _____ (hall, office, hotel).
☐	The Reception Centre is located at _____ (give directions and address).
☐	How many people are in your location right now? _____
☐	Is there anyone outside that you cannot contact easily? (☐ Yes / ☐ No) **If YES: Determine the location and assure the contact you will send someone to find them.**
☐	Do you have your own transportation? (☐ Yes / ☐ No) **If NO: Assure them that you will send someone to pick them up. While they are waiting, advise them to close their windows and doors and remain indoors.**
☐	Please: • Leave immediately. • If school is in session, the school buses will deliver the children to the Reception Centre (is established) when the school day is over.
☐	Do you understand these instructions?
☐	Are you leaving immediately?
☐	Just to be sure, which way are you going to travel?
☐	If for some reason a problem arises and you can't leave, call me back.
☐	In order to keep the telephone lines open for emergency use, do not use your telephone for non-emergency calls.
☐	Again my name is _____ and my phone number is _____.
☐	Thank you for your co-operation.
Immediately pass on all information regarding this call to your supervisor. **Tervita's emergency number is 1-800-327-7455.**	

Shelter-In-Place Message

☑	Shelter-In-Place Message
☐	Hello this is (your name) _____ of Tervita Corporation.
☐	Is this the (name) _____ residence/business at _____ (telephone number)?
☐	We are responding to a serious problem at _____ (well, facility, etc.) in the area.
☐	All efforts are being made to solve the problem. However, for your safety, it is extremely important that you and those with you stay indoors until the hazard no longer exists, or you are advised to evacuate.
☐	To help us understand your immediate needs we need to know: • How many people are at your location now? (adults) _____ (children) _____. • Is there anyone you cannot contact to get indoors? (☐ Yes/ ☐ No) **IF YES**: Ask the contact the location of the person(s) _____. Assure the contact that we will be sending someone to find them.
☐	Do you have the Shelter-In-Place instructions previously given to you? (☐Yes / ☐ No)
☐	**IF YES**: Request the contact to follow the Shelter-In-Place instructions.
☐	**IF NO**: Request the contact to take the following actions immediately: • Close and keep closed all windows and outside doors. • Shut off air intake fans which exhaust outdoors (dryer, stove vents, bathroom fans, air condition, etc.). • Turn off heat and hot water pilot lights. • Extinguish fires in fireplaces. • Gather everyone in an interior room upstairs and stay there.
☐	A company representative will come to your location when the hazard has been cleared.
☐	Do you understand these instructions?
☐	We will frequently update you about the situation.
☐	In order to keep the telephone lines open for emergency use, do not use your telephone for non-emergency calls.
☐	If you have any questions, call our emergency number ___-___-____ and identify yourself as a Sheltered-In-Place resident.
NOTE:	**If the contact is very determined to evacuate when you are recommending Shelter-In-Place, calmly explain that it is more hazardous to evacuate because the indoor concentrations will be significantly lower than outdoor levels. The safest action is to remain Sheltered-In-Place until the hazard is removed.**
Immediately pass on all information regarding this call to your supervisor. **Tervita's emergency number is 1-800-327-7455.**	

Automated Telephone Notification System Messages

Notification Message
This is Tervita calling with an important message. Tervita has an emergency near your location, which does not affect your safety; REPEAT, does not affect your safety. You are in no danger at this time; Tervita is notifying you for informational purposes only. If you would like to voluntarily evacuate, please go to the Tervita Reception Centre located at the _____. For further information, please contact Tervita's 24-hour emergency number at 1-800-327-7455. Thank you.
• ***Press 1*** *to replay the message.* • ***Press 2*** *to request assistance and have a Tervita representative contact you.* • ***Press 3*** *to confirm receipt of this message.*

Evacuation Message
This is Tervita calling with an important message. Tervita has an emergency near your location. We are advising you to evacuate the area. Please evacuate your residence/business and proceed directly to the Tervita Reception Centre located at the _____. It is very important that you check in with the Tervita representative at the Reception Centre. For further information, please contact Tervita's 24-hour emergency number at 1-800-327-7455. Thank you.
• ***Press 1*** *to replay the message.* • ***Press 2*** *to request assistance and have a Tervita representative contact you.* • ***Press 3*** *to confirm receipt of this message.*

Automated Telephone Notification System Messages

Shelter-In-Place Message
This is Tervita calling with an important message. Tervita has an emergency near your location. Take shelter inside your home. **PLEASE DO NOT EVACUATE YOUR RESIDENCE/BUSINESS AT THIS TIME.** Close all doors and windows and shut off any sources of outside air. If possible, shut off or plug any air intakes or exhaust fans, e.g. stove fan, bathroom vent, clothes dryer, air conditioner. Avoid unnecessary use of your telephone so that we can contact you again. Tervita will advise you via telephone or in person when it is safe to evacuate. For further information, please contact Tervita's 24-hour emergency number at 1-800-327-7455. Thank you.
• ***Press 1*** *to replay the message.* • ***Press 2*** *to request assistance and have a Tervita representative contact you.* • ***Press 3*** *to confirm receipt of this message.*

Resident Message – All Clear
This is Tervita calling with an important message. This is an ALL CLEAR message from Tervita. The emergency near you has been corrected. We apologize for any inconvenience that we may have caused. For further information, please contact Tervita's 24-hour emergency number at 1-800-327-7455. Thank you.
• ***Press 1*** *to replay the message.* • ***Press 2*** *to request assistance and have a Tervita representative contact you.* • ***Press 3*** *to confirm receipt of this message.*

Automated Telephone Notification System Messages

Resident Message – Test Message
This is Tervita calling with an automatically issued message. This is Tervita calling with a test message. This is **not** an emergency. This is only a test. In an emergency, you would be given specific instructions or information. For further information, please contact Tervita's 24-hour emergency number at 1-800-327-7455. Thank you.
• ***Press 1*** *to replay the message.* • ***Press 2*** *to request assistance and have a* Tervita *representative contact you.* • ***Press 3*** *to confirm receipt of this message.*

School Children Registration Record

Family Name:	Family Telephone Number:

Student Arrival

List all students in the family arriving by school bus.

Students	Arrival Time	Signatures	
		School Bus Driver	Reception Centre Personnel
1.			
2.			
3.			
4.			

Parent Contact

Parents Contacted? ☐ Yes ☐ No Time: a.m./p.m.

Contacted by:

Estimated Pickup Time: a.m./p.m.

Temporary Care

Are care arrangements necessary? ☐ Yes ☐ No

Location of temporary care:

Phone Number:

Contact Person:

Student Release

List all students in the family being released to parents.

Students	Release Time	Signatures	
		School Bus Driver	Reception Centre Personnel
1.			
2.			
3.			
4.			

CORE EMERGENCY RESPONSE PLAN

SECTION 9.0 - SAFETY EQUIPMENT

CONTENTS

This emergency response plan can be utilized by Tervita and all of its affiliated companies.

9.0 SAFETY EQUIPMENT

9.1 EMERGENCY RESPONSE SAFETY EQUIPMENT

The safety equipment listed on the following pages is necessary for implementing this emergency response plan and maximizing public protection. This plan is not intended to outline other safety equipment that may be necessary for unique on-site responder safety operations.

9.2 ROADBLOCK KITS

Each roadblock kit should contain the following items:

- Vehicle-mounted rotary beacon
- Stop paddle
- Flashlight
- Fluorescent vest
- Traffic cones
- Roadblock Checkpoint Records
- Pens/pencils

NOTE: Each Roadblock Team member should also have a map showing the planning and response zones and their assigned roadblock location (may be sent via smart telephone); and will have direct communication capability with their supervisor (e.g. radio, cellular telephone).

Attachment 7
Fire Plan

Tervita Environmental Services

Office Fire Safety Plan

999 – Redonda Street
Winnipeg, MB

May 2020

Version 1

Contents

1. INTRODUCTION

This Fire Safety Plan is intended to provide the information and procedures required to effectively respond to a fire related emergency. It is the responsibility of all occupants to review the Fire Safety Plan and to become familiar with the Procedures and information contained within. All Tervita Fire Wardens and Health, Safety and Environment (HSE) Manager must retain a copy of the Fire Safety Plan.

The implementation of the Fire Safety Plan helps to ensure effective utilization of life safety features in a building to protect people from fire. The required Fire Safety Plan should be designed to suit the resources of each individual building or complex of buildings. It is the responsibility of the owner to ensure that the information contained within the Fire Safety Plan is accurate and complete.

This official document is always to be kept readily available for use by staff and fire officials in the event of an emergency.

The fire safety plan approved location is:

1. Front Lobby of Administration Building
2. Lunch room of Warehouse
3. Copy obtained from Fire Warden's listed in document

The Fire Department will be notified regarding any subsequent changes in the reviewed Fire Safety Plan. Contact the Fire Department at (204) 444-2133

2. AUDIT OF BUILDING RESOURCES CHECKLIST

Occupancy Type Commercial

Occupant Load

Occupant Load: (if applicable) 20

Access

Designated Fire Route: ☐ No ☒ Yes

Nearest Municipal Hydrant Location: _____

Private Hydrants: ☐ No ☒ Yes (Location(s)): Border Chemical
Sandvik

Lockbox: ☐ No ☒ Yes (Location(s)): North of Gate to Warehouse

_____

Heating ☒ Natural Gas ☒ Electric ☐ Other _____

Main Gas Shut-off: ☐ No ☒ Yes (Location(s)): SE Corner of Warehouse and also remote stand near garage

Main Electrical Shut-off Location: Panels located in warehouse and outside on east side of warehouse

Main Domestic Water Shut-off Location: _____

Fire Alarm System:

Make: honeywell Notifier
Model: NFS-320C
Main Panel Location: NE corner of Warehouse
Annunciator Panel Location: NE corner of Warehouse
Fire Alarm Description: Alarm monitored by Protelec and inspected by Vipond

Sprinkler System: ☐ No ☒ Yes Type: ☒ Wet ☐ Dry ☐ Other _____

Connected to the Fire Alarm System: ☐ No ☒ Yes
Location of Sprinkler Room/Shut Off Valves:
NE corner of Warehouse building

Standpipe System: ☒ No ☐ Yes

Location of Shutoff/Isolation Valves: _____

Fire Department Connection: ☒ No ☐ Yes (Location(s)): _____

_____

Fire Pump: ☒ No ☐ Yes (Location(s): _____

Fire Pump Description: _____

_____

Other Extinguishing Systems:

Type (i.e. pre-action, sprinkler, halon, inergen, dry chemical):	Area/Location Protecting
_____	_____
_____	_____
_____	_____
_____	_____

Portable Fire Extinguishers: (Refer to schematic drawings)
To be determined once we move in

Emergency Lighting

☐ No ☒ Yes Location(s): Above exterior man doors

Emergency Power

☐ No ☐ Yes ☐ Battery ☒ Generator

Generator

☒ Diesel ☐ Natural Gas

Fuel Supply Location: Tank behind generator

Transfer Switch Location: _____

Equipment Powered by Generator: Fire Suppression

_____

_____

Electromagnetic Locking Devices

☐ No ☐ Yes (manual release switch location) _____

Proper Signage (Example – no parking signs, fire lane signage, no storage, emergency procedures, 911 signage at manual pull stations)

☐ No ☐ Yes

Location(s) throughout building: _____

_____

_____

_____

Extra Hazardous Area:

Is there hazardous materials on site? ☐ No ☒ Yes

If YES, please list the material and quantity:

An inventory list of the waste types and quantity in the transfer station is maintained electronically as products are inbound and outbound frequently. A current list can be pulled at site by staff or remotely from another Tervita office.

Exits: Refer to schematic drawings for location of exits.
To be updated once we move in

3. AUDIT OF HUMAN RESOURCES

Business/Building Name:	Tervita Corporation
Address:	1600, 140 10th Ave. SE Calgary Alberta
Postal Code:	T2G 0R1 Business Phone No. 1-855-837-8482
Business Owner:	Neil MacDonald
Address:	999 Redonda Street; Winnipeg Manitoba
Postal Code:	R3C 3R9
Phone Number(s):	204-832-4561

After Hour Contacts (24 hour telephone numbers):1-800-327-7455

Manager/Supervisor:	Darryll Champagne Phone No. 204-791-3914
Employee/Title:	Eric Laviolette / Operations Manager Phone No. 204-981-9301
Employee/Title:	Rick Ridley / General Superintendent Phone No. 204-995-8242
Other:	Neil MacDonald Phone No. 204-801-1929
Building Owner:	Xpotential Products Inc.
Address:	PO Box 126, St Boniface Postal Station,
Postal Code:	R2H 3B4 Phone No. 1-204-781-3224

Fire Alarm Monitoring Company: Protelec Phone No.: 1-204-949-1417

Sprinkler Monitoring Company: Vipond Phone No.: 1- 204 783-2420

4. FIRE EMERGENCY PROCEDURES

IN CASE OF FIRE

Upon Discovery of Fire:

- Leave fire area immediately and close doors
- Sound Fire Alarm
- Call the Fire Department at 9-1-1
- Leave building via nearest Exit
- Await the arrival of the Fire Department at the muster point
- In the event of a small fire, floor Wardens or employees trained in the use of Fire Extinguishers may attempt to extinguish it and MUST have at least one partner

Upon Hearing Fire Alarm:

- Supervisor/ Fire Warden retrieve Air Horn (located at To be determined once we move in) and sound the horn **3 times** to alert all workers/staff within the vicinity
- Leave building via nearest Exit
- Close doors behind you
- Walk, DO NOT RUN, to the designated **Muster Area** located at: Main Gate at Redonda
- ASSIST persons requiring assistance
- Once you have left the fire area, DO NOT RETURN TO IT
- Conduct a Head Count
- Await the arrival of the Fire Department at the muster point

CAUTION

IF YOU ENCOUNTER SMOKE - USE AN ALTERNATE EXIT

Remain Calm

4.1. Fire Warden's / Supervisory Staff Procedure & Responsibilities

Fire Wardens must be trained in the Fire Emergency and Fire Warden's Procedures before they are given any responsibility for fire safety, which includes becoming familiar with all other Fire Wardens and the building including: floor area, exits, fire alarms and location of fire extinguishers (refer to attached Floor Plan).

Fire Warden's Procedure

1. Retrieve Air Horn (located -TBD once we move in) and sound the horn 3 times to alert all workers/staff within the vicinity
2. Ensure exits are unobstructed and there is no smoke in stairway, use alternate exit if needed.
3. Direct occupants to the nearest exits.
4. If safe to do so, Check all areas, as occupants are evacuating (washrooms, printer rooms, offices, conference rooms, lunch rooms etc.), to ensure no individuals have been left behind.
5. Assign persons as necessary for each Special Needs Persons, if applicable.
6. Retrieve the Sign In/Out binders (at main entrance) and take while exiting for head count.
7. Exit the floor and proceed to the designated **Muster Area** located in the east entrance of the property, main entrance to 999 Redonda.
8. Direct employees to remain calm and take a head count and compare to the Sign in/out sheet and the Visitor sign in/out sheet. Inform the Fire Department of any confirmed missing occupants and that there may be unidentified Field Technicians or Mechanics inside.
9. Report in writing the events that took place for immediate investigation (refer to attached Incident Statement Form).

Fire Warden's Responsibility

Upon Discovery of Fire

- Leave fire area immediately and close doors. Alert occupants.
- Sound Fire Alarm and follow the fire alarm evacuation procedures.
- Call 9-1-1 from a safe location.
- Exit the building via the nearest exit.
- Await the arrival of the Fire Department at the muster point.

Upon Hearing of a Fire Condition

- Ensure that the other occupants have been notified of the emergency conditions.
- Notify the Fire Department of the emergency condition. Dial 9-1-1.
- If it is safe to do so, supervise the evacuation of all occupants, including those requiring assistance.
- Upon the arrival of the firefighters, inform the fire officer of the conditions in the building and coordinate the efforts of the Supervisory staff with those of the Fire Department.
- Provide access and vital information to the firefighters as to location of persons, master keys for this occupancy and service rooms, etc.

General Related Duties

- Keep the doors in fire separations closed at all times.
- Keep access to exits and EXITS, inside and outside, clear of any obstructions at all times.
- Do not permit combustible materials to accumulate in quantities or locations that would constitute a fire hazard.
- Promptly remove all combustible waste from areas where waste is placed for disposal, if applicable.
- Keep access roadways, fire routes and fire department connections clear and accessible for fire department use.
- Maintain the fire protection equipment in good operating condition at all times.
- Participate in fire drills. Occupants' participation should be encouraged.
- Have a working knowledge of the building fire and life safety systems.
- Ensure the building fire and life safety systems are in operating condition.
- Arrange for a substitute in your absence.
- Comply with the Manitoba Fire Code.
- In the event of any shutdown of fire and life safety systems, notify the Fire Department and initiate alternative measures.

Fire Wardens:

Administration Building	
Connie Gratton	Contact: (204) 956-9021
Alternate – Jennifer Alex	Contact: (204) 336-5448
Warehouse	
Cole Thorarinson	Contact: (204) 336-5449
Alternate- to be appointed	Contact:

4.2. Special Needs Persons

Special Needs Persons are those occupants who may have either cognitive or physical limitations, which may require special assistance evacuating in the event of a Fire Emergency. Examples include: handicap people, pregnant women and persons with injuries. The Fire Warden(s) in charge is(are) to appoint individuals who are capable of assisting Special Needs Persons.

4.3. Responsibilities of the Owner / Occupant

The building owner/occupant has numerous responsibilities related to fire safety and must ensure that the following measures are enacted:

- Established emergency procedures to be followed at the time of an emergency.
- Appointment and organization of designated supervisory staff to carry out safety duties.
- Instruction of supervisory staff and other occupants so that they are aware of their responsibilities for fire safety.
- Holding of fire drills in accordance with the Fire Code, incorporating Emergency Procedures appropriate to the building.
- Control of fire hazards in the building.
- Maintenance of building facilities provided for safety of the occupants.
- Provisions of alternate measures for safety of occupants during shut down of fire protection equipment.
- Assuring that checks, tests and inspections required by the Manitoba Fire Code are completed on schedule and that records are retained for a minimum period of two (2) years.
- **Assuring that initial verification or test reports for fire protection systems are retained throughout the life of the systems.**
- Post and maintain at least one (1) copy of the fire emergency procedures.
- Keep a copy of the approved Fire Safety Plan on the premises in an approved location.

- Notification of the Fire Chief regarding changes in the Fire Safety Plan.
- Ensure that the information in the Fire Safety Plan is current.
- Designate and train sufficient alternates to replace supervisory staff during any absence.

5. FIRE HAZARDS

Industrial Properties

A high standard of housekeeping and building maintenance is probably the most important single factor in the prevention of fire. Listed below are some specific hazards.

- Combustible material stored in non-approved areas.
- Fire and smoke barrier door not operating properly or wedged open.
- Improper storage of flammable liquids and gases.
- Defective electrical wiring and appliances, over-fusing, and the use of extension cords as permanent wiring.
- Clothes dryer lint collector full or improperly vented.
- Careless use of smoking materials.
- Improper disposal of oily rags.
- Spark from adjacent rail line

In general, occupants should:

- Know how to alarm occupants of building, know where exits are located.
- Call the Fire Department immediately (9-1-1) whenever you need assistance.
- Know the correct address of the building or precise geographical location of the facility.
- Notify the building/property management if special assistance is required in the event of an emergency.
- Know the fire alarm signals and the procedures established to implement safe evacuation.
- Know the supervisory staff in your building.
- Report any fire hazard to supervisory staff.
- Know stairwell designation and the crossover floors (if any).
- Maintain properties drainage plan, lawncare and snow removal upto the rail R.O.W

5.1. Control of Fire Hazards

Fires can occur in the workplace for a variety of reasons. Workers need to identify flammable or combustible materials that are potential fire hazards in their work areas, and control potential ignition sources through effective housekeeping procedures. In the event of a fire situation, workers need to react effectively and, if possible, use portable fire extinguishers to attack an incipient stage fire.

Operational Controls

• Adhere to housekeeping procedures to limit the risk of fires (i.e., minimize storage of combustible materials, dispose of combustible waste in metal containers that are

covered and airtight, turn off electrical equipment when not in use, etc.) as identified in CO-HSE-STN-0714 Fire and Explosion Control.

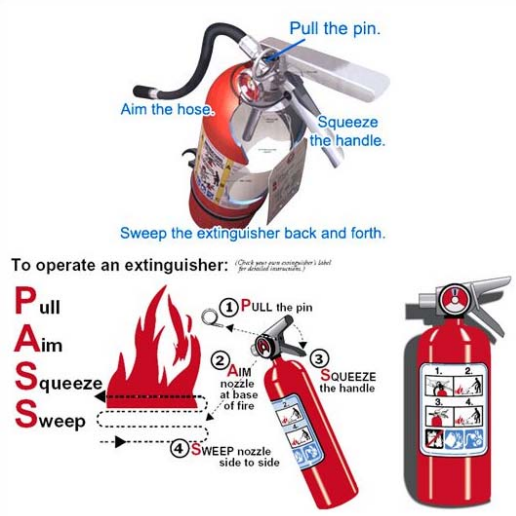
• Adhere to fire prevention strategies (i.e., adequately ventilate buildings in which flammable or combustible liquids are handled or stored, properly dispose of oily waste to avoid spontaneous combustion, etc.) as outlined in CO-HSE-SUP-0725 Fire Safety Inspection Checklist.

• Control the following workplace fire hazards:
  o Electrical fire hazards.
  o Portable heaters.
  o Office fire hazards.
  o Cutting, welding, and open flame work hazards.
  o Flammable and combustible materials.

6. FIRE EXTINGUISHMENT, CONTROL OR CONFINEMENT

In the event a small fire cannot be extinguished with the use of a portable fire extinguisher or the smoke presents a hazard for the operator, the door to the area should be closed to confine and contain the fire. Leave the fire area. Ensure that the Fire Alarm System has been activated and that Fire Department has been notified prior to an attempt to extinguish the fire. Only those persons who are trained and familiar with extinguisher operation may attempt to fight the fire.

Suggested Operation of Portable Fire Extinguishers



Never re-hang extinguishers after use. Ensure they are properly recharged by a person that is qualified to service portable fire extinguishers and that a replacement extinguisher is provided.

Keep extinguishers in a visible area without obstructions around them.

NOTE: Prior to using a K-type extinguisher, activate the kitchen extinguishing system to avoid electrocution.

7. ALTERNATIVE MEASURES FOR OCCUPANT FIRE SAFETY

In the event of any shut-down of fire protection equipment systems or part thereof, in excess of 24 hours, the fire department shall be notified in writing. Occupants will be notified and instructions will be posted as to alternative provisions or actions to be taken in case of emergency. These provisions and actions must be acceptable to the Fire Marshal.

All attempts to minimize the impact of malfunctioning equipment will be initiated. Where portions of a sprinkler or fire alarm system are placed out of service, service to remaining portions must be maintained, and where necessary, the use of watchmen, bull-horns, portable radios, employed to notify concerned parties of emergencies. Assistance and direction for specific situations will be sought from Fire Department.

Procedures to be followed in the event of shutdown of any part of a fire protection system are as follows:

1. Notify Fire Department, dial (204) 444-2133 (DO NOT USE 911). Give your name, address and a description of the problem and when you expect it to be corrected. Fire Department is to be notified in writing of shutdowns longer than 24 hours.
2. Post notices at all exits and the main entrance, stating the problem and when it is expected to be corrected.
3. Maintain fire watch in affected area(s) as per Basic Watchman Service Conditions. Basic Watchman Service conditions can be found on RM of Springfield Fire Department website.
4. Notify Fire Department and the building occupants when repairs have been completed and systems are operational.

Note: All shutdowns will be confined to as limited an area **and** duration as possible.

7.1. Fire Drills

Emergency response training (internal and external) and the execution of tabletop and mock drills is a crucial component to ensuring Tervita's effective and timely response in the event of an emergency. Frequency, type, and magnitude of training exercises shall adhere to specific requirements of jurisdictional OH&S and industry regulations.

At a minimum, Table Top exercises are to be conducted annually and documented on Tervita's CO-HSE-SUP-0914 Table Top Evaluation Form and Fire Drills

Biannually and documented on CO-HSE-SUP-0904Emergency Drill Evaluation Form.

7.2. Inspection and Maintenance

Inspection, testing and maintenance of fire safety equipment within the building must be completed as per equipment specifications and alarm monitoring service. Further information can be found in Tervita's CO-HSE-STN-0714 Fire and Explosion Prevention.

Check/test/inspect requirements of the Manitoba Fire Code:

- Below is a list of the portions of the Fire Code that requires checks, inspections and/or tests to be conducted of the facilities
- Safety Codes Officers may check to ensure that the necessary checks, inspections and/or tests are being done, when conducting their inspections.

Definitions for key words are as follows:

Check means visual observation to ensure the device or system is in place and is not obviously damaged or obstructed

Test means the operation of a device or system to ensure that it will perform in accordance with its intended operation or function

Inspect means physical examination to determine that the device or system will apparently perform in accordance with its intended function

It is stated in the Fire Code that records of all tests and corrective measures are required to be retained for a period of two years after they are made.

7.2.1. General Fire Protection Systems/Equipment

General	**Responsibility**
Doors in fire separations shall be **checked** as frequently as necessary to ensure that they remain closed.	_____
Exit signs shall be clearly visible and maintained in a clean and legible condition.	_____
Internally illuminated exit signs shall be kept clearly illuminated at all times, when the building is occupied.	_____
Weekly	
When subject to accumulation of combustible deposits, hoods, filters and ducts shall be **checked** weekly and be cleaned when such deposits create an undue fire hazard.	_____
Monthly	
Doors in fire separations shall be **inspected** monthly for proper operation.	_____
Yearly	
Fire dampers and fire-stop flaps shall be **inspected** annually, or based on a schedule via contractor acceptable to the Fire Marshal. (fire dampers to be inspected and documented internally monthly as well)	_____
Every chimney, flue and flue pipe shall be **inspected** annually and cleaned as often as necessary to keep them free from accumulations of combustible deposits.	_____
Disconnect switches for mechanical air-conditioning and ventilating systems shall be **inspected** annually to establish that the system can be shut down.	_____
Spark arresters shall be cleaned annually or more frequently where accumulations of debris will adversely affect operations. Burnt-out arresters shall be repaired or replaced.	_____

7.2.2. Portable Fire Extinguishers

General	**Responsibility**
Each portable extinguisher shall have a tag securely attached to it showing the maintenance or recharge date, the servicing agency and the signature of the person who performed the service.	____
A permanent record containing the maintenance date, the examiner's name and a description of any work or hydrostatic testing carried out shall be prepared and maintained for each portable extinguisher.	____
All extinguishers shall be recharged after use or as indicated by an inspection or when performing maintenance. When recharging is performed, the recommendations of the manufacturer shall be followed.	____
Monthly	
Portable extinguishers shall be inspected monthly.	____
Yearly	
Extinguishers shall be subject to maintenance not more than one year apart or when specifically indicated by an inspection.	____
Maintenance procedures shall include a thorough examination of the three basic elements of an extinguisher: a) mechanical parts b) extinguishing agent c) expelling means	____
Every twelve months, pump tank water, and pump tank calcium chloride base antifreeze types of extinguishers shall be recharged with new chemicals or water, as applicable	____
5 Years	
Every five years, pressurized water and carbon dioxide fire extinguishers shall be hydrostatically tested.	____
6 Years	
Every six years, stored pressure extinguishers that require a 12 year hydrostatic test shall be emptied and subjected to the applicable maintenance procedures.	____

7.2.3. Fire Alarm

General	**Responsibility**
Fire alarm and voice communication system components shall be kept unobstructed.	_____
Fire alarm shall be kept unobstructed.	_____
Fire alarm system power supply disconnect switches shall be locked on in an approved manner.	_____

Daily

The following daily checks shall be conducted. If a fault is established, appropriate corrective action shall be taken.

a) **Check** the principle and remote trouble lights for trouble indication;	_____
b) **Inspection** of the AC power-on light shall be done to ensure its normal operation.	_____

Monthly

Every month the following **tests** shall be conducted under battery back up power and if a fault is established, appropriate corrective action shall be taken:

a) one fire alarm initiating device shall be operated, on a rotating basis, and shall initiate an alarm condition	_____
b) function of all signal devices shall be ensured	_____
c) the annunciator panel shall be checked to ensure correct annunciation	_____
d) intended function of the audible and visual trouble signals shall be ensured	
e) fire alarm batteries shall be checked to ensure that:	_____
i) terminals are clean and lubricated where necessary;	_____
ii) terminal clamps are clean and tight;	_____
ii) electrolyte level and specific gravity, where applicable, meet manufacturer's specifications	

Monthly (continued) **Responsibility**

Voice paging capability to one zone shall be **tested** monthly on a rotational basis. _____

One emergency telephone shall be **tested** monthly on a rotational basis for operation and correct indication at control unit. _____

Loudspeakers shall be **tested** monthly as an all-call signal to ensure they function as intended. _____

At least one Firefighter's emergency telephone shall be **tested** monthly on a rotational basis to ensure communication with the control unit. All telephones shall be **tested** each year. _____

Yearly

Yearly **tests** conducted by a qualified person acceptable to Fire Prevention Branch and holding a valid permit from the Fire Prevention Branch _____

Tests
Shall be conducted and documented in conformance with CAN/ULC S536-04, "Inspection and Testing of Fire Alarm Systems".

Voice communications between floor areas and the central alarm control facility shall be **tested** annually, as required for fire alarm initiating and signally devices. _____

7.2.4. Smoke Alarms

General	**Responsibility**
Ensure dwelling unit smoke alarms are maintained in operating condition.	_____
Ensure a copy of the smoke alarm manufacturer's Maintenance instructions or approved alternative has been provided.	_____

(smoke alarms to be inspected and documented monthly internally)

7.2.5. Sprinkler Systems (Wet)

General	**Responsibility**
Auxiliary drains shall be **inspected** as required to prevent freezing.	_____
Weekly	
Except for electrically supervised valves, all valves controlling water supplies to sprinklers and alarm connections shall be **checked** weekly to ensure that they are sealed or locked in the open position.	_____
Water supply pressure and system air or water pressure shall be **checked** weekly by using gauges to ensure that the system is maintained at the required operating pressure.	_____
Monthly	
Inspect gauges control valves & tamper switches. (sprinkler heads to be visually inspected and documented monthly internally)	_____
Three Month	
Inspect alarm devices, hydraulic nameplate and fire department connections All transmitters and alarm devices shall be **tested** at 3 month intervals.	_____
Six Months	
Gate-valve supervisory switches and other sprinkler system supervisory devices shall be **tested** at six month intervals.	_____

General	**Responsibility**
Yearly	
Exposed sprinkler piping hangers shall be **checked** yearly to ensure that they are kept in good repair.	_____
Sprinkler heads shall be **checked** at least once per year to ensure that they are kept in good repair.	_____
Sprinkler heads shall be **checked** at least once per year to ensure that they are free from damage, corrosion, grease, dust, paint, or whitewash. They shall be replaced where necessary as a result of such conditions.	_____
On wet sprinkler systems, water-flow alarm **test** using the most hydraulically remote test connection, shall be performed annually.	_____
Sprinkler system water pressure shall be **tested** annually or after any sprinkler system control valve has been operated, with the main drain valve fully open, to ensure that there are no obstructions or deterioration of the main water supply.	_____
Plugs or caps on Fire Department connections shall be removed annually and the threads inspected of wear, rust or obstruction. Re-secure plugs or caps, wrench tight. If plugs or caps are missing, examine the Fire Department connection for obstructions, back flush if necessary and replace plugs or caps.	_____

7.2.6. Emergency Lighting System

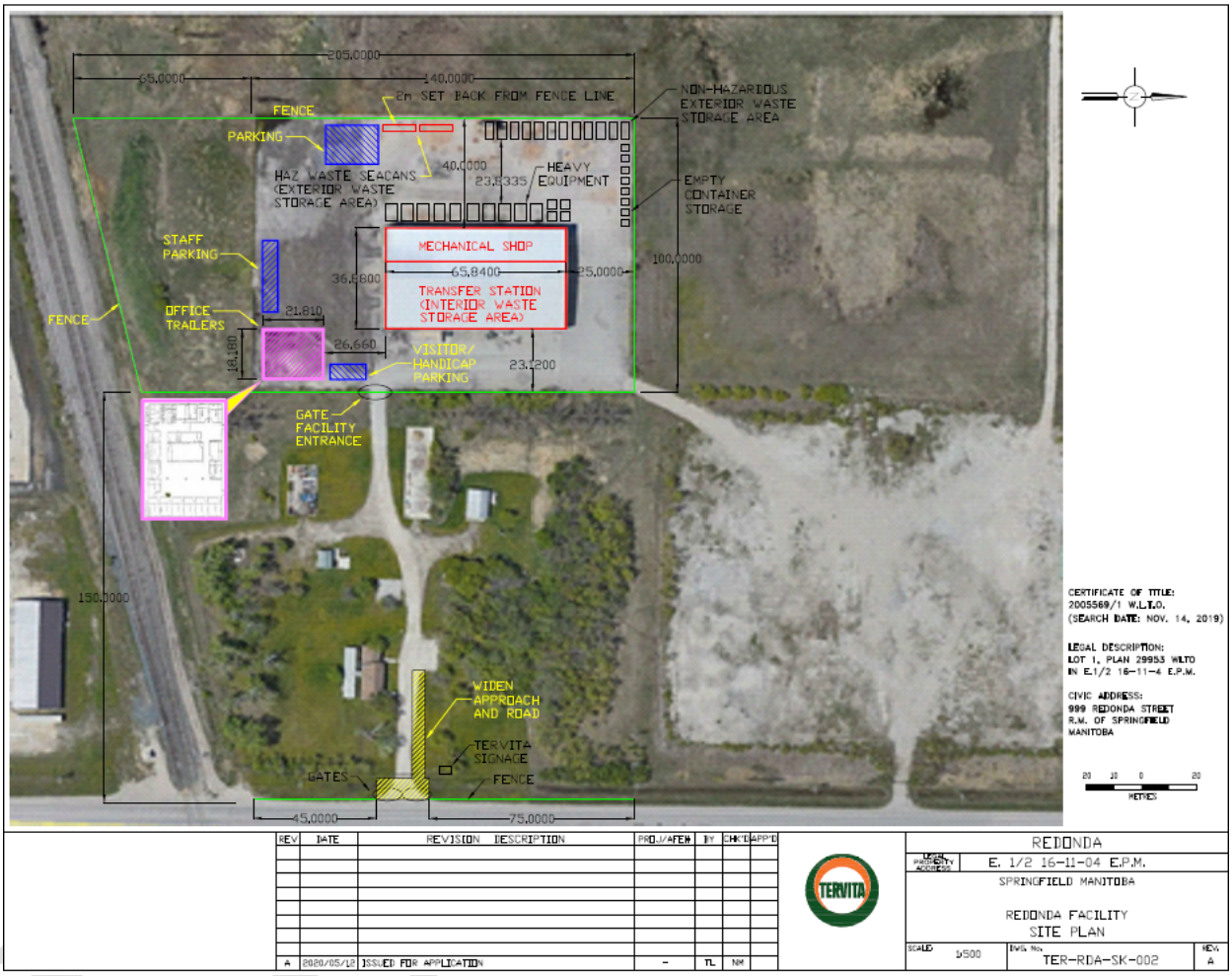
General	**Responsibility**
Daily	
Check POWER ON lights for indication of proper operation.	_____
Monthly	
Emergency lighting equipment shall be **tested** monthly to ensure that the emergency lighting will function upon failure of the primary power supply.	_____
Yearly	
Emergency lighting equipment shall be **tested** annually to ensure that the units will provide emergency lighting for a duration equal to the design criteria under simulated power failure conditions.	_____
After completion, the charging conditions for voltage and current and the recovery period will be **tested** annually to ensure that he charging system is in accordance with the manufacturer's specifications.	_____

7.2.7. Emergency Power Systems

General	**Responsibility**
Emergency power systems shall be **inspected**, **tested** and maintained in conformance with CAN/CSA C282-05, “Emergency Electrical Power Supply for Buildings”.	_____
To ensure continued reliable operation, the emergency power supply equipment shall be operated and maintained in accordance with manufacturer’s instructions.	_____
At least two copies of the instruction manual shall be maintained.	_____
Weekly	
Inspect test & maintain as per CAN/CSA C282-05, “Emergency Electrical Power Supply for Buildings”. Maintain Records.	_____
Monthly	
Inspect test & maintain as per CAN/CSA C282-05, “Emergency Electrical Power Supply for Buildings”. Maintain Records.	_____
Semi-Annually (Every 6 month)	
Inspect test & maintain as per CAN/CSA C282-05, “Emergency Electrical Power Supply for Buildings”. Maintain Records.	_____
Annually	
Inspect test & maintain as per CAN/CSA C282-05, “Emergency Electrical Power Supply for Buildings”. Maintain Records.	_____
Every 5 years	
Inspect test & maintain as per CAN/CSA C282-05, “Emergency Electrical Power Supply for Buildings”. Maintain Records.	_____

8. DRAWINGS

Property Site Plan



REV	DATE	REVISION DESCRIPTION	PROJ/AFE#	BY	CHK'D	APP'D
A	2020/05/12	ISSUED FOR APPLICATION	-	TL	NM	

REDONDA

LEGAL PROPERTY ADDRESS: E. 1/2 16-11-04 E.P.M.

SPRINGFIELD MANITOBA

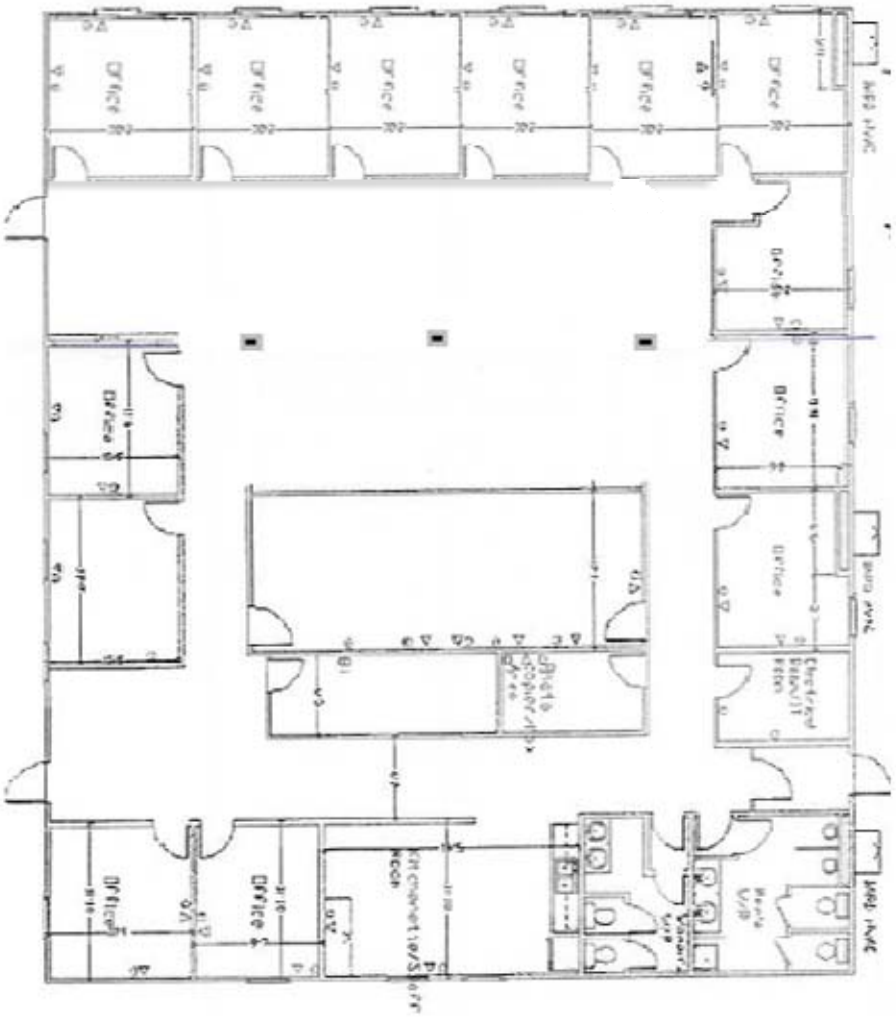
REDONDA FACILITY
SITE PLAN

SCALE 1:500

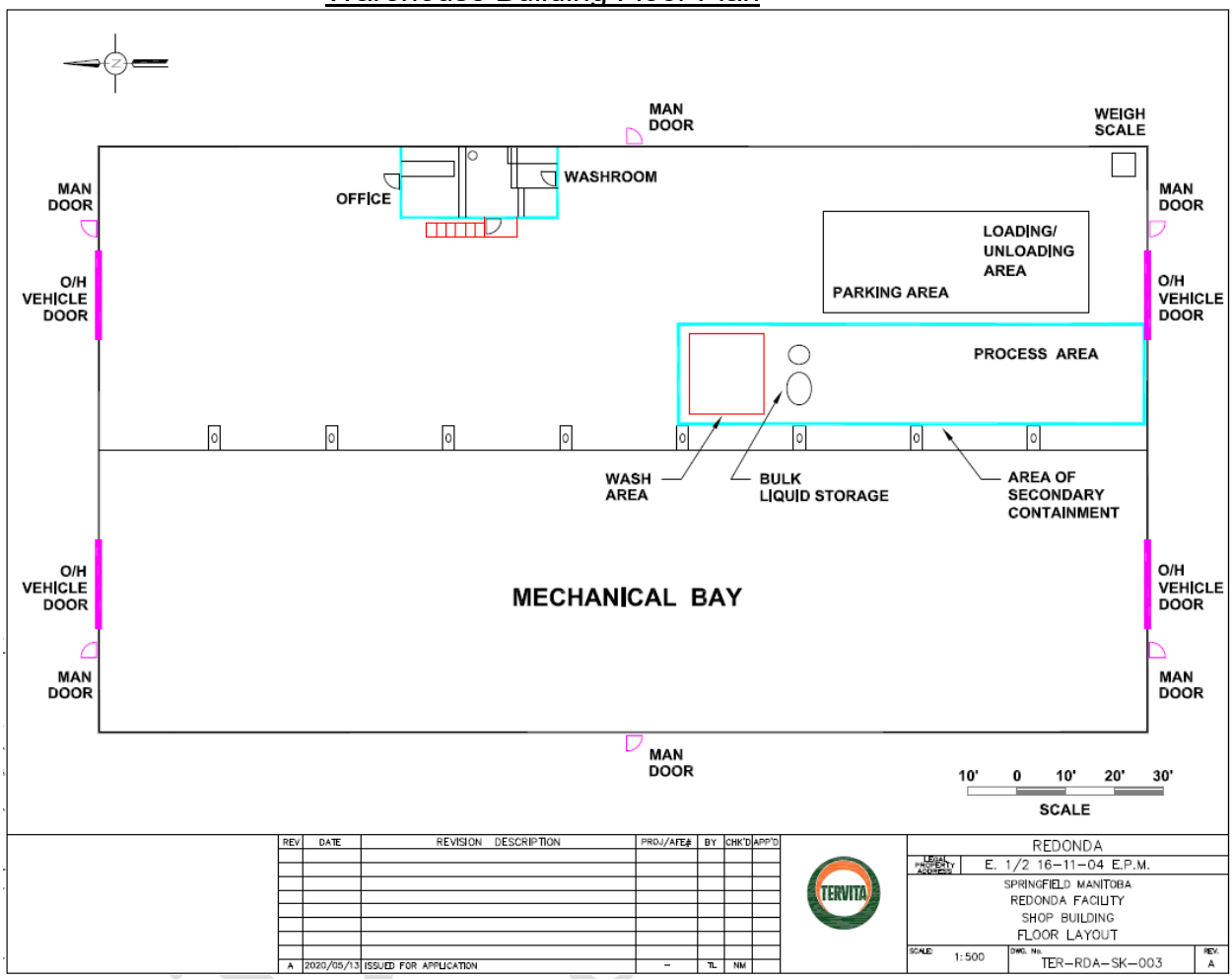
DWG No. TER-RDA-SK-002

REV. A

Administration Building Floor Plan



Warehouse Building Floor Plan



REV	DATE	REVISION DESCRIPTION	PROJ./AFE#	BY	CHK'D	APP'D
A	2020/05/13	ISSUED FOR APPLICATION	–	TL	NM	

TERVITA

REDONDA

LEGAL PROPERTY ADDRESS: E. 1/2 16-11-04 E.P.M.

SPRINGFIELD MANITOBA
REDONDA FACILITY
SHOP BUILDING
FLOOR LAYOUT

SCALE: 1:500 | DWG. No. TER-RDA-SK-003 | REV. A

9. RERENCE DOCUMENTS

CO-HSE-SUP-0900 Corporate ERP
CO-HSE-SUP-0901 Site Specific ERP
CO-HSE-SUP-0904 Emergency Drill Evaluation Form
CO-HSE-SUP-0914 Table Top Evaluation Form
CO-HSE-SUP-0764 Worksite Emergency Readiness Assurance Checklist
CO-HSE-STN-0714 Fire and Explosion Prevention
CO-HSE-SUP-0725 Fire Safety Inspection Checklist
CO-HSE-SUP-0926 Emergency Evacuation JSA
CO-HSE-SUP-0927 Emergency Evacuation Template JSA
CO-HSE-SUP-1005 Incident Statement