ARCADIS Design & Consultancy for natural and built assets

Public Services and Procurement Canada

on behalf of

Department of National Defence

LONG-TERM LANDFILL MONITORING AT THE PIN-3 FORMER DEW LINE SITE

Lady Franklin Point, Nunavut

27 March 2020

LONG-TERM LANDFILL MONITORING AT THE PIN-3 FORMER DEW LINE SITE

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BOC	natural biogenic organic compound
DCC	Defence Construction Canada
DEW	Distant Early Warning
DGPS	Differential Global Positioning System
DND	Department of National Defence
GPS	Global Positioning System
HDPE	High Density Polyethylene
LRR	Long Range Radar
masl	metres above sea level
mbgs	metres below ground surface
mtoc	metres below top of casing
MDL	Method Detection Limit
MW	Monitoring Well
NWS	North Warning System
PCB	Polychlorinated Biphenyl
PHC	Petroleum Hydrocarbon
PSPC	Public Services and Procurement Canada
QA/QC	Quality Assurance/Quality Control
RODI	Reverse Osmosis Deionized
RPD	Relative Percent Difference
SRR	Short-Range Radar
TOR	Terms of Reference
USAF	United States Air Force

EXECUTIVE SUMMARY

Public Services and Procurement Canada (PSPC) was engaged by Department of National Defence (DND) to procure environmental and geotechnical services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC contracted the services of Arcadis Canada Inc. (Arcadis) to perform the work and the management of the monitoring of DND DEW Line Sites (PIN-2, PIN-3, PIN-4, CAM-1, CAM-2, CAM-3, CAM-4, and CAM-M) in the Kitikmeot Region, Nunavut Settlement Area, for the years 2016 to 2020. This report documents the findings of the field program for the 2019 monitoring year conducted at the former DEW Line Site PIN-3, located at Lady Franklin Point, Nunavut.

The 2019 monitoring program took place between August 15 and 20, 2019 and included the inspection/monitoring of six landfills including the Main Landfill, NWS Landfill, South Landfill, North Landfill, Non-Hazardous Waste (NHW) Landfill, and Tier II Soil Disposal Facility.

The objective of the landfill monitoring program was to assess the performance of these landfills from an environmental and geotechnical perspective, which included visual inspection, soil sampling, groundwater sampling, and thermal monitoring (downloading data from thermistors installed in the Main Landfill and Tier II Soil Disposal Facility).

The main observations and required actions for future monitoring events at the PIN-3 site are shown below:

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
Main Landfill	Landfill performance is acceptable. There are no current geotechnical concerns. No environmental issues in soil were identified. An increasing trend in the concentration of arsenic, cobalt, copper, nickel and zinc in groundwater is visible in the downgradient analytical data for the Main landfill. However, these trends are not suspected to be an indication of contaminant migration from the landfill as the baseline mean exceedances that are primarily responsible for generating the trends are likely biased high due to the sample technique used when the samples were collected historically. Accordingly, no concerns were identified following a review of groundwater analyses results.	Continue environmental and geotechnical monitoring as per existing monitoring schedule.
NWS Landfill	Landfill performance is acceptable. There are no current geotechnical concerns. No environmental issues in soil were identified.	Continue environmental and geotechnical monitoring as per existing monitoring schedule.

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
South Landfill	Landfill performance is acceptable. There are no current geotechnical concerns. Concentrations of PHC F2 and arsenic in soil were detected above their specific 'baseline plus three standard deviations' values in 2019 at the landfill's upgradient and downgradient stations respectively. These results are not considered to be of concern at this time as the detected concentrations are similar to those reported in previous monitoring rounds. Trends should be re-assessed once data from more than 7 sampling events has been gathered.	Continue environmental and geotechnical monitoring as per existing monitoring schedule.
North Landfill	Landfill performance is acceptable. There are no current geotechnical concerns. Concentrations of copper in soil were detected above the 'baseline plus three standard deviations' value in 2019 at downgradient stations. These results are not considered to be of concern at this time as the detected concentrations are similar to those reported in previous monitoring rounds. Trends should be re-assessed once data from more than 7 sampling events has been gathered.	Continue environmental and geotechnical monitoring as per existing monitoring schedule.
Non-Hazardous Waste Landfill	Landfill performance is acceptable. There are no current geotechnical concerns. No environmental issues in soil were identified. No concerns were identified following a review of groundwater analyses results.	Continue environmental and geotechnical monitoring as per existing monitoring schedule.
Tier II Soil Disposal Facility	Landfill performance is acceptable. There are no current geotechnical concerns. No environmental issues in soil were identified. No concerns were identified following a review of groundwater analyses results.	Continue environmental and geotechnical monitoring as per existing monitoring schedule.

1 BACKGROUND

1.1 Context and Mandate

Public Services and Procurement Canada (PSPC) was engaged by Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC acquired the services of Arcadis Canada Inc. (Arcadis) to perform the work which included the management of the monitoring of DND DEW Line Sites (PIN-2, PIN-3, PIN-4, CAM-1, CAM-2, CAM-3, CAM-4 and CAM-M) in the Kitikmeot Region, Nunavut Settlement Area, for the years 2016 to 2020. This report documents the findings of the field program for the 2019 monitoring year conducted at the former DEW Line Site PIN-3, located at Lady Franklin Point, Nunavut.

Arcadis' 2019 monitoring field program took place between August 15 and 20, 2019 and entailed the inspection/monitoring of six landfills including the Main Landfill, NWS Landfill, South Landfill, North Landfill, Non-Hazardous Waste (NHW) Landfill, and Tier II Soil Disposal Facility.

The objective of this monitoring program was to assess the performance of these landfills from an environmental and geotechnical perspective. This included a visual inspection, soil sampling, groundwater sampling, and thermal monitoring (downloading data from thermistors installed in the Main Landfill and Tier II Soil Disposal Facility) in accordance with the Logistics and Work Plan prepared by Arcadis for the PIN-3 site.

1.1.1 Site Location

The DEW Line site at PIN-3, Lady Franklin Point, Nunavut, is located on the west side of Victoria Island at 68° 28' 30" north latitude and 113° 13' 50" west longitude. The community of Cambridge Bay is located approximately 325 kilometers southeast, and the community of Kugluktuk is located 115 kilometers to the southwest.

The site is under the care, custody and control of Raytheon Canada Limited (Raytheon). At the time of the 2019 field program some site facilities, including an aircraft hangar at the west end of the site's runway, were still present. However, all site facilities were locked and not accessible for use.

PIN-3 is accessible via charter aircraft or helicopter. In 2019, the runway was found to be in good condition.

1.1.2 Background

PIN-3 is a former auxiliary radar site of the DEW Line constructed in the 1950's. PIN-3 was converted to a Long-Range Radar (LRR) of the North Warning System (NWS) in the early 1990's. The environmental cleanup, and the demolition of DEW Line facilities not required for the operation of the LRR site, commenced in 2002 and was completed during the summer of 2004. The cleanup included the closure and remediation of existing landfills and collection of site debris as well as the construction of a landfill for the disposal of non-hazardous waste generated from demolition. A Tier II soil disposal facility was also constructed at this site for the disposal of Tier II contaminated soil.

1.1.3 Site Description and Site Features

The terrain in the area of PIN-3 is relatively flat with limited relief. Typical tundra topography including numerous, unconnected shallow depressions and thaw lakes in flat areas and adjacent ridges can be observed in the area. Vegetation growth is generally limited in exposed areas where the topography is flat, while some growth is present in the sheltered or leeward areas of the site.

The site is in a low-lying area generally no more than 16 metres above sea level. The landscape is mostly flat and characterized by coarse grained (i.e. varying cobble, gravels and sands) esker ridges. The site is situated within a zone of continuous permafrost.

Figure PIN-3.1 shows the overall site plan including airstrip, landfill locations, and access road.

1.2 Logistics and Work Plan

Prior to mobilization, Arcadis prepared a Logistics and Work Plan, dated 4 July 2019, which was submitted and accepted by DND. The Logistics and Work Plan was used as a reference to guide the 2019 environmental sampling and monitoring work completed at the PIN-3 DEW Line site. A copy of the Work Plan was taken with the Arcadis field staff for on-site reference purposes. The Work Plan also included a copy of the Nunavut Water Board water use license due to the use of an on-site camp at PIN-3.

1.3 Objective

The objective of the DEW Line landfill monitoring program is to collect sufficient information to assess the performance, integrity, and stability of the landfills from an environmental and geotechnical perspective for human health and environmental protection. Furthermore, an additional objective of the program is to collect information, in accordance with the monitoring requirements outlined below in Section 1.4, in a thorough and consistent manner during each monitoring event.

PSPC has specified the requirements for the Landfill Monitoring Program in the document entitled, *"Terms of Reference – DEW Line Landfill Monitoring Program – PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16",* dated November 2015. Specifically, Section 3 of the TOR outlined the project's objectives in detail. The monitoring schedule for PIN-3 is detailed in the following table.

Table 1-1 Monitoring Schedule – PIN-3 Lady Franklin Point

No. of Years After Construction	Monitoring Event No.	Year of Monitoring Event
1	1	2005
2	2	2006
3	3	2007
4	4	2008
5	5	2009
7	6	2011
10	7	2014
15*	8	2019
25	9	2029

* monitoring event covered under the current contract.

1.4 Scope of Work

The scope of work for the Long-Term Landfill Monitoring Program at PIN-3 was defined in the Logistics and Work Plan, dated 4 July 2019, as accepted by DND. The scope of work includes the activities summarized in the following table.

Table 1-2: PIN-3 Lady Franklin Point Scope of Work

Landfill	Type	Visual Inspection (Y/N)	Soil Sampling (# of locations and depths)	Groundwater Sampling (# of MWs)	Thermal Monitoring (# of Thermistors
Main Landfill	Leachate Contained	Y	4 x 2	4	4
NWS Landfill	Regraded	Y	4 x 2	none	none
South Landfill	Regraded	Y	7 x 2	none	none
North Landfill	Regraded	Y	5 x 2	none	none
Non-Hazardous Waste Landfill	NHWL	Y	4 x 2	4	none
Tier II Soil Disposal Facility	Tier II	Y	4 x 2	4	4
Total		**6**	**56**	**12**	**8**

Note: QA/QC duplicate samples were not included in totals listed above

1.5 Site Geology, Hydrogeology and Hydrology

The PIN-3 site is in a continuous permafrost zone with medium to high ground ice content. According to the map entitled, "Geology of Nunavut" by the Canada-Nunavut Geoscience Office, the bedrock geology is comprised Paleozoic Cambrian-Silurian carbonate and siliciclastic rocks. Based on field observations, the surficial geology at the PIN-3 site consisted of areas of exposed weathered bedrock or bedrock that is discontinuously overlain by coarse grained esker material (primarily of coarse sand to cobble deposits).

Groundwater flow is expected to be seasonal, occurring mainly in the summer period of maximum active layer permafrost thaw. Groundwater is located at shallow depths and is greatly influenced by local permafrost conditions. Surficial drainage at the site is localized to intermittent small ponded areas adjacent to the landfill features and varies between the respective landfill locations. Multiple small areas of standing surface water (ponding water) were observed immediately adjacent to the South Landfill during the 2019 field program.

1.6 Site Land-Use Description

The PIN-3 site is uninhabited; however, there are cabins along the shoreline to the north, west and south of Lady Franklin Point that are intermittently inhabited by residents of Kugluktuk and other communities in the area. The airstrip at the former PIN-3 site is also utilized occasionally by Canadian Armed Forces and Canadian Rangers for drills and operations within the region.

The PIN-3 site is known to be a habitat for Arctic Foxes, Arctic Loons, Canada Geese, Lesser Snow Geese, Ross's Geese, Muskoxen and Tundra Swans. Based on footprints observed by the wildlife monitors, a young polar bear had also been at the site in the 2019 season.

1.7 Field Program Staff

The 2019 PIN-3 DEW Line monitoring event was conducted by qualified Arcadis personnel with extensive experience in remote northern environments and at other DEW line monitoring sites in Nunavut. The following personnel were present on site:

Arcadis Canada Scientific Team and Roles

- Elliott Holden, B.Eng. – Environmental Field Staff Lead
- Ryan Janzen, P.Eng – Geotechnical Field Staff Lead

Inuit Support Team and Roles

- Denis Kavanna (camp staff)
- Colin Crockatt (wildlife monitor)
- Chad McCallum (wildlife monitor)
- Dwayne Allukpik (environmental assistant)
- Victor Koplomik (environmental assistant)
- Bradley Wingnek (environmental assistant)

1.8 Weather Conditions

Historical weather conditions for the PIN-3 site are presented in the following table. The historical weather conditions for the site are expressed as the 1981-2010 Climate Normals (temperature and precipitation totals) prepared by Environment Canada and Climate Change. The closest location for which Climate

Normal data exist is at Kugluktuk, NU, located approximately 115 km southwest of Lady Franklin Point, as presented below.

Table 1-3: Summary of Historical Temperature and Precipitation Conditions

Climate Normals (1981-2010)	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Daily Maximum Temp (°C)	-23.2	-23.4	-20.7	-11.4	-1.3	9.9	15.6	13.1	6.5	-3.5	-14.8	-20.3
Daily Average Temp. (°C)	-27.3	-27.7	-25.3	-16.3	-5.3	5.5	10.9	9.0	3.3	-6.6	-18.7	-24.5
Daily Minimum Temp. (°C)	-31.4	-32.0	-29.8	-21.2	-9.2	1.0	6.1	4.8	0.1	-9.8	-22.6	-28.6
Precipitation (mm)	10.4	8.4	9.9	10.0	14.6	16.6	44.5	45.1	37.8	26.5	13.0	10.4

An outline of the weather conditions encountered during the 2019 field work conducted by Arcadis is provided in Section 2.1.2. as well as on the individual Inspection Checklists for each inspected landfill.

1.8.1 Additional Work in 2019

The following additional work item was addressed as part of the 2019 work program, as requested by DND:

1. Collection of UTM co-ordinates of monitoring locations at PIN-3 (Additional Work Item 4.0 in the Logistics and Work Plan).

The UTM coordinates collected previously during earlier monitoring events executed on site (and provided as part of the reference material for the current monitoring program) were approximate. To rectify this, Arcadis staff obtained UTM coordinates for all monitoring locations during the 2019 work program using a Trimble R2 system (with horizontal accuracy falling within the 0.1 to 0.3 m range).

1.8.2 Deviations from the TOR, Proposal, Work Plan, and/or Kick-off Meeting

One minor groundwater sampling deviation occurred during the 2019 monitoring event. Monitoring well MW-09 was observed to be frozen and thus no sample was collected from this location.

Challenges were encountered collecting soil samples at the full depth as specified in the TOR (i.e., 40-50 cm) in 12 soil sampling locations (MW-6, MW-7, MW-14, MW-15, MW-16, P3-1, P3-4, P3-12, P3-13, P3-14, P3-15, and P3-16). Attempts were made using a pick-axe to advance the test pits to the required depth; however, bedrock was encountered, and the test pits met refusal at the depth noted in the field notes and on the soil sampling logs. Depth samples were collected from the bottom of the test pits at the maximum depth achievable.

Multiple issues occurred while attempting to download the .lsf files from the thermistors on site. These issues are detailed in Section 3.2.4 for the Main Landfill and Section 8.2.4 for the Tier II Soil Disposal Facility. The dataloggers at thermistors VT-3, VT-5 and VT-7 were non-responsive in the field, and after consultation with Lakewood Systems Ltd. (Lakewood), a complete memory transfer was carried out for

these loggers. Once the field team returned to Cambridge Bay, all raw data files were transferred to Lakewood to attempt data recovery. Lakewood was able to recover limited data in the form of .RAW files from VT-3 and VT-5, creating .lsf files from these, but no data was recoverable from VT-7.

1.9 Project References

Project references include:

A AECOM Canada Ltd. (January 2009). *The Collection of Landfill Monitoring Data at the PIN-3 Lady Franklin Point Site – 2008*. Project Number 107891 / 80297-3. Markham. ON.

B Arcadis Canada Inc. (March 8, 2016). *Proposal for Kitik 16 DEW Line Sites Monitoring, Response to Solicitation No. W6837-151003/B*. Ottawa, ON.

C Arcadis Canada Inc. (June 4, 2019). *Meeting Minutes, Kitikmeot DEW Line Sites Monitoring May 2019 Kickoff Meeting*. Ottawa, ON.

D Arcadis Canada Inc. (July 4, 2019). *Logistics and Work Plan, 2019 Kitik 16 DEW Line Site Monitoring, PIN-3, PIN-4, CAM-1, CAM-M sites*. Ottawa, ON.

E Biogénie, a division of Englobe Corp. (April 2015). *The Collection of Landfill Monitoring Data at the Former PIN-3 DEW Line Site, Lady Franklin Point, Nunavut, Revised Final Report – 2014* (O/Ref.: CD2656) (Y/Ref.: DLCLFMP2 (KITIK12), Quebec City, QC.

F Biogénie S.R.D.C. Inc. (January 2010). *The Collection of Landfill Monitoring Data at the Former PIN-3 DEW Line Site, Lady Franklin Point, Nunavut, Final Report – 2009 Season.* (O/Ref.: CD9229) (Y/Ref.: DLC MON (Kitik 09). Quebec City, QC.

G Canada-Nunavut Geoscience Office. (2006). *Geology of Nunavut.* Map. Iqaluit, NU.

H Department of Energy, Mines and Resources Canada. (1995). *Permafrost.* Map. Ottawa, ON.

I Gartner Lee Limited. (January 2018). *The Collection of Landfill Monitoring Data at the PIN-3 Lady Franklin Point Site.* Reference GLL 70-516. Markham. ON.

J IEG Nunasi Consultants Ltd. (January 13, 2012) *Kitik-07 – Report for the 2011 Collection of Landfill Monitoring Data at the PIN-3 Lady Franklin Point DEW Line Site, Nunavut*. File: A07001A02.730. Calgary AB.

K Indian and Northern Affairs Canada. (December 2008). *Abandoned Military Site Remediation Protocol*, Voulme I – Main Report. Northern Affairs Organization. Contaminated Sites Program

L Public Works & Government Services Canada. (November 2015). *Terms of Reference, DEW Line Landfill Monitoring Program – PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16*, (Specifically, Annex B and Annex S). Edmonton, AB.

1.10 Report Structure

This report describes the work completed in August 2019 at the following PIN-3 landfill locations:

- Main Landfill;
- NWS Landfill;
- South Landfill;
- North Landfill;
- Non-Hazardous Waste Landfill, and;
- Tier II Soil Disposal Facility.

This report has been organized such that the results for each landfill are presented within a separate section as outlined in the following table.

Table 1-4: Report Structure by Landfill at PIN-3

Landfill Identification	Section Number	Analytical Tables	Associated Figure Numbers
Main Landfill	3	Table 1 (Soil) Table 1A (Groundwater)	PIN-3.2A (Visual) PIN-3.2B (Historical Visual Features) PIN-3.2C (Soil) PIN-3.2D (Groundwater)
NWS Landfill	4	Table 2 (Soil)	PIN-3.3A (Visual) PIN-3.3B (Soil)
South Landfill	5	Table 3 (Soil)	PIN-3.4A (Visual) PIN-3.4B (Soil)
North Landfill	6	Table 4 (Soil)	PIN-3.5A (Visual) PIN-3.5B (Soil)
Non-Hazardous Waste Landfill	7	Table 5 (Soil) Table 5A (Groundwater)	PIN-3.6A (Visual) PIN-3.6B (Soil) PIN-3.6C (Groundwater)
Tier II Soil Disposal Facility	8	Table 6 (Soil) Table 6A (Groundwater)	PIN-3.7A (Visual) PIN-3.7B (Historical Visual Features) PIN-3.7C (Soil) PIN-3.7D (Groundwater)

Note: Analytical tables are provided at the rear of the report.

Results from soil sampling, groundwater sampling, and visual inspection of the respective landfills on site are presented in the format described in the TOR.

Each section details all the relevant information for the respective landfill areas included as part of the current 2019 Landfill Monitoring Program. Each of the individual landfill sections include:

- A brief description of the landfill;
- Completed Visual Inspection Checklist;
- A Preliminary Stability Assessment;
- A discussion of all the visual inspection issues assessed;
- The overall performance rating of the landfill;
- A photo log sheet (as **Appendix I** at the rear of this report);
- Annotated drawings of each landfill (figures follow each landfill section);
- Soil sampling logs and analytical data;
- Monitoring well sampling logs and analytical data (if applicable);
- A discussion and comparison of chemical data to background and previous years monitoring events;
- Graphed trends of chemical data (as **Appendix G** for soil and as **Appendix H** for groundwater at the rear of this report);
- Completed thermistor inspection forms (if applicable);
- Analysis of overall performance of the landfill; and
- Any recommendations for further action and conclusions.

The photographic record for all landfills is presented in **Appendix I**. The original photos are included in electronic format (.jpg) and are attached as a separate addendum CD/DVD-ROM to the report. An electronic version of the report and its component tables, figures and data files is included as a separate CD/DVD-ROM submittal to this report.

Certificates of Analysis, QA/QC analytical results and field notes are attached in the applicable appendices.

2 APPROACH AND METHODOLOGY

2.1 Summary of Work

2.1.1 Health and Safety

Before Arcadis' field team mobilized to the site, a site-specific health and safety plan (SSHASP) was submitted and accepted by DND. The plan outlined the general safety rules and procedures that were adhered to while working at the site. It also presented additional precautions and procedures in the event of an emergency. All project staff participating in the monitoring and assessment activities were required to familiarize themselves with the contents of the SSHASP and sign the Statement of Compliance document prior to commencing the field work.

Field crews carried appropriate emergency gear and took every precaution to keep the crew safe. This included the following, where appropriate:

- Obtaining maps to assist in identifying/characterizing the dominant physical features near the site (e.g., topographic maps and aerial photographs);
- Carrying and knowing how to use emergency communication devices such as satellite phones, which were tested for functionality and sufficient airtime prior to mobilization;
- Checking the weather prior to travel to the field;
- Compilation of a site-specific Emergency Contact List that included numbers for emergency services, office contacts, and individual emergency contacts;
- Carrying a Global Positioning System (GPS) unit for navigation as well as for relaying accurate location coordinates in case of emergency;
- Possession of a Level 1 First Aid kit appropriate to the scope of work and number of personnel;
- Possession of an Emergency Field kit containing provisions necessary to survive (e.g. food, tarps, flares) should transport, or rescue services, not be possible for a number of days; and
- Knowing how to use all emergency equipment and testing it prior to mobilization to the field.

The remote nature of the PIN-3 Lady Franklin Point site required that a comprehensive Emergency Field kit be mobilized to the site for the duration of the field work.

Arcadis staff received all relevant health and safety training in preparation for undertaking the work activities on-site prior to mobilization to the site. Arcadis ensured that all staff on site received a site safety orientation and field-specific training on contaminated sites, which was performed on Day 1 of the field program. The site safety orientation included specific details of the health and safety plan that were relevant for each job, and relevant training for each position.

2.1.2 Field Program

Arcadis staff mobilized to Cambridge Bay from Yellowknife on a commercial flight, then chartered a flight to the PIN-3 site via a Dornier 328 aircraft operated by Kingaunmiut Air. No ATV could be acquired before departing for the PIN-3 site; as a result, on-site operations were conducted on foot. Accommodations while in Cambridge Bay were provided by Inns North Arctic Islands Lodge (IFR0194). On-site accommodations were required for this contract in the form of a tent camp supplied by Kitnuna Corporation (IFR0378). The following table outlines the field schedule for PIN-3.

Table 2-1: 2019 Field Schedule for PIN-3 Lady Franklin Point

August 2019						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
11	12	13	14	15	16	17
	Mobilized to Yellowknife	Mobilized to Cambridge Bay	PIN-3 Logistics Other Work (i.e., CAM-M)	Other Work (i.e., CAM-M) Mobilized to PIN-3	Site Work at PIN-3	Site Work at PIN-3
18	19	20	21	22	23	24
Site Work at PIN-3	Site Work at PIN-3 Demobilized to Cambridge Bay	PIN-3 Sample Shipment PIN-4 Logistics	Mobilized to PIN-4			

Weather during the field inspection and monitoring event was a mix of sun, clouds, and rain with high winds. Temperatures ranged from 1 to 11 degrees Celsius.

2.1.3 Visual Inspection

Visual inspection of each landfill was conducted by Mr. Ryan Janzen, P.Eng. and based on the guidelines presented in Section 5.2 of the TOR. A visual inspection checklist (provided in Annex J1 of the TOR and reproduced herein for each individual landfill section) was completed for each landfill site inspected. Inspection information recorded for each landfill included its designation, type, date, monitoring event number, weather conditions, and the name of the inspector. Observations related to the following potential site conditions were recorded for each landfill:

- Settlement;
- Erosion;
- Lateral movement;
- Frost action;
- Sloughing;

- Cracking;
- Animal burrows;
- Vegetation establishment;
- Staining;
- Vegetation stress;
- Seepage points or ponded water;
- Debris or liner exposure;
- Condition of monitoring points; and
- Other relevant observations.

The presence of the above conditions was recorded on field notes as well as referenced with electronic DGPS coordinates for purposes of evaluating their location, dimensions, and extent. A DGPS survey of each landfill was performed (including elements such as the toe and crest, site features, above-listed geotechnical conditions, etc.), with the data later transcribed into AutoCAD to create the site figures.

Photographic records were taken to document the general condition of the landfill. Photographs were taken to substantiate recorded observations including where no concerns were identified. All photographs were referenced to existing monuments where possible and a 1 metre long survey rod (with 1 cm and 10 cm marked intervals) was used as an indication of scale in the visual inspection photographs. Red cones were also used to denote the shape and orientation of features (cones in the photographs are 20 cm in diameter). Photographs were taken using a Fuji XP130 or XP70 digital camera (Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 megapixels).

Historical features and conditions have been noted from previous monitoring events. Existing features were compared to these features noted in previous monitoring reports and a comparative analysis is included in each landfill section within this report. Features with a change in size of less than 0.5 m were deemed to be consistent with previous measurements as variation of this magnitude could potentially be caused by either a) rounding during historical measuring, which was performed manually, b) variation in the horizontal accuracy of the DGPS (typically less than 0.2 m, but ranging from 0.1 to 0.8 m on this site, or c) a combination of both.

All monitoring equipment was visually inspected (wells and thermistors) with any damages noted along with repair requirements. Photographic records of each monitoring station were also collected and are provided in Appendix I and on the DVD/CD-ROM provided separately.

2.1.3.1 Stability Assessment

Arcadis used the following Performance/Severity rating reference guide for purposes of assessing the geotechnical performance of the landfill sites inspected and the extent of any features noted.

Performance / Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion or settlement.

Performance / Severity Rating	Description
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement, • Liner exposed, and/or • Slope failure.
Extent	**Description**
Isolated	Singular feature.
Occasional	Features of note occurring at irregular intervals/locations.
Numerous	Many features of note impacting less than 50% of the surface area of the landfill.
Extensive	Impacting greater than 50% of the surface area of the landfill.

2.1.4 Soil Sampling

Soil sampling at each landfill site was completed concurrently with the other monitoring activities. A Soil Sampling Log (as was provided in Annex J2 of the TOR) was completed at each soil sampling location. Soil sampling logs for each monitoring station are provided in the individual landfill sections of this report.

Two samples were collected from each sampling location: one sample from 0-15 cm depth, and one sample from 40-50 cm depth wherever possible. Test pits were manually excavated with hand tools (pickaxe and stainless-steel shovel). All hand tools used for sample excavation were decontaminated between locations using Alconox and distilled water. Soil samples were placed in the laboratory supplied containers by hand. A clean pair of nitrile gloves was donned prior to the collection of each sample. The laboratory supplied containers used for each sample included one zip-top plastic bag, two 125 mL glass jars, and two 40 mL clear glass vials with methanol for preservation. All sample containers were pre-sterilized as supplied by Bureau Veritas Laboratories (BV Labs, formerly Maxxam Analytics).

All soil sampling locations were backfilled after the collection of soil samples. In addition, all locations were photographed during sampling and after backfilling was complete. A list of these photographs is included in **Appendix I** for each landfill.

Soil samples were collected at the locations as specified in Annex B of the TOR. The number of locations at each landfill is shown in the following table.

Table 2-2: Summary of Soil Sampling Locations at PIN-3

DEW Line Site	Landfill	Proposed # of Soil Sampling Locations	Actual # of Soil Sampling Locations	Total # of Samples Submitted for Analysis
PIN-3 Lady Franklin Point	Main Landfill	4 x 2	8	8
	NWS Landfill	4 x 2	8	8
	South Landfill	7 x 2	14	14
	North Landfill	5 x 2	10	10
	Non-Hazardous Waste Landfill	4 x 2	8	8
	Tier II Soil Disposal Facility	4 x 2	8	8
PIN-3 Total		**56**	**56**	**56***

*Total does not include duplicates.

Limited depth was achieved at multiple soil sampling stations as outlined in the following table.

Table 2-3: Summary of Soil Sample Depth Limitations at PIN-3

DEW Line Site	Landfill	Soil Sampling Station ID	Sampling Depth of Lower Sample (cm)	Reasoning for limitation
PIN-3 Lady Franklin Point	Main Landfill	MW-6	40-45	Refusal on bedrock
		MW-7	20-30	Refusal on bedrock
	NWS Landfill	P3-1	20-28	Refusal on bedrock
		P3-4	35-40	Refusal on bedrock
	Non-Hazardous Landfill	MW-14	20-30	Refusal on bedrock
		MW-15	30-40	Refusal on bedrock
		MW-16	15-25	Refusal on bedrock
	North Landfill –	P3-12	25-33	Refusal on bedrock
		P3-13	15-20	Refusal on bedrock
		P3-14	15-20	Refusal on bedrock
		P3-15	25-35	Refusal on bedrock
		P3-16	25-35	Refusal on bedrock

Soil samples were analyzed for the following parameters:

- Petroleum Hydrocarbons (PHCs) F1-F4 fractions;
- Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel and zinc; and,
- Polychlorinated Biphenyls (PCBs): Total Aroclors.

Soil analyses were carried out by Bureau Veritas Laboratories (BV Labs, formerly Maxxam Analytics). The analysis of PHC and inorganic soil parameters listed above were conducted at BV Labs' facility in Edmonton, Alberta, while the analysis of PCB soil parameters were conducted at BV Labs' facility in Calgary, Alberta. Both facilities are ISO 17025 certified.

Quality assurance and quality control (QA/QC) were to be carried out in accordance to the procedures outlined in Annex K of the TOR with alterations as specified by DND during the 2019 project kick off meeting (i.e., elimination of the inter-laboratory analysis requirements). QA/QC protocols were implemented for the soil sampling program. Blind duplicate samples and quality control and assurance measures were applied as appropriate. Blind duplicates were obtained at a frequency of 10% of the soil samples collected. As requested by DND, no samples for inter-laboratory analyses were collected as part of this monitoring program. The specific locations where blind duplicates were collected were determined in the field and noted in the field notes. In addition, one equipment blank was obtained by running laboratory supplied water over the stainless-steel shovel and then collecting it in laboratory supplied sample containers.

2.1.4.1 Soil Sample Analysis

During the site assessment stage of the DEW Line Clean-Up project, background concentrations of inorganic elements and PCBs in soil were determined using samples collected from areas not impacted by site activities. No PHC testing was conducted during the site assessment stage. As such, there are no background datasets available for PHCs. The background soil conditions can inform if there are naturally raised concentrations of inorganic elements present at the site that could be influencing the landfill monitoring results.

Baseline conditions refer to the soil and groundwater chemistry around the perimeters of the landfills during the site investigation and/or remediation stages of the DEW Line Clean-Up project, generally based on sampling results collected over a period of one to three years. These values are used to determine the conditions at each landfill around the time of remediation, and create a baseline mean that can be used for comparison to data collected over time, following completion of the remediation program.

Monitoring data can be considered within baseline conditions when it is within three standard deviations (SD) of the baseline mean, to account for natural variability in soil and groundwater conditions. For simplicity in this report, the term 'baseline plus three standard deviations' is represented by 'BL+3SD'. Furthermore, the term 'exceedance' will refer to a parameter concentration that exceeds the BL+3SD value.

For some parameters, there were insufficient detectable results during the investigation and remediation of the site (greater than 50% non-detects); consequently, the baseline mean was set to the detection limit and no standard deviation was calculated. In these cases, results are still compared to the BL+3SD; however, additional evaluation may be warranted to explain that the baseline results were below detection and a SD was not calculated, therefore a certain amount of natural variability (within three times the baseline mean) is expected.

Analytical results of soil samples collected downgradient of landfills are compared to those of samples collected upgradient of landfills. If concentrations upgradient of the landfill are similar to concentrations downgradient, it suggests that the landfill is performing as intended and any raised results are an indication of natural variability or natural conditions. Upgradient and downgradient results are also compared to the BL+3SD. Results above the BL+3SD could potentially indicate results outside of the natural variability in the area and should be further examined.

Trend evaluations are completed when there are more than seven monitoring events worth of data available for a landfill. Trend lines are provided on the graphs for each parameter for the upgradient locations combined (represented by a blue line on the graphs) and for all of the downgradient locations combined (represented by a black line on the graphs). The trend evaluation involves a visual review of the data points and associated trend lines. No statistical analysis is completed at this time. The visual review results in a conclusion of no apparent trend, a decreasing trend or an increasing trend.

The visual trend analysis for each parameter at upgradient and downgradient sampling locations should result in an observation that falls into one of three categories detailed below:

1. No apparent trend, or a decreasing trend for both upgradient and downgradient locations; these outcomes suggest that the landfill is performing as expected and there is likely no contaminant migration from the landfill.
2. An increasing trend upgradient and either a similar increasing trend downgradient, or no trend/a decreasing trend downgradient; these outcomes could indicate contaminant migration towards the landfill from an upgradient source, or it could represent contamination that was not remediated upgradient of the landfill during the site remediation phase.
3. A decreasing or no apparent trend upgradient, but an increasing trend downgradient could indicate potential contaminant migration from the landfill.

It should also be noted that the method detection limits in the TOR for the DEW Line sites for PHCs in soil are far lower than the typical laboratory MDLs reported. The low MDLs combined with the approach used to determine the comparison value created very low comparison reference values for PHCs (fractions F1 through F4). It should also be noted that the action level for petroleum hydrocarbon remediation at DEW Line sites is typically 2500 mg/kg; therefore, detectible hydrocarbon contamination below this concentration is not uncommon in the vicinity of the landfills.

Another factor considered in the evaluation of PHCs was the presence of natural organic peat. Such natural biogenic organic compounds (BOCs) can contain PHC F3 concentrations ranging from 150 mg/kg up to 1430 mg/kg along with PHC F4 concentrations varying from 150 mg/kg up to 1580 mg/kg. BOCs often have low (<30 mg/kg) PHC F2 concentrations and high PHC F3b (C22-C34) concentrations (i.e., PHC F3b range >85% of total PHC F3 range). Arcadis reviewed F2 and F3b concentrations in order to differentiate between a natural organic peat versus a refined petroleum product.

2.1.5 Groundwater Sampling

Groundwater sampling at each monitoring well installed around the Main Landfill, Non-Hazardous Waste Landfill, and the Tier II Soil Disposal Facility was completed concurrently with the other monitoring activities.

It should be noted that monitoring wells were not installed during the initial PIN-3 site assessment stage. As such, there are no background datasets available for groundwater. Analytical results of groundwater samples collected downgradient of landfills are compared to those of samples collected upgradient of landfills to assess for potential leachate migration.

A Monitoring Well Sampling Report (updated groundwater monitoring log provided by DND in 2018) was completed at each groundwater sampling location. These sampling reports note:

- Condition of the monitoring well;
- Any ponding water at the monitoring well location;
- Lock details;
- Monitoring well installation details;
- Water elevation(s);
- Depth to bottom of well;
- Height of well stick-up;
- Colour, odour, presence and thickness of free product if applicable;
- Purge volume and sampling equipment used; and
- pH, conductivity and in-situ temperature after each well volume purged and before sampling.

Monitoring wells were purged prior to sampling, with pH, conductivity, turbidity and temperature being measured continually during purging using the Horiba U-52 multi-parameter meter. These parameters were recorded every five minutes and groundwater sampling did not begin until the difference between measurements was <10% for all parameters. The purging and sampling of each monitoring well was completed using dedicated sampling equipment consisting of 6 mm diameter high density polyethylene (HDPE) tubing connected to a low flow peristaltic pump. Each well was purged and sampled using dedicated tubing supplies which were removed upon completion of the sampling to prevent damage due to freezing. Other sampling equipment, such as the interface probe and the Horiba U-52 multi-parameter meter, were decontaminated between monitoring events using Alconox and distilled water.

Groundwater samples were collected at the locations specified in Annex B of the TOR. The number of locations at each landfill is shown in the following table.

Table 2-4: Summary of Groundwater Sampling Locations at PIN-3

Monitoring Well ID	Observations	# of Groundwater Samples Collected
Main Landfill		
MW-5	Good Condition	1
MW-6	Good Condition	1
MW-7	Good Condition	1
MW-8	Good Condition	1
Tier II Disposal Facility		
MW-9	(1) Damaged hinge on casing but casing was still functional. (2) Frozen bentonite detected in the well.	None - Frozen
MW-10	Good Condition	1
MW-11	Good Condition	1

Monitoring Well ID	Observations	# of Groundwater Samples Collected
MW-12	Good Condition	1
Non-Hazardous Waste Landfill		
MW-13	Good Condition	1
MW-14	Good Condition	1
MW-15	Good Condition	1
MW-16	Good Condition	1

Groundwater samples were collected at eleven of the twelve monitoring well locations using the low-flow method. No sample was obtained from MW-9 as the groundwater was frozen.

Groundwater samples were analyzed for the following parameters:

- Inorganic elements – total concentrations: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc. (groundwater samples were not filtered or preserved, as per DND instructions); and
- Petroleum Hydrocarbons (PHCs): F1-F4 fractions.

Groundwater analyses was carried out by Bureau Veritas Laboratories of Edmonton, Alberta, an ISO 17025 certified laboratory.

Quality assurance and quality control (QA/QC) was to be carried out in accordance to the procedures outlined in Annex K of the TOR (with deviations as noted below) along with alterations, as specified by DND during the project kick off meeting (i.e., the elimination of the inter-laboratory analysis requirements). QA/QC protocols were implemented for the groundwater sampling program. Blind duplicate samples and quality control and assurance measures were applied as appropriate. However, blind duplicates were obtained at a frequency approximately 1% lower than the minimum target frequency of 10% of the groundwater samples collected, due to an incorrect interpretation of the QA/QC requirement.

As requested by DND, no samples for inter-laboratory analyses were collected as part of this monitoring program. The specific locations where blind duplicates were collected were determined in the field, as it was dependent on the amount of water available at each location. One trip blank, one field blank, and one equipment blank were also collected as part of the sampling program.

Arcadis conducted a chemical analysis review on the results of the groundwater samples collected and present these results in Section 3, Section 7 and Section 8 of this report. When discussing the analytical results and trends throughout the report the term ‘exceedance’ is used to describe a concentration for any given analyte that has reported concentrations above the baseline +3x standard deviations (BL+3SD).

2.1.6 Thermal Monitoring

Thermal monitoring at each landfill site, as applicable, was completed concurrently with the other monitoring requirements. At each thermistor installation location, an updated (2019) Thermistor Annual Maintenance Report form (provided by DND via email) was completed. Monitoring consisted of the following steps:

- Inspecting the condition of thermistor installations, noting their condition, damage if applicable, and any specific repair requirements. Batteries were replaced for all thermistors;
- Retrieving ground temperature data from the thermistor installations. A personal computer equipped with the appropriate software and datalogger programming files was used to retrieve the data;
- Collecting manual readings of thermistors using a digital multi-meter and switch box;
- Reprograming of the datalogger to take readings every 48 hrs commencing at noon;
- Resetting the datalogger memory to zero and restarting readings; and
- Monitoring the system using the personal computer to ensure that the dataloggers were functioning.

A total of eight thermistors were inspected and the memory of each thermistor datalogger was downloaded. Thermal monitoring data was retrieved from the thermistor installations as specified in the TOR. Three thermistor dataloggers (serial numbers 111108, 108066 and 111099) were brought south for repairs.

2.2 Field Notes and Data Collection

2.2.1 Field Notes

Field notes were collected using the field forms provided in the TOR, namely the Visual Inspection Checklist, Soil Sampling Log and Monitoring Well Sampling Log (TOR annexes J1, J2 and J3), as updated by DND in 2018. In addition, field notes regarding thermistor inspections were recorded on the field form provided as Annex M – Thermistor Inspection Template, with updates provided by DND in 2018. A copy of the field notes is provided in **Appendix E**.

2.2.2 Data Collection

The visual inspection was conducted with the aid of a Trimble R2 Differential Global Positioning System (DGPS) unit to locate features of note and to collect GIS information to be used in report preparation. The horizontal accuracy of the measurements taken with the DGPS unit ranged between 0.2 and 0.8 m, with most results falling within the 0.1 to 0.3 m accuracy range. DGPS data was tied into local site controls, including the twelve existing monitoring wells, eight existing thermistor installations and control monuments where found. A detailed data dictionary (Trimble file) was created prior to the site visit to capture all required information as outlined in the long-term monitoring plan. An SSF file and the data dictionary (Trimble files) are included on the appended CD/DVD ROM to be used in future site investigations.

Placement of features of note on the figures for each landfill was completed using the DGPS information, supplemented by visual observations and field measurements. During the previous monitoring event in 2014, placement of features of note on Figures was done through visual observations only. Given the use of the DGPS unit, the locations of features reported in this 2019 monitoring report are considered to be more accurate than those previously reported. Small differences in feature locations are, unless otherwise noted, a result of the use of the more accurate DGPS data.

Thermistor data was downloaded onto a personal computer from dedicated dataloggers on the site. Raw thermistor data is provided, as well as in Excel format on the appended CD/DVD ROM.

2.3 Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) was carried out in accordance with the procedures outlined in Annex K of the TOR with alterations as specified by DND during the project kick off meeting (i.e., the elimination of the inter-laboratory analysis requirements). QA/QC protocols were implemented for the soil and groundwater sampling programs. Blind duplicates were obtained for both soil and groundwater samples. One trip blank, one field blank, and one equipment blank were also collected as part of the groundwater sampling program.

Field personnel employed Arcadis' QA/QC protocols, including appropriate techniques for soil and groundwater sampling, sample storage, shipping and handling, as well as collection of duplicates.

2.3.1 Field

Soil samples collected for potential laboratory analysis were placed in polyethylene bags, laboratory prepared 125 mL glass jars fitted with screw-tight Teflon-lined lids, and 40 mL vials with methanol preservative (for PHC F1 analysis only). Groundwater samples were collected from monitoring wells and placed in a variety of appropriately sized and prepared laboratory supplied vessels. Sample numbers were clearly marked on the containers. The soil jars and water bottles were filled to capacity with zero headspace and stored in coolers with cold packs to moderate temperature fluctuations during transport to the laboratory. To prevent cross contamination field staff wore new nitrile gloves at each sample location.

The samples were transported to the project laboratory accompanied by a Chain of Custody form. Soil samples for PHC F1 were preserved in the field using methanol. No preservative is required for F2 to F4 fraction PHCs in soil. Groundwater samples for PHC F1 and PHC F2 to F4 were preserved with sodium bisulfate. No preservatives for groundwater were used in laboratory-supplied sampling containers (metals) and no field filtering was conducted by Arcadis, as specified in the TOR. Upon sample receipt, the laboratory added a preservative to the groundwater samples submitted for metals analyses, as is required under their standard protocols.

2.3.2 Laboratory

Field (i.e., blind) duplicate samples and quality control and assurance measures were applied as appropriate. The specific locations where blind duplicates were collected was determined in the field, as it was dependent on the amount of groundwater and/or soil available at each location. At the request of DND, no inter-laboratory analysis was completed as part of the 2019 monitoring.

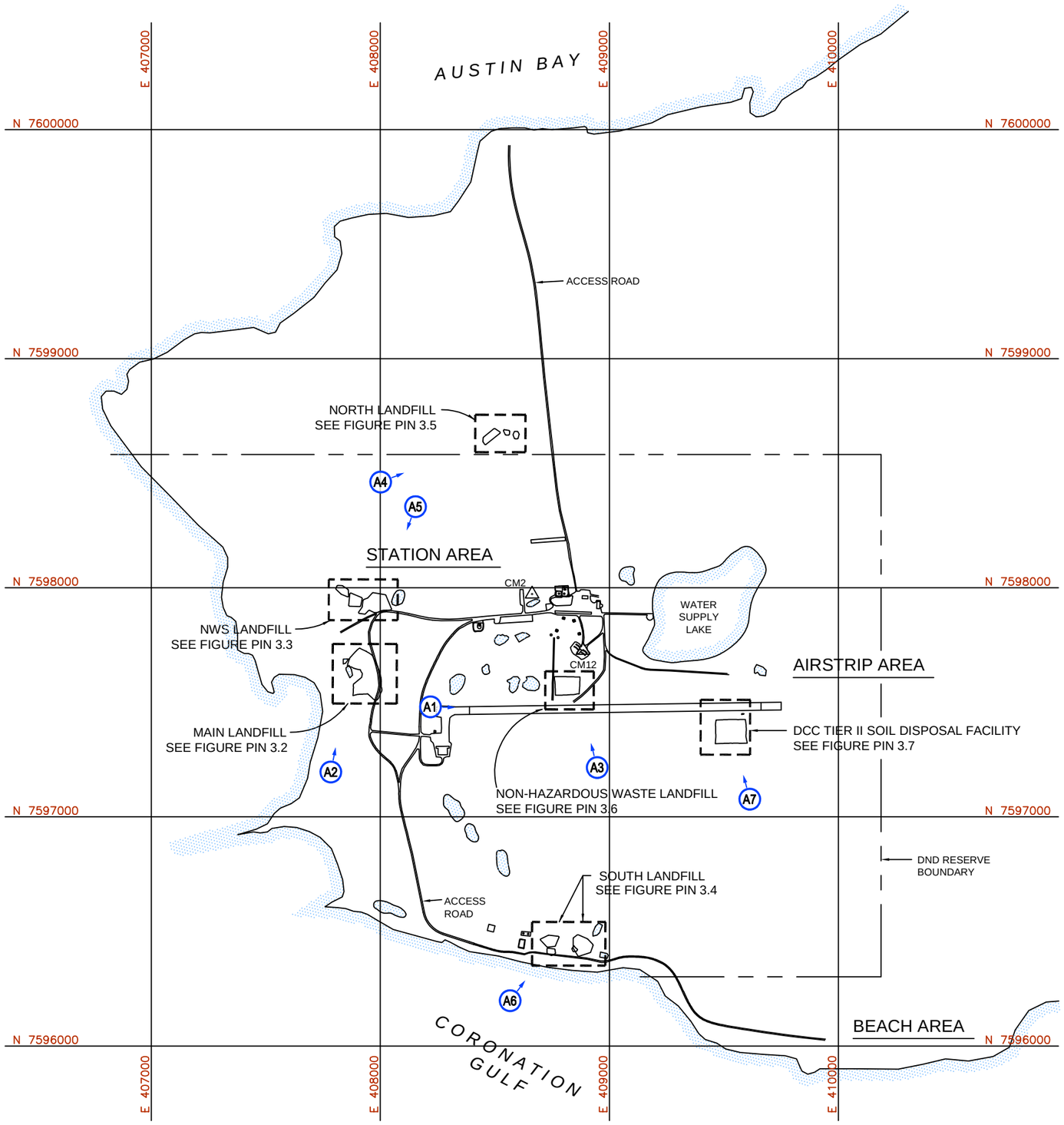
Travel blanks for groundwater were part of the sampling program. Laboratory prepared travel blanks were included in the sample bottle shipment and remained in the cooler with the collected groundwater samples throughout the duration of the project.

Field blanks for groundwater were collected by transferring laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), into the appropriate laboratory supplied sampling

containers. The field blanks were collected in the field at the same time as the groundwater sample collection.

Two sets of equipment blanks were collected. The first set was collected by running laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), over the stainless-steel shovel that was used to dig the test pits and allowing the water to drain into laboratory supplied sample containers. The second set was collected by pumping laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), through new tubing from the same batch that was used to sample the groundwater wells and into laboratory supplied sample containers.

A discussion and analysis of QA/QC results is presented in **Appendix F**.



LEGEND

- CM2 — SURVEY CONTROL MONUMENT
- WATERBODY
- AREA OF INTEREST
- ACCESS ROAD
- LANDFILL FOOTPRINT
- X — AERIAL PHOTOGRAPH LOCATION AND DIRECTION

Meters

400 0 400 800

1:20000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	TA	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

OVERALL SITE PLAN

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year)
Meter	1 : 20,000	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	T. AUSTRINS, P.ENG	C. GRAVELLE, P. ENG
PROJECT NO.	DRAWING NO.	PAGE
30000251	30000251-PIN-3.1	LS

FIGURE PIN-3.1

3 PIN-3: MAIN LANDFILL

3.1 Landfill Description

The Main Landfill is a leachate containment landfill located approximately 800 metres west of the main station facilities. The landfill is bounded on the west by an existing access road. The construction of this landfill included partial excavation with the installation of a liner system anchored into the permafrost along the toe of the landfill. The surface of the landfill was then regraded with the placement of additional granular fill of sufficient thickness to cause permafrost aggradation through the landfill contents.

The long-term monitoring plan for the Main Landfill consists of visual monitoring and collection of soil and groundwater samples, along with downloading of ground temperature data from thermistors located in the landfill and within the perimeter berms. The landfill layout, visual observations and photographic locations are presented on **Figure PIN-3.2A** located at the end of this section.

3.2 Summary of Work Conducted

3.2.1 Visual Inspection

A visual inspection was completed on the Main Landfill on 17 August 2019. The inspection was completed with no deviations from the visual inspection work plan.

3.2.2 Soil Sampling

Soil sampling at the Main Landfill was conducted on 17 August 2019 and included the collection of eight soil samples from four soil sample stations (MW-5, MW-6, MW-7, and MW-8). Depth limitations were encountered at soil sampling stations MW-6, where refusal on bedrock limited the depth sample from 0.4 to 0.45 metres below ground surface (mbgs), and at station MW-7, where refusal on bedrock limited the depth sample from 0.2 to 0.3 mbgs. The soil sampling activities conducted at the Main Landfill are detailed in the following table.

Table 3-1: Summary of Work Conducted by Soil Sampling Location – Main Landfill

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
MW-5 (upgradient)	MW-5A	0 - 0.15	Gravel and sand, few cobbles, trace organics, rootlets, greyish brown, dry
	MW-5B	0.4 – 0.5	Sand, some gravel, greyish brown, dry
MW-6 (downgradient)	MW-6A	0 - 0.15	Sand and organics, some gravel, rootlets, greyish brown, dry
	MW-6B	0.4 – 0.45	Sand, some gravel, trace cobbles, greyish brown, dry, refusal on bedrock
MW-7 (downgradient)	MW-7A	0 - 0.15	Sand and gravel, some cobbles, trace organics, rootlets, greyish brown, dry

	MW-7B	0.2 – 0.3	Sand and gravel, some cobbles, greyish brown, dry, refusal on bedrock
MW-8 (downgradient)	MW-8A	0 - 0.15	Sand and organics, trace gravel, rootlets, moist
	MW-8B	0.4 – 0.5	Sand, trace gavel, greyish brown, moist

3.2.3 Groundwater Sampling

Groundwater monitoring at the Main Landfill was conducted on August 17, 2019 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-5, MW-6, MW-7, and MW-8). Groundwater samples were collected from all four monitoring wells. The following table outlines the groundwater sampling activities conducted at the Main Landfill.

Table 3-2: Summary of Work Conducted by Monitoring Well - Main Landfill

Monitoring Well ID	Observations	Number of Groundwater Samples Collected
MW-5 (upgradient)	Good condition	1
MW-6 (downgradient)	Good condition	1
MW-7 (downgradient)	Good condition	1
MW-8 (downgradient)	Good condition	1

Monitoring well sampling logs are presented in **Appendix D**

3.2.4 Thermal Monitoring

Four thermistors (VT1, VT2, VT3, and VT4) are present at the Main Landfill. Each of the thermistor installations was inspected and the data on each datalogger was downloaded. All four thermistor dataloggers reinstalled at the site were reprogrammed to collect data every 48 hours at noon. The following table summarizes the 2019 thermal monitoring at the Main Landfill.

Table 3-3: Summary of 2019 Thermal Monitoring at Main Landfill

Thermistor ID	Observations/Notes
VT-1	Time on logger did not match local time.
VT-2	Time on logger did not match local time.
VT-3	An error was encountered when logger was connected to the field laptop. The cause of the error was suspected to be hardware related. Complete Memory Transfer was completed. Limited data could be recovered by Lakewood. The logger at VT-3 (serial number 111108) was replaced with a spare logger (serial number 02020270).
VT-4	Time on logger did not match local time.

It should be noted that the time on each datalogger was corrected (when necessary) to the local time prior to reinstallation. In addition, the datalogger in thermistor VT-3 (serial numbers 111108) was brought south for repair.

The manual resistance readings on the VT-3 datalogger for Beads 1 through 8 were normal in 2019 but the recovered data from the datalogger had many of the temperature readings missing from Beads 1 through 8. Based on this, we inferred that there was an issue with the datalogger rather than the beads themselves. The old VT-3 datalogger was switched out with a new unit in 2019. A check of the new VT-3 datalogger indicated it was working properly and that readings from Beads 1 through 8 appeared to be recording properly.

Updated (2019) thermistor inspection reports for each of the installations are located in **Appendix C**.

3.3 Results of the Monitoring Program

3.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR, and details are provided in Sections 3.3.1.1 through 3.3.1.5. **Figure PIN-3.2A** presents the visual inspection findings and photographic locations for the Main Landfill.

3.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR and the visual inspection checklist is included below.

Table 3-4: Visual Inspection Checklist - Main Landfill

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: Main Landfill LANDFILL TYPE: Containment DATE OF INSPECTION: 17 August 2019 WEATHER CONDITIONS: Mixed sun and cloud. Breezy, cool.
DATE OF PREVIOUS INSPECTION: 19 August 2014
INSPECTED BY: Ryan Janzen
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.**

Table 3-4: Visual Inspection Checklist – Main Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Y	A	Cap surface NW of VT-1.	7597727.579, 407942.709	12 North	844.7m^2		NA	~2%	Large, subtle depression.	Consistent.	Acceptable.	MLF_41 through 45, 49, 50
Settlement	Y	B	Cap surface immediately adjacent to VT-3; to the NE.	7597635.648, 407964.791	12 North	2.5	2.0	0.15	<1%	Subtle depression.	Slightly smaller than previously noted.	Acceptable.	MLF_75
Settlement	Y	G1 G2	N point at the toe of the slope.	7597794.496, 407930.293 7597791.919, 407933.654	12 North	4.5 1.2	1.0 0.5	0.05 0.10	<1%	Minor depression.	Consistent.	Acceptable.	MLF_13 through 15
Settlement	Y	H	W side, at crest.	7597703.920, 407935.648	12 North	3.5	1.5	0.05	<1%	Minor depression.	Slightly shorter but wider than previously noted.	Acceptable.	MLF_26
Settlement	Y	I1 I2	SW point, at the toe. SW point, at the crest.	7597599.143, 407889.222 7597608.820, 407895.621	12 North	4.0 2.0	4.0 0.5	0.15 0.1	<1%	Depression. Minor depression.	Consistent.	Acceptable.	MLF_35, 36 MLF_37
Settlement	Y	J1 J2 J3	S crest, roughly central.	7597609.767, 407907.522 7597608.295, 407925.961 7597613.119, 407948.366	12 North	2.0 5.5 4.5	1.0 2.2 1.6	0.05 0.1 0.1	<1%	Minor depression.	Larger than previously noted. NEW OBSERVATION. Larger than previously noted.	Acceptable.	MLF_63 MLF_64 MLF_65
Erosion	Y	K	E slope just below crest.	7597620.719, 407997.476	12 North	2.0	0.5	0.1	<1%	Subtle depression.	Larger than previously noted.	Acceptable.	MLF_81, 82
Erosion	Y	C1 C2 C3	S side elbow, from crest to toe.	7597605.493, 407950.438 7597606.255, 407952.075 7597604.530, 407952.882	12 North	13.0 13.0 12.5	0.15 0.2 0.15	0.1 0.1 0.1	<1%	Minor erosion at runoff funnel point.	Consistent.	Acceptable.	MLF_69, 70
Erosion	Y	D	S elbow on W side, at crest.	7597665.386, 407933.344	12 North	7.0	0.3	0.15	<1%	Minor erosion.	Longer than previously noted.	Acceptable.	MLF_52, 53
Erosion	Y	E	W side elbow, crest to toe.	7597689.528, 407935.938	12 North	19.5	0.3	0.05	<1%	Minor erosion.	Longer than previously noted.	Acceptable.	MLF_27 through 29
Erosion	Y	F	W side elbow, crest to toe	7597710.715, 407921.279	12 North	20.0	0.2	0.1	<1%	Minor erosion.	Longer than previously noted.	Acceptable.	MLF_23 through 25
Erosion	Y	L	NW slope, midpoint to toe.	7597756.427, 407875.631	12 North	5.5	0.2	0.05	<1%	Minor erosion.	Smaller than previously noted.	Acceptable.	MLF_18, 19
Erosion	Y	M	W slope, crest to midpoint.	7597634.537, 407894.725	12 North	9.75	0.1	0.05	<1%	Minor erosion.	Significantly longer than previously noted.	Acceptable.	MLF_57, 58
Erosion	Y	N	Not observed.	NA	12 North	NA	NA	NA	NA	Feature not observed.	Feature not observed.	Not observed.	MLF_80
Lateral Movement	N												
Frost Action	N												
Sloughing	N												
Cracking	N												
Animal Burrows	N												

Table 3-4: Visual Inspection Checklist – Main Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Vegetation Establishment	Y	P	Across entire structure.	Various	12 North	Total ~3100m^2	NA	~9%	Sparse vegetation.	Greater coverage than previously noted.	Acceptable.	MLF_10, 17, 21, 44, 72, 80, 84
Staining	N											
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	Y	VT-1	Thermistors on landfill embankment.	7597714.827, 407967.880	12 North					Monuments.	Consistent.	Good exterior condition.	MLF_41
		VT-2		7597735.430, 407878.842									MLF_48
		VT-3		7597635.837, 407963.756									MLF_74
		VT-4		7597625.020, 407899.561									MLF_59
		MW-5	Monitoring wells outside footprint.	7597694.058, 408046.301									MLF_1
		MW-6		7597730.892, 407854.866									MLF_2
		MW-7		7597686.437, 407914.471									MLF_3
		MW-8		7597608.772, 407870.688									MLF_4
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Y	O1	At crest in various locations across structure.	7597619.006, 407896.401	12 North	3.5	0.1	0.0	<1%	ATV ruts made as vehicles crest the slope of the structure.	Consistent.	Acceptable.	MLF_60
		O2		7597669.650, 407934.328		6.0	0.15	0.05	<1%		NEW OBSERVATION.		MLF_54a
		O3		7597671.435, 407935.504		5.0	0.15	0.15	<1%		NEW OBSERVATION.		MLF_54a
		O4		7597701.135, 407937.093		1.0	0.15	0.05	<1%		NEW OBSERVATION.		MLF_26
		O5		7597610.473, 407942.134		3.0	0.15	0.05	<1%		NEW OBSERVATION.		MLF_66

3.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Main Landfill was conducted on 17 August 2019 as per the TOR and the results are provided below.

Table 3-5: Preliminary Stability Assessment - Main Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Numerous
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable	Occasional
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

3.3.1.3 Photographic Records

The detailed photographic record for the Main Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the appended CD/DVD-ROM. **Figure PIN-3.2A** illustrates the photograph locations and viewpoint directions.

3.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Main Landfill. The following table outlines the results of the visual trend analysis. Features where no significant change was observed have not been listed here.

Table 3-6: Visual Inspection Trends - Main Landfill

Checklist Item	Feature ID	Comparison with Historical Observations
Settlement	B	Observed length has decreased from 3.0 m in 2014 to 2.5 m in 2019.
	J1	Observed length has increased from 0.9 m in 2014 to 2.0 m in 2019.
	J2	New observation.
	J3	Observed length has increased from 3.5 m in 2014 to 4.5 m in 2019.
	K	Observed length has increased from 0.5 m in 2014 to 2.0 m in 2019.
Erosion	D	Observed length has increased from 4.0 m in 2014 to 7.0 m in 2019.
	E	Observed length has increased from 11 m in 2014 to 19.5 m in 2019.
	F	Observed length has increased from 13 m in 2014 to 20 m in 2019.
	L	Observed length has decreased from 7.0 m in 2014 to 5.5 m in 2019.
	M	Observed length has increased from 2.0 m in 2014 to 9.75 m in 2019.
	N	Feature not observed in 2019.
Vegetation Establishment	P	Coverage appears to have expanded significantly since 2014 (no measurements given previously).
Other	O	Increase in frequency and severity since 2014 (no measurements given previously).

3.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2019 monitoring events at the Main Landfill indicates that previously observed settlement and erosion features generally increased in length or saw no significant change (of note is that the width and depths of features did not change significantly). The decrease in the observed length of Features B and L is attributed to erosive infill during meltwater events. One new settlement feature (J2) was observed, and Feature N, which was observed in 2014, was not observed in 2019. Of note are the tracks made by ATVs cresting the structure (O series features); five separate noteworthy features of this type were observed in 2019 versus one in 2014. The landfill structure is located directly between the hangar/airstrip and the Ranger camp on the shoreline, and the number of newly observed features indicates increased traffic over this route. None of these features as observed in 2019 are considered to pose a threat to the landfill integrity. Vegetated areas appear to be expanding; though there were no dimensions given from the 2014 program a comparison of observed areas against previous figures indicates larger areas in 2019. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

3.3.2 Soil Sampling

Soil sampling of the Main Landfill was conducted on 17 August 2019. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR. Details are provided below in the following sections.

3.3.2.1 Laboratory Analytical Results

A total of eight soil samples were collected from four soil sample locations at the Main Landfill and analyzed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 1** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chains of custody are presented in **Appendix B** of this report. **Figure PIN-3.2C** presents a summary of current and historical soil analytical results and is located at the end of this landfill section.

3.3.2.2 Summary of Soil Results

The soil results for 2019 are presented in the following table. The background and baseline mean are presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 3-7: Evaluation of Results by Parameter - Main Landfill

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Arsenic (As)	1.0	1.0	**1.0**	The soil sample from upgradient station MW-5 at depth exceeded the BL+3SD at 1.2 mg/kg but was within 3 times the baseline mean. All downgradient and remaining upgradient results were below the BL+3SD.
Cadmium (Cd)	1.0	1.0	**1.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Chromium (Cr)	20.0	20.0	**20.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	5.0	5.0	**5.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Copper (Cu)	12.6	12.0	**46.5**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Lead (Pb)	10.0	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Nickel (Ni)	6.7	5.0	**5.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Zinc (Zn)	16.4	15.0	**15.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
PCBs (Total)	0.10	0.10	**0.10**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F1 (C_6-C_{10})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F2 (C_{10}-C_{16})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F3 (C_{16}-C_{34})	N/A	15.7	**55.4**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F4 (C_{34}-C_{50})	N/A	50.0	**50.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

3.3.2.3 Summary of Soil Trends

Trends in parameter concentrations in soil, based on data from eight monitoring events that took place between 2005 and 2019, are presented in the following table.

Table 3-8: Discussion of Trends - Main Landfill

Parameter	Discussion of Trends
Arsenic (As)	Arsenic has a slight decreasing trend for upgradient samples and no apparent trend for downgradient samples.
Cadmium (Cd)	Cadmium appears to have a decreasing trend in both upgradient and downgradient samples. However, the majority of results are below detection and the apparent trends are likely a function of changes in the detection limits.
Chromium (Cr)	Chromium appears to have no apparent trend in upgradient and downgradient samples.
Cobalt (Co)	Cobalt appears to have no apparent trend in upgradient samples and a slight upward trend for downgradient results. However, the apparent upward trend is primarily due to the higher cobalt concentration detected in soil from MW-6 at depth in 2014. All historical soil results were less than the baseline mean.
Copper (Cu)	Copper appears to have no apparent trend in upgradient and downgradient samples.
Lead (Pb)	Lead has a slight decreasing trend for both the upgradient and downgradient samples, but the downgradient trend is decreasing at a less steep rate.
Nickel (Ni)	Nickel appears to have no apparent trend in upgradient and downgradient samples.
Zinc (Zn)	Zinc appears to have no apparent trend in upgradient and downgradient samples when outlier data is removed.
PCBs (Total)	PCBs appears to have an upward trend in both upgradient and downgradient samples. However, the majority of results are below detection and the apparent trends are primarily due to the higher detection limits reported for PCB results in 2011.
F1 (C_6-C_{10})	F1 appears to have a decreasing trend in both up and downgradient samples. However, all results are below detection and the apparent trends are likely a function of changes in the detection limits.
F2 (C_{10}-C_{16})	F2 appears to have no apparent trend for upgradient samples and a slight upward trend for downgradient samples. However, the majority of results are below detection and the apparent increasing trend is primarily due to the higher detection limits reported for PHC F2 results in 2014.
F3 (C_{16}-C_{34})	F3 appears to have a slight decreasing trend for upgradient samples and no apparent trend for downgradient samples.
F4 (C_{34}-C_{50})	7 years of data is not available; therefore, no trend line analysis was conducted

The trends discussed in the previous table are presented on a series of graphs for each parameter in **Appendix G1**.

3.3.2.4 Discussion of Soil Results and Trends

Upgradient soil results for the Main Landfill in 2019 were below the BL+3SD for all analytes with the exception of arsenic. The concentration of arsenic detected at depth at upgradient location MW-5 (1.2 mg/kg) was slightly above the BL+3SD (1.0 mg/kg). This arsenic result is not a new maximum for the

upgradient side of the Main Landfill. Concentrations of arsenic exceeding the BL+3SD have historically been detected at upgradient location MW-5 as high as 2.0 mg/kg. It should also be noted that all arsenic exceedances detected at upgradient location MW-5 have been within three times the baseline mean of 1.0 mg/kg which could represent natural variability given that the baseline mean for arsenic was set to the analytical detection limit at the time of the site investigations and no standard deviation was calculated.

All downgradient soil results at surface and depth were below the BL+3SD for all parameters at the Main Landfill in 2019. Furthermore, most downgradient concentrations detected were equivalent to upgradient concentrations, based on a visual comparison of the upgradient and downgradient data on the graphs in **Appendix G1**.

Over seven monitoring events worth of data are available for all parameters except PHC F4 at the Main Landfill and, as such, trends in parameter concentrations were evaluated. Only one parameter (cobalt) has exhibited an increasing downgradient trend, and no apparent upgradient trend, although all historical data were less than the baseline mean. As such, the landfill seems to be performing well and there is no indication of contaminant migration from the landfill at this time based on existing soil data.

3.3.3 Groundwater Sampling

3.3.3.1 Monitoring Well Sampling/Inspection Logs

As per Section 5.3.3.2 of the TOR, groundwater monitoring logs were filled out for each monitoring well. Monitoring well sampling logs are presented in **Appendix D**.

Stabilization of all field parameters was achieved prior to sampling for all monitoring wells except for well MW-7. Slow groundwater recharge was encountered at well MW-7 when sampling was first attempted on August 17th, 2019, and the well went dry before stabilization could be achieved. On August 18th, 2019, limited groundwater was detected in well MW-7 and it was estimated that purging three well volumes from the well before the scheduled departure date would not be possible. As such, only 1.3 well volumes were purged before the sample was collected from well MW-7. However, based on the field parameters collected and visual characteristics of the groundwater sampled, the analytical results for sample MW-7 are not suspected to have been appreciably impacted by this change to the prescribed sampling protocol.

3.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were measured and are presented in the table below.

Table 3-9: Summary of Groundwater Levels - Main Landfill

Monitoring Well ID	Monitoring Well Elevation (masl)	Water Level (mbtoc)	Well Stick up (m)	Water Level (mbgs)	Groundwater Elevation (masl)
MW-5	9.57	1.847	0.44	1.41	7.72
MW-6	4.07	1.653	0.57	1.09	2.42
MW-7	4.66	2.186	0.32	1.87	2.47
MW-8	3.08	1.202	0.56	0.65	1.88

Note: masl = metres above sea level, mbtoc = metre below top of casing, mbgs = metres below ground surface

Based on these 2019 findings, the highest groundwater elevation was measured at well MW-5 on the east side of the landfill. Groundwater contours are presented on **Figure PIN-3.2D** located at the end of this landfill section.

3.3.3.3 Groundwater Laboratory Analytical Results

A groundwater sample was collected from each of four monitoring wells at the Main Landfill and analysed for total inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc) and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 4A** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-3.2D** presents a summary of current and historical groundwater analytical results and is located at the end of this landfill section.

3.3.3.4 Summary of Groundwater Results

The groundwater results for 2019 are presented in the following table. The baseline mean is presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 3-10: Evaluation of Groundwater Analytical Results - Main Landfill

Parameter	Baseline Mean (mg/L)	Baseline Mean+3SD (mg/L)	Discussion of Results
Arsenic (As)	0.0030	**0.0030**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Cadmium (Cd)	0.0010	**0.0010**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Chromium (Cr)	0.0315	**0.1412**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	0.0030	**0.0030**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Copper (Cu)	0.0087	**0.0210**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Lead (Pb)	0.0100	**0.0100**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Nickel (Ni)	0.0204	**0.0681**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
Zinc (Zn)	0.0170	**0.0403**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
F1 (C_6-C_{10})	0.05	**0.05**	The downgradient sample from MW-6 exceeded the BL+3SD at 0.06 mg/L but was within 3 times the baseline mean. All upgradient and remaining downgradient results were below the BL+3SD.
F2 (C_{10}-C_{16})	0.5	**0.5**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.

Parameter	Baseline Mean (mg/L)	Baseline Mean+3SD (mg/L)	Discussion of Results
F3 (C_{16}-C_{34})	1.0	**1.0**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.
F4 (C_{34}-C_{50})	1.0	**1.0**	All groundwater sample results were below the BL+3SD at upgradient and downgradient locations.

3.3.3.5 Summary of Groundwater Trends

Trends in parameter concentrations in groundwater, based on data from eight monitoring events that took place between 2005 and 2019, are presented in the following table.

Table 3-11: Evaluation of Groundwater Chemistry Trends - Main Landfill

Parameter	Discussion of Trends
Arsenic (As)	Arsenic appears to have no apparent trend for upgradient samples and a slight upward trend for downgradient samples.
Cadmium (Cd)	Cadmium has a decreasing trend for both the upgradient and downgradient samples, but the downgradient trend is decreasing at a less steep rate.
Chromium (Cr)	Chromium appears to have no apparent trend for upgradient and downgradient samples.
Cobalt (Co)	Cobalt appears to have a decreasing trend for upgradient samples and a slight upward trend for downgradient samples.
Copper (Cu)	Copper appears to have a slight decreasing trend for upgradient samples and a slight upward trend for downgradient samples.
Lead (Pb)	Lead appear to have a decreasing trend for upgradient and downgradient samples.
Nickel (Ni)	Nickel has no apparent trend for upgradient samples and slight upward trend in downgradient samples.
Zinc (Zn)	Zinc appears to have no apparent trend for upgradient samples and a very slight upward trend for downgradient samples when outliers are removed.
F1 (C_6-C_{10})	F1 appears to have a very slight upward for upgradient and for downgradient samples. However, the majority of results are below detection and the apparent increasing trend is due to the higher detection limits reported for PHC F1 results in 2014.
F2 (C_{10}-C_{16})	7 years of data is not available; therefore, no trend line analysis was conducted
F3 (C_{16}-C_{34})	7 years of data is not available; therefore, no trend line analysis was conducted
F4 (C_{34}-C_{50})	7 years of data is not available; therefore, no trend line analysis was conducted

The trends discussed in the previous table are presented on a series of graphs for each parameter in **Appendix H1**.

3.3.3.6 Discussion of Groundwater Results and Trends

All upgradient results were below the BL+3SD for all groundwater parameters at the Main Landfill in 2019. Furthermore, most upgradient concentrations detected were comparable to downgradient concentrations, based on a visual comparison of the upgradient and downgradient data on the graphs in **Appendix H1**.

All downgradient concentrations of the selected groundwater analytes at the Main Landfill in 2019 were below the BL+3SD with the exception of the PHC F1 concentration detected in the sample from well MW-6. The concentration of PHC F1 detected in downgradient sample MW-6 (0.06 mg/L) was slightly above the BL+3SD (0.05 mg/L) but within three times the baseline mean (0.15 mg/L). This is worth noting because the baseline mean for PHC F1 was set to the analytical detection limit at the time of the site investigations and no standard deviation was calculated. It should also be noted that the majority of historical F1 results for groundwater at well MW-6 were reported at a laboratory detection limit that is above the BL+3SD.

Data from seven monitoring events are available for all groundwater parameters except PHC F2, F3 and F4 at the Main Landfill and, as such, trends in parameter concentrations were evaluated. Five of the nine parameters evaluated (arsenic, cobalt, copper, nickel and zinc) exhibited an increasing downgradient trend and no apparent or decreasing upgradient trend. It is worth noting that the 2019 results for each of these five parameters did not fit the increasing trendline and were all below BL+3SD. In addition, these increasing trends are primarily due to the baseline mean exceedances of the five parameters detected in 2009 and 2014. This is worth noting as the groundwater samples in 2009 and 2014 were collected using inertial lift pumps and not the low-flow techniques used in 2011 and 2019. Inertial lift pumps tend to suspend sediment in the groundwater which in turn can cause higher detections of analytes. This fact is supported by the elevated turbidity readings of the groundwater samples collected in 2009 and 2014. The groundwater results obtained in 2011 and 2019 using low-flow sampling techniques which limits sediment suspension yielded lower detections of the same analytes. Accordingly, the increasing downgradient trends of arsenic, cobalt, copper, nickel and zinc are not suspected to be an indication of contaminant migration from the landfill.

3.3.4 Thermal Monitoring

3.3.4.1 Thermistor Annual Maintenance Reports

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for thermistors as provided in **Appendix C**.

3.3.4.2 Summary of Findings from Annual DEW Line Thermal Reports

Raw thermistor data from our 2019 monitoring session was sent to DND for reference and review as part of the PIN-3 draft Field Progress report. No analyzed thermistor data was provided to Arcadis for inclusion into the 2019 monitoring report.

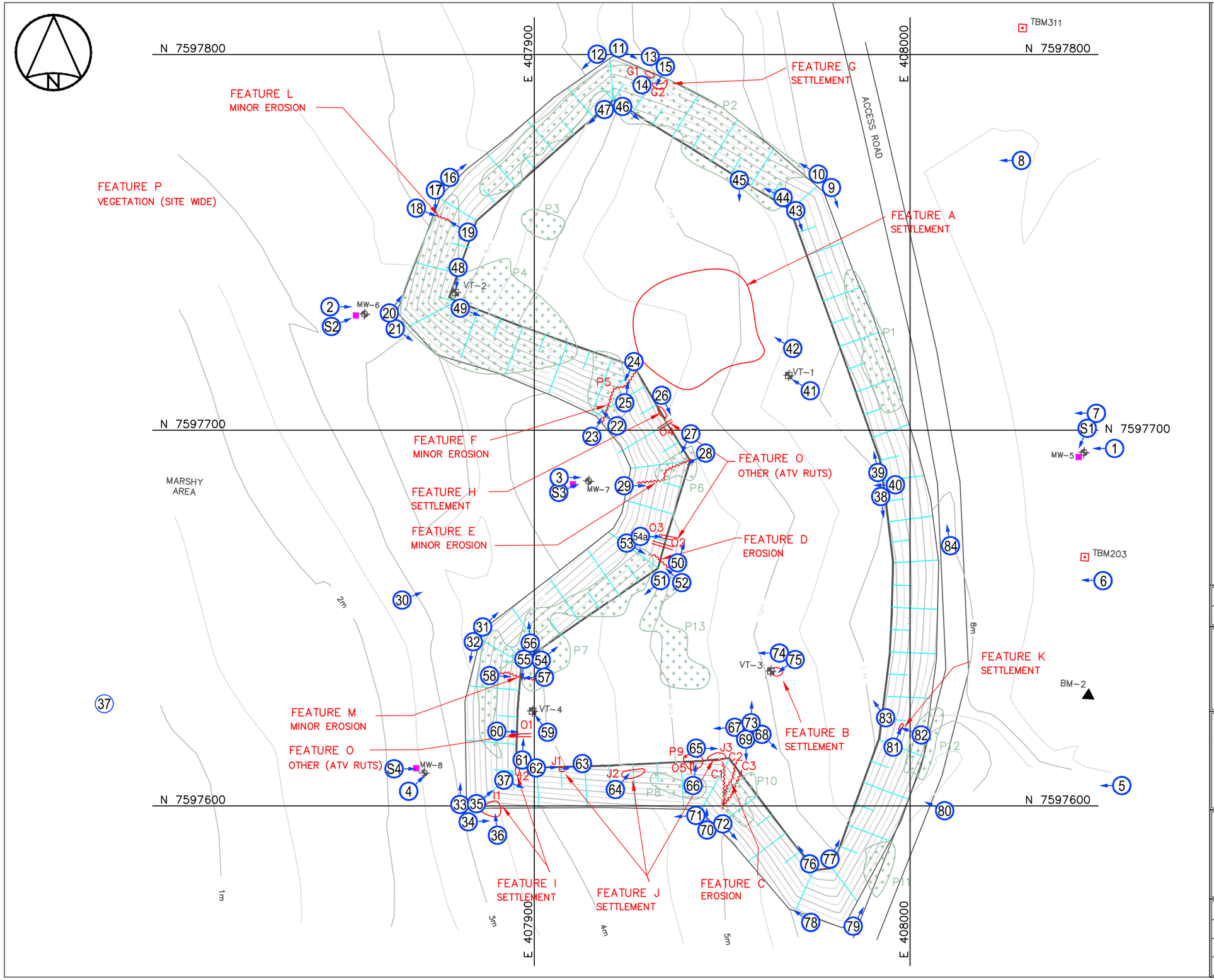
3.4 Overall Landfill Performance, Conclusions and Recommendations

Based on a review and analysis of the 2019 soil and groundwater data, the landfill appears to be performing as intended with no apparent indications of contaminant migration at this time.

It is recommended that the long-term monitoring of soil and groundwater continue as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

Based on the results of the 2019 monitoring program, the overall performance of the Main Landfill is acceptable.



LEGEND

- TBM203 — TEMPORARY BENCHMARK
- BM-2 — PERMANENT BENCHMARK
- MW-5 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SAMPLE LOCATION
- SETTLEMENT
- EROSION
- OTHER (ATV RUTS)
- SPARSE VEGETATION
- X — APPROX. PHOTOGRAPHIC VIEWPOINT (2019)

Meters

20 0 20 40

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NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	TA	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING MAIN LANDFILL
2019 VISUAL INSPECTION

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	R. JANZEN	C. GRAVELLE, P.ENG
PROJECT NO.:	DRAWING NO.:	PAGE:
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FIGURE PIN-3.2A

N 7597800

N 7597700

N 7597600

E 407900

E 408000

TBM311

TBM203

BM-2

MW-5

MW-6

MW-7

MW-8

VT-1

VT-2

VT-3

VT-4

ACCESS ROAD

MARSHY AREA

FEATURE G
2 x SETTLEMENT

FEATURE G
SETTLEMENT

FEATURE L
MINOR EROSION

FEATURE P
VEGETATION (SITE WIDE)

FEATURE L
EROSION

FEATURE A
SETTLEMENT

FEATURE A
SETTLEMENT

FEATURE F
EROSION

FEATURE H
SETTLEMENT

FEATURE F
MINOR EROSION

FEATURE H
SETTLEMENT

FEATURE O
OTHER (ATV RUTS)

FEATURE E
MINOR EROSION

FEATURE E
EROSION

FEATURE D
EROSION

FEATURE D
EROSION

FEATURE B
SETTLEMENT

FEATURE B
SETTLEMENT

FEATURE K
SETTLEMENT

FEATURE K
SETTLEMENT

FEATURE M
EROSION

FEATURE M
MINOR EROSION

FEATURE O
ATV TRACKS

FEATURE O
OTHER (ATV RUTS)

FEATURE J
2 x SETTLEMENT

FEATURE C
3 x EROSION

FEATURE I
SETTLEMENT

FEATURE N
EROSION

FEATURE I
SETTLEMENT

FEATURE J
SETTLEMENT

FEATURE C
EROSION

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13

G1 G2 O1 O2 O3 O4 O5 J1 J2 C1 C2 C3 J3

2m 1m 3m 4m 5m 8m

LEGEND

- TBM203 — TEMPORARY BENCHMARK
- BM-2 — PERMANENT BENCHMARK
- MW-5 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SAMPLE LOCATION
- SETTLEMENT
- EROSION
- OTHER (ATV RUTS)
- SPARSE VEGETATION
- 2014 VISUAL INSPECTION OBSERVATIONS (FOR REFERENCE)

NOTE:
RED = 2019 FEATURES
PURPLE = 2014 FEATURES

Meters
20 0 20 40
1:1000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	TA	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING MAIN LANDFILL
2019 & 2014 VISUAL INSPECTION

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	R. JANZEN	C. GRAVELLE, P.ENG
PROJECT NO.:	DRAWING NO.:	PAGE:
30000251	30000251-PIN-3.2	PL

FIGURE PIN-3.2B



Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
MW-6 surface - downgradient																		
05-26648	MW-6	2005	1	Phase I	0	<1	<1	<20	<5	**12.0**	<10	<5	<15	<0.003	<10	5	14	<8
05-26649 (Dup)	MW-6	2005	1	Phase I	0	**1.8**	<1	<20	<5	8.8	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-3	MW-6	2006	2	Phase I	10	0.795	<0.5	5.6	2.1	7.5	<2	<5	7.4	<0.01	<10	<5	**18**	6
TP-17 (Dup)	MW-6	2006	2	Phase I	10	0.705	<0.5	4.1	2.1	4.1	<2	<5	6.7	<0.01	<10	<5	<5	<5
P3-MW-6-1	MW-6	2007	3	Phase I	10	0.949	<0.5	6.2	2.4	**12.0**	<30	**6.0**	8.0	<0.01	<10	N/A	**170**	48
P3-MW-6A	MW-6	2008	4	Phase I	10	<5	<0.5	5.2	2.3	6.2	<2	<5	5.4	<0.05	<10	<30	<50	N/A
P309-6WA	MW-6	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	5.0	<1	3.0	<10	<0.01	<12	<10	**25**	11
S511-022	MW-6	2011	7	Phase II	0-15	<2	<0.1	**21.7**	2.6	6.5	<5	**13.8**	13.8	<0.45	<5	N/A	N/A	N/A
S511-023 (Interlab	MW-6	2011	7	Phase II	0-15	<1	<0.1	6.0	2.0	6.0	1.0	**6.0**	<10	<0.01	<12	<10	<10	<10
P314-6WA	MW-6	2014	10	Phase II	0-15	0.9	0.02	6.0	3.3	**14.1**	<5	**6.1**	8.0	<0.10	<10	<50	<50	<100
MW-6A	MW-6	2019	15	Phase II	0-15	<1.0	<0.050	4.5	2.1	8.4	1.4	4.2	6.7	<0.010	<3.5	<3.0	**17**	<4.7
MW-6 depth - downgradient																		
05-26650	MW-6	2005	1	Phase I	30	**1.1**	<1	<20	<5	6.6	<10	<5	<15	<0.003	<10	5	<9	<8
TP-4	MW-6	2006	2	Phase I	50	0.983	<0.5	5.3	2.6	11.1	<2	**5.4**	8.6	<0.018	<10	9	**19**	<5
TP-18 (Dup)	MW-6	2006	2	Phase I	50	0.881	<0.5	4.9	2.5	10.8	<2	<5	7.9	<0.01	<10	5	**18**	23
P3-MW-6-2	MW-6	2007	3	Phase I	50	**3.15**	0.55	5.4	3.2	**19.2**	<30	**8.0**	9.3	<0.01	<10	<5	15	12
P3-MW-6B	MW-6	2008	4	Phase I	50	<5	<0.5	7.8	3.8	10.0	<2	**6.3**	7.9	<0.05	<10	<30	<50	N/A
P309-6WB	MW-6	2009	5	Phase I	40-50	<1	<0.1	3.0	2.0	7.0	<1	3.0	<10	<0.01	<12	<10	**18**	<10
P309-8D2 (Dup)	MW-6	2009	5	Phase I	40-50	**2.0**	<0.1	3.0	2.0	9.0	1.0	4.0	<10	<0.01	<12	<10	11	<10
S511-024	MW-6	2011	7	Phase II	40-50	<2	<0.1	**43.4**	3.3	6.0	<5	**23.8**	14.1	<0.45	<5	N/A	N/A	N/A
P314-6WB	MW-6	2014	10	Phase II	40-50	0.8	<0.01	4.0	3.2	**14.2**	<5	4.6	6.0	<0.10	<10	<50	<50	<100
P314-8D1 (Dup)	MW-6	2014	10	Phase II	40-50	0.9	0.01	4.6	2.7	8.6	<4.9	4.0	7.0	<0.10	<10	<50	<50	<100
P314-6WB (Interla	MW-6	2014	10	Phase II	40-50	**5.9**	0.26	**21.0**	**6.3**	**15.0**	**37.0**	**27.0**	**130.0**	<0.01	<12	<10	<50	N/A
MW-6B	MW-6	2019	15	Phase II	40-45	<1.0	<0.050	4.6	2.0	11	1.2	3.9	6.3	<0.010	<3.5	<3.0	9.1	<4.7

PIN-3 Main Landfill	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
Background Data - Arithmetic Mean	1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**1.0**	**1.0**	**20.0**	**5.0**	**12.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**15.7**	**50.0**
Baseline Data - Standard Deviation	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.00	0.0	0.0	13.2	0.0
Baseline Data Mean + 3x Standard Deviation	**1.0**	**1.0**	**20.0**	**5.0**	**46.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**55.4**	**50.0**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
MW-5 surface - upgradient																		
05-26652	MW-5	2005	1	Phase I	0	**2.0**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6.8	**18**	11
TP-1	MW-5	2006	2	Phase I	10	**1.06**	<0.5	5.7	2.4	10.9	3.8	<5	8.1	<0.01	<10	<5	<5	<5
P3-MW-5-1	MW-5	2007	3	Phase I	10	0.508	<0.5	3.9	<2	11.8	<30	<5	5.8	<0.01	<10	**26**	**180**	**180**
P3-17-1 (Dup)	MW-5	2007	3	Phase I	10	**1.53**	<0.5	5.8	3.1	6.7	<30	<5	9.6	<0.05	<10	<5	9	26
P3-17-1 (Interlab)	MW-5	2007	3	Phase I	10	<10	<0.5	5.0	3.0	4.0	<5	4.0	8.0	<0.03	<5	<80	<250	N/A
P3-MW-5A	MW-5	2008	4	Phase I	10	<5	<0.5	6.0	3.0	7.0	3.8	<5	5.8	<0.05	<10	<30	<50	N/A
P309-5WA	MW-5	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	<5	1.0	2.0	<10	<0.01	<12	10	**22**	<10
S511-031	MW-5	2011	7	Phase II	0-15	<2	<0.1	16.9	3.6	7.8	<5	**12.0**	**15.3**	<0.45	<5	N/A	N/A	N/A
P314-5WA	MW-5	2014	10	Phase II	0-15	**1.4**	0.01	4.7	2.4	4.8	<5	3.0	8.0	<0.10	<10	<50	<50	<100
MW-5A	MW-5	2019	15	Phase II	0-15	<1.0	<0.050	4.9	2.0	6.2	1.9	3.4	6.9	<0.010	<3.5	<3.0	12	<4.7
MW-5 depth - upgradient																		
05-26654	MW-5	2005	1	Phase I	30	**1.4**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6	<9	<8
TP-2	MW-5	2006	2	Phase I	50	0.955	<0.5	3.4	<2	3.8	<2	<5	6.9	<0.01	<10	<5	<5	<5
P3-MW-5-2	MW-5	2007	3	Phase I	50	0.841	<0.5	4.8	2.7	**16.8**	<30	<5	7.9	<0.05	<10	<5	**22**	17
P3-MW-5B	MW-5	2008	4	Phase I	50	<5	<0.5	5.4	2.2	4.7	2.5	N/A	5.9	<0.05	<10	<30	<50	N/A
P309-5WB	MW-5	2009	5	Phase I	40-50	<1	<0.1	2.0	<1	<5	1.0	2.0	<10	<0.01	<12	<10	14	<10
S511-032	MW-5	2011	7	Phase II	40-50	<2	<0.1	18.6	2.3	6.9	<5	**11.3**	14.0	<0.45	<5	N/A	N/A	N/A
P314-5WB	MW-5	2014	10	Phase II	40-50	0.9	<0.01	6.3	2.1	3.9	<5	3.3	6.0	<0.10	<10	<50	<50	<100
MW-5B	MW-5	2019	15	Phase II	40-50	**1.2**	<0.050	4.5	1.6	5.7	1.5	2.8	5.7	<0.010	<3.5	<3.0	13	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
MW-7 surface - downgradient																		
05-26644	MW-7	2005	1	Phase I	0	<1	<1	<20	<5	7.5	<10	<5	<15	<0.003	<10	<4	<9	<8
05-26645 (Dup)	MW-7	2005	1	Phase I	0	<1	<1	<20	<5	8.5	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-5	MW-7	2006	2	Phase I	10	**1.3**	<0.5	6.1	2.9	10.2	2.5	<5	10.0	<0.01	<10	<5	8	<5
P3-MW-7-1	MW-7	2007	3	Phase I	10	**1.31**	<0.5	6.8	2.6	11.5	<30	<5	9.5	<0.01	<10	<5	**24**	17
P3-MW-7A	MW-7	2008	4	Phase I	10	<5	<0.5	5.1	2.1	10.3	2.1	<5	5.3	<0.05	<10	<30	<50	N/A
P3-MW-7B (Dup)	MW-7	2008	4	Phase I	15	<5	<0.5	6.8	2.5	**12.1**	2.5	<5	7.5	<0.05	<10	<30	<50	N/A
P309-7WA	MW-7	2009	5	Phase I	0-15	<1	<0.1	4.0	2.0	5.0	1.0	4.0	<10	<0.01	<12	<10	15	<10
S511-025	MW-7	2011	7	Phase II	0-15	<2	<0.1	18.5	3.4	10.4	<5	**13.4**	**17.5**	<0.45	<5	N/A	N/A	N/A
P314-7WA	MW-7	2014	10	Phase II	0-15	**2.0**	<0.01	4.5	2.0	7.2	<5	3.4	8.0	<0.10	<10	<50	<50	<100
MW-7A	MW-7	2019	15	Phase II	0-15	<1.0	<0.050	5.2	2.4	9.6	1.8	4.6	8.7	<0.010	<3.5	<3.0	12	<4.7
MW-7 depth - downgradient																		
05-26646	MW-7	2005	1	Phase I	30	<1	<1	<20	<5	8.6	<10	<5	<15	<0.003	<10	4	13	<8
05-26647 (Dup)	MW-7	2005	1	Phase I	30	<1	<1	<20	<5	7.0	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-6	MW-7	2006	2	Phase I	30	**1.7**	<0.5	4.5	2.3	8.6	2.6	<5	8.1	<0.01	<10	<5	<5	<5
P3-MW-7-2	MW-7	2007	3	Phase I	40	**1.15**	<0.5	4.3	<2	8.0	<30	<5	8.1	<0.01	<10	<5	**31**	<5
Not sampled - refu	MW-7	2008	4	Phase I	40-50													
P309-7WB	MW-7	2009	5	Phase I	25-35	<1	<0.1	3.0	2.0	6.0	1.0	3.0	<10	<0.01	<12	**13**	**24**	<10
S11-026	MW-7	2011	7	Phase II	40-50	<2	0.1	**87.9**	3.7	**12.0**	<5	**44.9**	**20.3**	<0.45	<5	N/A	N/A	N/A
P314-7WB	MW-7	2014	10	Phase II	40-50	**1.1**	0.01	4.3	2.3	7.3	<4.9	3.7	7.0	<0.10	<10	<50	<50	<100
MW-7B	MW-7	2019	15	Phase II	20-30	<1.0	<0.050	5.1	2.0	**12**	1.6	3.7	7.5	<0.010	<3.5	<2.0	9.6	<3.9

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
MW-8 surface - downgradient																		
05-26640	MW-8	2005	1	Phase I	0	<1	<1	<20	<5	5.9	<10	<5	<15	<0.003	<10	4	**17**	12
05-26641 (Dup)	MW-8	2005	1	Phase I	0	<1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6	**20**	12
TP-7	MW-8	2006	2	Phase I	10	0.447	<0.5	2.9	<2	4.2	<2	<5	4.8	<0.01	<10	<5	<5	<5
P3-MW-8-1	MW-8	2007	3	Phase I	10	0.331	<0.5	3.6	<2	4.0	<30	<5	5.0	<0.01	<10	<5	**19**	6
P3-MW-8A	MW-8	2008	4	Phase I	10	<5	<0.5	2.5	<2	2.9	<2	<5	3.0	<0.05	<10	<30	<50	N/A
P309-8WA	MW-8	2009	5	Phase I	0-15	<1	<0.1	2.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	**17**	28
S511-027	MW-8	2011	7	Phase II	0-15	<2	<0.1	<5	1.7	5.1	<5	4.2	12.5	<0.45	<5	N/A	N/A	N/A
S511-028 (Interlab	MW-8	2011	7	Phase II	0-15	<1	<0.1	3.0	1.0	<5	<1	3.0	<10	<0.01	<12	<10	<10	<10
P314-8WA	MW-8	2014	10	Phase II	0-15	0.7	<0.01	4.0	2.0	5.1	<5	3.1	5.0	<0.10	<10	<50	<50	<100
MW-8A	MW-8	2019	15	Phase II	0-15	<1.0	<0.050	2.9	1.1	4.6	0.59	2.1	3.8	<0.010	<3.5	4.2	11	<4.7
MW-8 depth - downgradient																		
05-26642	MW-8	2005	1	Phase I	30	<1	<1	<20	<5	<5	<10	<5	<15	<0.003	**11**	5	<9	8
05-26643 (Dup)	MW-8	2005	1	Phase I	30	<1	<1	<20	<5	5.4	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-8	MW-8	2006	2	Phase I	50	0.903	<0.5	6.1	2.6	6.8	<2	<5	9.5	<0.01	<10	<5	<5	<5
P3-MW-8-2	MW-8	2007	3	Phase I	50	0.521	<0.5	3.8	<2	4.5	<30	<5	4.8	<0.01	<10	<5	**18**	15
P3-MW-8B	MW-8	2008	4	Phase I	50	<5	<0.5	4.1	<2	5.5	<2	<5	4.2	<0.05	<10	<30	<50	N/A
P3-MW-13B (Dup)	MW-8	2008	4	Phase I	50	<5	<0.5	3.3	<2	3.6	<2	<5	3.9	<0.05	<10	<30	<50	N/A
P3-MW-13B (Interl	MW-8	2008	4	Phase I	50	0.6	<0.2	3.0	1.0	4.0	0.9	3.0	6.0	<0.030	<5	<5	<5	N/A
P309-8WB	MW-8	2009	5	Phase I	40-50	<1	<0.1	2.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	13	11
S511-029	MW-8	2011	7	Phase II	40-50	<2	<0.1	<5	2.0	4.1	<5	4.3	12.3	<0.45	<5	N/A	N/A	N/A
S511-030 (Interlab	MW-8	2011	7	Phase II	40-50	<1	<0.1	4.0	2.0	<5	<1	3.0	<10	<0.01	<12	<10	<10	<10
P314-8WB	MW-8	2014	10	Phase II	40-50	0.6	<0.01	6.4	2.4	7.3	<5	4.6	5.0	<0.10	<10	<50	<50	<100
MW-8B	MW-8	2019	15	Phase II	40-50	<1.0	<0.050	3.2	1.3	3.7	1.1	2.3	4.0	<0.010	<3.5	3.1	11	<4.7

LEGEND

- TBM203 — TEMPORARY BENCHMARK
- BM-2 — PERMANENT BENCHMARK
- MW-5 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SAMPLE LOCATION

Legend for Tables

XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
20 0 20 40
1:000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	TA	CG

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Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

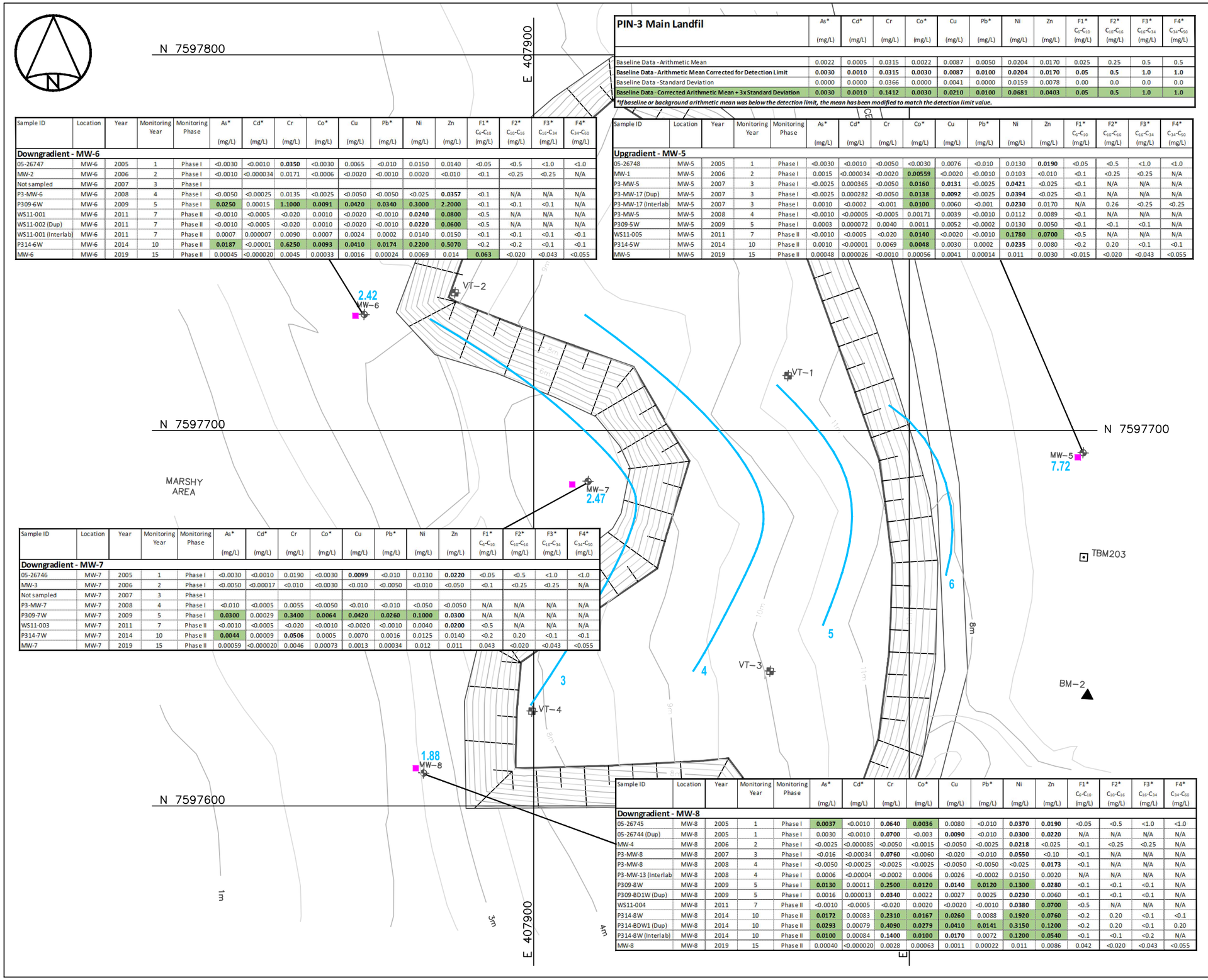
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING MAIN LANDFILL
2019 SOIL ANALYTICAL RESULTS

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MEASUREMENT UNIT:	SCALE:	DATE (month-year):
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: R. JANZEN	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO.: 30000251	DRAWING NO.: 30000251-PIN-3.2	PAGE: PL

FIGURE PIN-3.2C



PIN-3 Main Landfil

	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data - Arithmetic Mean	0.0022	0.0005	0.0315	0.0022	0.0087	0.0050	0.0204	0.0170	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit	**0.0030**	**0.0010**	**0.0315**	**0.0030**	**0.0087**	**0.0100**	**0.0204**	**0.0170**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation	0.0000	0.0000	0.0366	0.0000	0.0041	0.0000	0.0159	0.0078	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation	**0.0030**	**0.0010**	**0.1412**	**0.0030**	**0.0210**	**0.0100**	**0.0681**	**0.0403**	**0.05**	**0.5**	**1.0**	**1.0**

**If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Downgradient - MW-6																
05-26747	MW-6	2005	1	Phase I	<0.0030	<0.0010	**0.0350**	<0.0030	0.0065	<0.010	0.0150	0.0140	<0.05	<0.5	<1.0	<1.0
MW-2	MW-6	2006	2	Phase I	<0.0010	<0.000034	0.0171	<0.0006	<0.0020	<0.0010	0.0020	<0.010	<0.1	<0.25	<0.25	N/A
Not sampled	MW-6	2007	3	Phase I												
P3-MW-6	MW-6	2008	4	Phase I	<0.0050	<0.00025	0.0135	<0.0025	<0.0050	<0.0050	<0.025	**0.0357**	<0.1	N/A	N/A	N/A
P309-6W	MW-6	2009	5	Phase I	**0.0250**	0.00015	**1.1000**	**0.0091**	**0.0420**	**0.0340**	**0.3000**	**2.2000**	<0.1	<0.1	<0.1	N/A
WS11-001	MW-6	2011	7	Phase II	<0.0010	<0.0005	<0.020	0.0010	<0.0020	<0.0010	**0.0240**	**0.0800**	<0.5	N/A	N/A	N/A
WS11-002 (Dup)	MW-6	2011	7	Phase II	<0.0010	<0.0005	<0.020	0.0010	<0.0020	<0.0010	**0.0220**	**0.0600**	<0.5	N/A	N/A	N/A
WS11-001 (Interlab)	MW-6	2011	7	Phase II	0.0007	0.000007	0.0090	0.0007	0.0024	0.0002	0.0140	0.0150	<0.1	<0.1	<0.1	<0.1
P314-6W	MW-6	2014	10	Phase II	**0.0187**	<0.00001	**0.6250**	**0.0093**	**0.0410**	**0.0174**	**0.2200**	**0.5070**	<0.2	<0.2	<0.1	<0.1
MW-6	MW-6	2019	15	Phase II	0.00045	<0.000020	0.0045	0.00033	0.0016	0.00024	0.0069	0.014	**0.063**	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Upgradient - MW-5																
05-26748	MW-5	2005	1	Phase I	<0.0030	<0.0010	<0.0050	<0.0030	0.0076	<0.010	0.0130	**0.0190**	<0.05	<0.5	<1.0	<1.0
MW-1	MW-5	2006	2	Phase I	0.0015	<0.000034	<0.0020	**0.00559**	<0.0020	<0.0010	0.0103	<0.010	<0.1	<0.25	<0.25	N/A
P3-MW-5	MW-5	2007	3	Phase I	<0.0025	0.000365	<0.0050	**0.0160**	**0.0131**	<0.0025	**0.0421**	<0.025	<0.1	N/A	N/A	N/A
P3-MW-17 (Dup)	MW-5	2007	3	Phase I	<0.0025	0.000282	<0.0050	**0.0138**	**0.0092**	<0.0025	**0.0394**	<0.025	<0.1	N/A	N/A	N/A
P3-MW-17 (Interlab	MW-5	2007	3	Phase I	0.0010	<0.0002	<0.001	**0.0100**	0.0060	<0.001	**0.0230**	0.0170	N/A	0.26	<0.25	<0.25
P3-MW-5	MW-5	2008	4	Phase I	<0.0010	<0.00005	<0.0005	0.00171	0.0039	<0.0010	0.0112	0.0089	<0.1	N/A	N/A	N/A
P309-5W	MW-5	2009	5	Phase I	0.0003	0.000072	0.0040	0.0011	0.0052	<0.0002	0.0130	0.0050	<0.1	<0.1	<0.1	N/A
WS11-005	MW-5	2011	7	Phase II	<0.0010	<0.0005	<0.020	**0.0140**	<0.0020	<0.0010	**0.1780**	**0.0700**	<0.5	N/A	N/A	N/A
P314-5W	MW-5	2014	10	Phase II	0.0010	<0.00001	0.0069	**0.0048**	0.0030	0.0002	**0.0235**	0.0080	<0.2	0.20	<0.1	<0.1
MW-5	MW-5	2019	15	Phase II	0.00048	0.000026	<0.0010	0.00056	0.0041	0.00014	0.011	0.0030	<0.015	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Downgradient - MW-7																
05-26746	MW-7	2005	1	Phase I	<0.0030	<0.0010	0.0190	<0.0030	**0.0099**	<0.010	0.0130	**0.0220**	<0.05	<0.5	<1.0	<1.0
MW-3	MW-7	2006	2	Phase I	<0.0050	<0.00017	<0.010	<0.0030	<0.010	<0.0050	<0.010	<0.050	<0.1	<0.25	<0.25	N/A
Not sampled	MW-7	2007	3	Phase I												
P3-MW-7	MW-7	2008	4	Phase I	<0.010	<0.0005	0.0055	<0.0050	<0.010	<0.010	<0.050	<0.0050	N/A	N/A	N/A	N/A
P309-7W	MW-7	2009	5	Phase I	**0.0300**	0.00029	**0.3400**	**0.0064**	**0.0420**	**0.0260**	**0.1000**	**0.0300**	N/A	N/A	N/A	N/A
WS11-003	MW-7	2011	7	Phase II	<0.0010	<0.0005	<0.020	<0.0010	<0.0020	<0.0010	0.0040	**0.0200**	<0.5	N/A	N/A	N/A
P314-7W	MW-7	2014	10	Phase II	**0.0044**	0.00009	**0.0506**	0.0005	0.0070	0.0016	0.0125	0.0140	<0.2	0.20	<0.1	<0.1
MW-7	MW-7	2019	15	Phase II	0.00059	<0.000020	0.0046	0.00073	0.0013	0.00034	0.012	0.011	0.043	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Downgradient - MW-8																
05-26745	MW-8	2005	1	Phase I	**0.0037**	<0.0010	**0.0640**	**0.0036**	0.0080	<0.010	**0.0370**	**0.0190**	<0.05	<0.5	<1.0	<1.0
05-26744 (Dup)	MW-8	2005	1	Phase I	0.0030	<0.0010	**0.0700**	<0.003	**0.0090**	<0.010	**0.0300**	**0.0220**	N/A	N/A	N/A	N/A
MW-4	MW-8	2006	2	Phase I	<0.0025	<0.000085	<0.0050	<0.0015	<0.0050	<0.0025	**0.0218**	<0.025	<0.1	<0.25	<0.25	N/A
P3-MW-8	MW-8	2007	3	Phase I	<0.016	<0.00034	**0.0760**	<0.0060	<0.020	<0.010	**0.0550**	<0.10	<0.1	N/A	N/A	N/A
P3-MW-8	MW-8	2008	4	Phase I	<0.0050	<0.00025	<0.0025	<0.0025	<0.0050	<0.0050	<0.025	**0.0173**	<0.1	N/A	N/A	N/A
P3-MW-13 (Interlab	MW-8	2008	4	Phase I	0.0006	<0.00004	<0.0002	0.0006	0.0026	<0.0002	0.0150	0.0020	N/A	N/A	N/A	N/A
P309-8W	MW-8	2009	5	Phase I	**0.0130**	0.00011	**0.2500**	**0.0120**	**0.0140**	**0.0120**	**0.1300**	**0.0280**	<0.1	<0.1	<0.1	N/A
P309-8D1W (Dup)	MW-8	2009	5	Phase I	0.0016	0.000013	**0.0340**	0.0022	0.0027	0.0025	**0.0230**	0.0060	<0.1	<0.1	<0.1	N/A
WS11-004	MW-8	2011	7	Phase II	<0.0010	<0.0005	<0.020	0.0020	<0.0020	<0.0010	**0.0380**	**0.0700**	<0.5	N/A	N/A	N/A
P314-8W	MW-8	2014	10	Phase II	**0.0172**	0.00083	**0.2310**	**0.0167**	**0.0260**	0.0088	**0.1920**	**0.0760**	<0.2	0.20	<0.1	<0.1
P314-8DW1 (Dup)	MW-8	2014	10	Phase II	**0.0293**	0.00079	**0.4090**	**0.0279**	**0.0410**	**0.0141**	**0.3150**	**0.1200**	<0.2	0.20	<0.1	0.20
P314-8W (Interlab)	MW-8	2014	10	Phase II	**0.0100**	0.00084	**0.1400**	**0.0100**	**0.0170**	0.0072	**0.1200**	**0.0540**	<0.1	<0.1	<0.2	N/A
MW-8	MW-8	2019	15	Phase II	0.00040	<0.000020	0.0028	0.00063	0.0011	0.00022	0.011	0.0086	0.042	<0.020	<0.043	<0.055

LEGEND

- TBM203 — TEMPORARY BENCHMARK
- BM-2 — PERMANENT BENCHMARK
- MW-5 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SAMPLE LOCATION
- INTERPRETED GROUNDWATER FLOW CONTOURS
- 7.72 — GROUNDWATER ELEVATION (M.A.S.L.)

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
20 0 20 40
1:1000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	TA	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING MAIN LANDFILL
2019 GROUNDWATER ANALYTICAL RESULTS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE: (month–year):
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: R. JANZEN	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-PIN-3.2	PAGE PL

FIGURE PIN-3.2D

4 PIN-3: NWS LANDFILL

4.1 Landfill Description

The NWS Landfill is located approximately 700 metres west of the main station area, to the north of the Main Landfill. This area was used as a burn pit for waste material while the site was active. Waste materials were first burned and then covered with gravel. Prior to remediation, the depth of the landfill was estimated at 0.5 metres and a localized area of Tier II contaminated soil was identified.

The construction of this landfill included excavation of contaminated surficial soils, regrading, and capping with the placement of site derived granular fill. The long-term monitoring plan consists of visual monitoring and periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-3.3A** located at the end of this landfill section.

4.2 Summary of Work Conducted

4.2.1 Visual Inspection

Visual inspection of the NWS Landfill was conducted on 17 August 2019. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

4.2.2 Soil Sampling

Soil sampling at the NWS Landfill was conducted on August 17, 2019 and consisted of the collection of eight soil samples from four soil sample stations (P3-1, P3-2, P3-3, and P3-4). Depth limitations were encountered at soil sampling stations P3-1, where refusal on bedrock limited the depth sample from 0.2 to 0.28 mbgs, and at station P3-4, where refusal on bedrock limited the depth of sample from 0.35 to 0.4 mbgs. The following table outlines the soil sampling activities conducted at the NWS Landfill.

Table 4-1: Summary of Work Conducted by Soil Sampling Location - NWS Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P3-1 (upgradient)	P3-1A	0 – 0.15	Sand and organics, trace gavel, rootlets, greyish brown, dry
	P3-1B	0.2 – 0.28	Sand, some gravel, trace organics, greyish brown, dry, refusal on bedrock
P3-2 (downgradient)	P3-2A	0 – 0.15	Sand, some gavel and organics, rootlets, greyish brown, dry
	P2-2B	0.4 – 0.5	Sand and gravel, some cobbles, rootlets, greyish brown, dry
P3-3 (downgradient)	P3-3A	0 – 0.15	Sand and gravel, some organics, trace gavel, rootlets, greyish brown, dry

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
	P3-3B	0.4 – 0.5	Gravel, some sand, few cobbles, rootlets, greyish brown, dry
P3-4 (downgradient)	P3-4A	0 - 0.15	Sand, some gavel and organics, rootlets, greyish brown, dry
	P3-4B	0.35 – 0.4	Sand and gravel, few cobbles, greyish brown, dry, refusal on bedrock

4.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the NWS Landfill; therefore, no groundwater sampling or analysis was performed as part of the 2019 monitoring program.

4.2.4 Thermal Monitoring

No thermistors are present at the NWS Landfill; therefore, no thermal monitoring was performed as part of the 2019 monitoring program.

4.3 Results of the Monitoring Program

The following Sections 4.3.1 through 4.3.4 summarize the results of the PIN-3 monitoring program at the NWS Landfill.

4.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 4.3.1.1 through 4.3.1.5. **Figure PIN-3.3A** presents the visual inspection findings and photographic locations.

4.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR and the visual inspection checklist is included below.

Table 4-2: Visual Inspection Checklist – NWS Landfill

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: NWS Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 17 August 2019 WEATHER CONDITIONS: Overcast, breezy and cool.
DATE OF PREVIOUS INSPECTION: 17 August 2014
INSPECTED BY: Ryan Janzen
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.**

Table 4-2: Visual Inspection Checklist – NWS Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Y	B1 B2	East Lobe NW point, at crest East Lobe W point, at crest	7598032.141, 407989.384 7598006.800, 407950.545	12 North	0.75 2.0	0.5 1.3	0.15 0.15	<1%	Minor depression, fines infiltration. Minor depression, possibly a vehicle track.	Consistent. Wider than previously noted.	Acceptable.	NWS_5 NWS_8
Erosion	Y	C	Between the two easternmost lobes	7597986.656, 407939.175	12 North	7.2	0.3	0.05	<1%	Minor erosion.	Smaller than previously noted.	Acceptable. Leading to ponded water.	NWS_16
Lateral Movement	N												
Frost Action	N												
Sloughing	N												
Cracking	N												
Animal Burrows	N												
Vegetation Establishment	Y	D1 D2 D3 D4	Around ponded water. E lobe, south area. Central lobe, NE area. Central lobe, SW area.	7597982.358, 407936.235 7597959.227, 407947.746 7598013.668, 407931.549 7597991.812, 407894.676	12 North	78.5m^2 195m^2 42m^2 505m^2		NA	<1% ~2% <1% ~4%	Sparse vegetation.	NEW OBSERVATION. NEW OBSERVATION. Smaller than previously noted. Larger than previously noted.	Acceptable.	NWS_10, 13 NWS_11 NWS_17, 18 NWS_22, 23
Staining	N												
Vegetation Stress	N												
Seepage Points (or) Ponded Water	Y	A	Between E and central lobes	7597982.723, 407936.793	12 North	9m^2		0.3	<1%	Ponded water.	Consistent.	Acceptable.	NWS_9, 10, 13
Debris and/or Liner Exposed	N												
Presence & Condition of Monitoring Instruments	N												
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Y	E	Central lobe, NW corner	7598025.687, 407895.530	12 North	7.0	0.4	0.2	<1%	Vehicle ruts, construction relic.	NEW OBSERVATION.	Acceptable.	NWS_32

4.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the NWS Landfill was conducted on 17 August 2019 as per the TOR and the results are provided below.

Table 4-3: Preliminary Stability Assessment – NWS Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Occasional
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Acceptable	Isolated
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

4.3.1.3 Photographic Records

The detailed photographic record for the NWS Landfill has been completed as per Section 5.5 of the TOR and is included as Appendix I. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the separately appended CD/DVD-ROM. **Figure PIN-3.3A** illustrates the photograph locations and directions.

4.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the NWS Landfill. The following table outlines the results of the visual trend analysis. Features where no significant change was observed are not noted here.

Table 4-4: Visual Inspection Trends – NWS Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	B2	Observed width has increased from 0.4 m in 2014 to 1.3 m in 2019.
Erosion	C	Observed length has decreased from 15 m in 2014 to 7.2 m in 2019.
Vegetation Establishment	D1	New observation.
	D2	New observation.
	D3	Appears smaller than in 2014 (no measurements given previously).
	D4	Appears larger than in 2014 (no measurements given previously).
Other	E	New observation.

4.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2019 monitoring events at the NWS Landfill indicates that previously observed features generally either increased in size or saw no significant change. The minor erosion channel (Feature C) leading to the small pond appears to have shortened, likely due to erosive infill. Feature E (equipment ruts) is technically a new observation, but it is considered likely that it was present before. Vegetated areas appear to be expanding, with the exception of Feature D3 which appears to have shrunk; though there were no dimensions given from the 2014 program a comparison of observed areas against previous figures indicates larger areas in 2019. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

4.3.2 Soil Sampling

Soil sampling of the NWS Landfill was conducted on August 17, 2019. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR and details are provided below in the following sections.

4.3.2.1 Laboratory Analytical Results

A total of eight soil samples were collected from four soil sample locations at the NWS Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 2** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are

presented in **Appendix B** of this report. **Figure PIN-3.3B** presents a summary of current and historical soil analytical results and is located at the end of this landfill section.

4.3.2.2 Summary of Soil Results

The soil results for 2019 are presented in the following table. The background and baseline mean are presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 4-5: Evaluation of Results by Parameter - NWS Landfill

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Arsenic (As)	1.0	1.2	**3.3**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cadmium (Cd)	1.0	1.0	**1.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Chromium (Cr)	20.0	20.0	**20.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	5.0	5.0	**5.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Copper (Cu)	12.6	13.8	**40.2**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Lead (Pb)	10.0	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Nickel (Ni)	6.7	5.0	**12.6**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Zinc (Zn)	16.4	15.0	**15.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
PCBs (Total)	0.10	0.10	**0.10**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F1 (C_6-C_{10})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F2 (C_{10}-C_{16})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F3 (C_{16}-C_{34})	N/A	79.7	**439.5**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F4 (C_{34}-C_{50})	N/A	57.4	**331.3**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

4.3.2.3 Discussion of Soil Results

All upgradient and downgradient soil sample results at the NWS Landfill were below the BL+3SD for all parameters. Concentrations of arsenic, copper and nickel were detected at levels above the baseline mean in some soil samples but were below the landfill's historical baseline maximums for each parameter.

Overall, the 2019 upgradient soil results were comparable to downgradient results and there is no indication of contaminant migration from the landfill at this time.

It should be noted that there is less than seven sampling events worth of soil data available at this time and, as such, a trend evaluation was not completed as part of the 2019 monitoring program. The performance of the landfill should be re-evaluated once seven sampling events worth of data are available.

4.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the NWS Landfill; therefore, no groundwater sampling or analysis was conducted.

4.3.4 Thermal Monitoring

No thermistors are present at the NWS Landfill; therefore, no thermal monitoring was conducted.

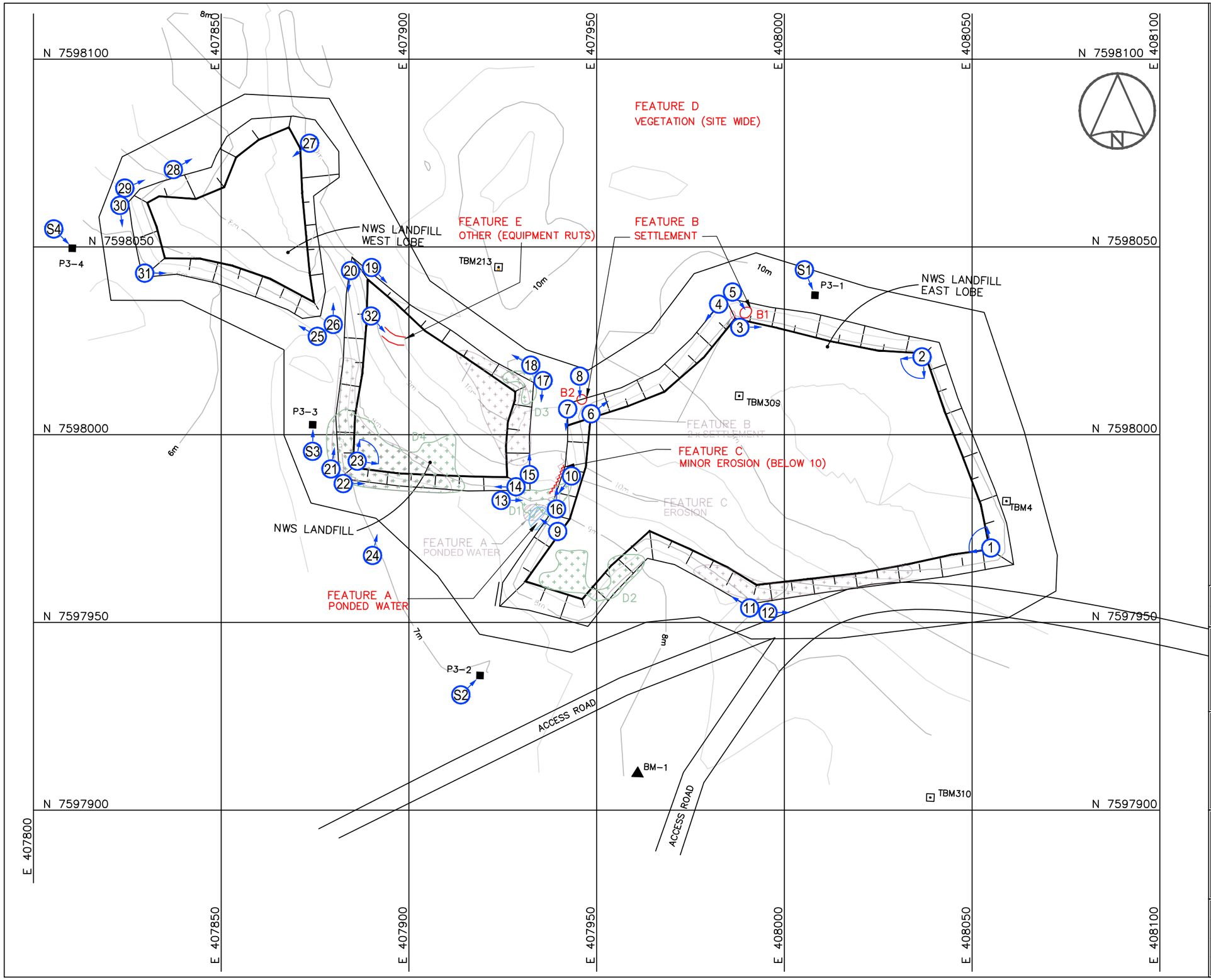
4.4 Overall Landfill Performance, Conclusions and Recommendations

All upgradient and downgradient soil concentrations measured 2019 at the NWS Landfill were below the BL+3SD for all parameters. As the 2019 monitoring program is only the sixth monitoring program to have been conducted at this landfill, trends in soil concentrations have not been evaluated. However, based on the limited chemical data collected to date and observations made during the 2019 field program, the landfill appears to be performing as intended with no indications of potential contaminant migration.

Based on this review, it is recommended to continue the long-term monitoring of soils as planned and the performance of the landfill be re-evaluated once seven monitoring events worth of data are available.

Based on the results of the visual inspection, the NWS landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

Based on the results of the 2019 monitoring program, the overall performance of the NWS Landfill is acceptable.



LEGEND

- TBM203 — TEMPORARY BENCHMARK
- BM-2 — PERMANENT BENCHMARK
- MONITORING SAMPLE LOCATION
- SETTLEMENT
- EROSION
- SPARSE VEGETATION
- PONDED WATER
- APPROX. PHOTOGRAPHIC VIEWPOINT (2019)
- OTHER (EQUIPMENT RUTS)
- 2014 VISUAL INSPECTION OBSERVATIONS (FOR REFERENCE)

NOTE:
RED = 2019 FEATURES
PURPLE = 2014 FEATURES

Meters
20 0 20 40
1:1000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

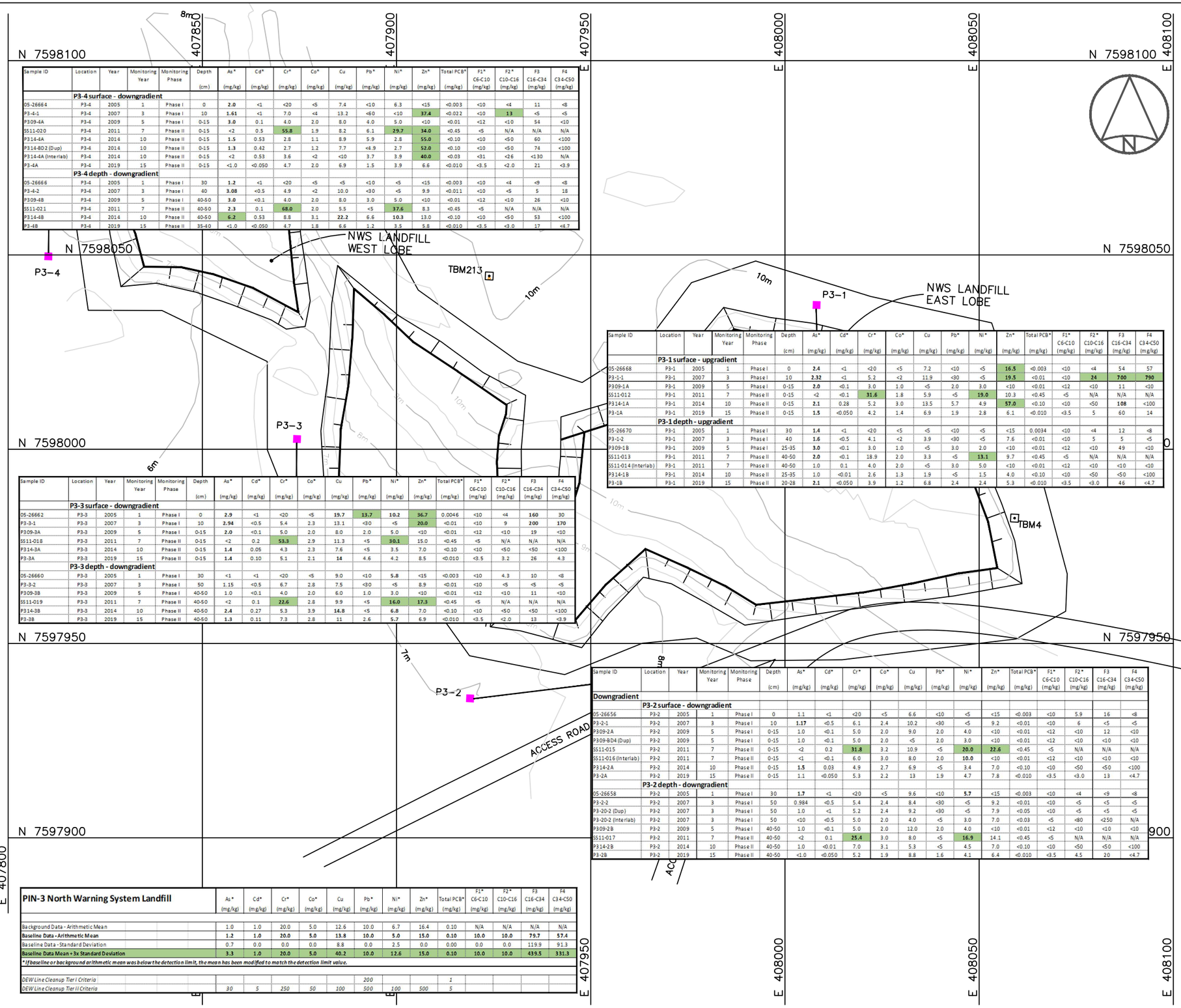
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING NWS LANDFILL
2019 & 2014 VISUAL INSPECTION

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE:	COMPLETION DATE:
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: R. JANZEN	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-PIN-3.3	PAGE: PL

FIGURE PIN-3.3A



Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-4 surface - downgradient																		
05-26664	P3-4	2005	1	Phase I	0	**2.0**	<1	<20	<5	7.4	<10	6.3	<15	<0.003	<10	<4	11	<8
P3-4-1	P3-4	2007	3	Phase I	10	**1.61**	<1	7.0	<4	13.2	<60	<10	**37.4**	<0.022	<10	**13**	<5	<5
P309-4A	P3-4	2009	5	Phase I	0-15	**3.0**	0.1	4.0	2.0	8.0	4.0	5.0	<10	<0.01	<12	<10	54	<10
SS11-020	P3-4	2011	7	Phase II	0-15	<2	0.5	**55.8**	1.9	8.2	6.1	**29.7**	**34.0**	<0.45	<5	N/A	N/A	N/A
P314-4A	P3-4	2014	10	Phase II	0-15	**1.5**	0.53	2.8	1.1	8.9	5.9	2.8	**55.0**	<0.10	<10	<50	60	<100
P314-BD2 (Dup)	P3-4	2014	10	Phase II	0-15	**1.3**	0.42	2.7	1.2	7.7	<4.9	2.7	**52.0**	<0.10	<10	<50	74	<100
P314-4A (Interlab)	P3-4	2014	10	Phase II	0-15	<2	0.53	3.6	<2	<10	3.7	3.9	**40.0**	<0.03	<31	<26	<130	N/A
P3-4A	P3-4	2019	15	Phase II	0-15	<1.0	<0.050	4.7	2.0	6.9	1.5	3.9	6.6	<0.010	<3.5	<2.0	21	<3.9
P3-4 depth - downgradient																		
05-26666	P3-4	2005	1	Phase I	30	**1.2**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-4-2	P3-4	2007	3	Phase I	40	**3.08**	<0.5	4.9	<2	10.0	<30	<5	9.9	<0.011	<10	<5	5	18
P309-4B	P3-4	2009	5	Phase I	40-50	**3.0**	<0.1	4.0	2.0	8.0	3.0	5.0	<10	<0.01	<12	<10	26	<10
SS11-021	P3-4	2011	7	Phase II	40-50	**2.3**	0.1	**68.0**	2.0	5.5	<5	**37.6**	8.3	<0.45	<5	N/A	N/A	N/A
P314-4B	P3-4	2014	10	Phase II	40-50	**6.2**	0.53	8.8	3.1	**22.2**	6.6	**10.3**	13.0	<0.10	<10	<50	53	<100
P3-4B	P3-4	2019	15	Phase II	35-40	<1.0	<0.050	4.7	1.8	6.6	1.2	3.5	5.8	<0.010	<3.5	<3.0	17	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-1 surface - upgradient																		
05-26668	P3-1	2005	1	Phase I	0	**2.4**	<1	<20	<5	7.2	<10	<5	**16.5**	<0.003	<10	<4	54	57
P3-1-1	P3-1	2007	3	Phase I	10	**2.32**	<1	5.2	<2	11.9	<30	<5	**19.5**	<0.01	<10	**24**	**700**	**790**
P309-1A	P3-1	2009	5	Phase I	0-15	**2.0**	<0.1	3.0	1.0	<5	2.0	3.0	<10	<0.01	<12	<10	11	<10
SS11-012	P3-1	2011	7	Phase II	0-15	<2	<0.1	**31.6**	1.8	5.9	<5	**19.0**	10.3	<0.45	<5	N/A	N/A	N/A
P314-1A	P3-1	2014	10	Phase II	0-15	**2.1**	0.28	5.2	3.0	13.5	5.7	4.9	**57.0**	<0.10	<10	<50	**108**	<100
P3-1A	P3-1	2019	15	Phase II	0-15	**1.5**	<0.050	4.2	1.4	6.9	1.9	2.8	6.1	<0.010	<3.5	5	60	14
P3-1 depth - upgradient																		
05-26670	P3-1	2005	1	Phase I	30	**1.4**	<1	<20	<5	<5	<10	<5	<15	0.0034	<10	<4	12	<8
P3-1-2	P3-1	2007	3	Phase I	40	**1.6**	<0.5	4.1	<2	3.9	<30	<5	7.6	<0.01	<10	5	5	<5
P309-1B	P3-1	2009	5	Phase I	25-35	**3.0**	<0.1	3.0	1.0	<5	3.0	2.0	<10	<0.01	<12	<10	49	<10
SS11-013	P3-1	2011	7	Phase II	40-50	**2.0**	<0.1	18.9	2.0	3.3	<5	**13.1**	9.7	<0.45	<5	N/A	N/A	N/A
SS11-014 (Interlab)	P3-1	2011	7	Phase II	40-50	1.0	0.1	4.0	2.0	<5	3.0	5.0	<10	<0.01	<12	<10	<10	<10
P314-1B	P3-1	2014	10	Phase II	25-35	1.0	<0.01	2.6	1.3	1.9	<5	1.5	4.0	<0.10	<10	<50	<50	<100
P3-1B	P3-1	2019	15	Phase II	20-28	**2.1**	<0.050	3.9	1.2	6.8	2.4	2.4	5.3	<0.010	<3.5	<3.0	46	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-3 surface - downgradient																		
05-26662	P3-3	2005	1	Phase I	0	**2.9**	<1	<20	<5	**19.7**	**13.7**	**10.2**	**36.7**	0.0046	<10	<4	**160**	30
P3-3-1	P3-3	2007	3	Phase I	10	**2.94**	<0.5	5.4	2.3	13.1	<30	<5	**20.0**	<0.01	<10	9	**200**	**170**
P309-3A	P3-3	2009	5	Phase I	0-15	**2.0**	<0.1	5.0	2.0	8.0	2.0	5.0	<10	<0.01	<12	<10	19	<10
SS11-018	P3-3	2011	7	Phase II	0-15	<2	0.2	**53.3**	2.9	11.3	<5	**30.1**	15.0	<0.45	<5	N/A	N/A	N/A
P314-3A	P3-3	2014	10	Phase II	0-15	**1.4**	0.05	4.3	2.3	7.6	<5	3.5	7.0	<0.10	<10	<50	<50	<100
P3-3A	P3-3	2019	15	Phase II	0-15	**1.4**	0.10	5.1	2.1	**14**	4.6	4.2	8.5	<0.010	<3.5	3.2	26	4.3
P3-3 depth - downgradient																		
05-26660	P3-3	2005	1	Phase I	30	<1	<1	<20	<5	9.0	<10	**5.8**	<15	<0.003	<10	4.3	10	<8
P3-3-2	P3-3	2007	3	Phase I	50	1.15	<0.5	6.7	2.8	7.5	<30	<5	8.9	<0.01	<10	<5	<5	<5
P309-3B	P3-3	2009	5	Phase I	40-50	1.0	<0.1	4.0	2.0	6.0	1.0	3.0	<10	<0.01	<12	<10	11	<10
SS11-019	P3-3	2011	7	Phase II	40-50	<2	0.1	**22.6**	2.8	9.9	<5	**16.0**	**17.3**	<0.45	<5	N/A	N/A	N/A
P314-3B	P3-3	2014	10	Phase II	40-50	**2.4**	0.27	5.3	3.9	**14.8**	<5	**6.8**	7.0	<0.10	<10	<50	<50	<100
P3-3B	P3-3	2019	15	Phase II	40-50	**1.3**	0.11	7.3	2.8	11	2.6	**5.7**	6.9	<0.010	<3.5	<2.0	13	<3.9

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Downgradient																		
P3-2 surface - downgradient																		
05-26656	P3-2	2005	1	Phase I	0	1.1	<1	<20	<5	6.6	<10	<5	<15	<0.003	<10	5.9	16	<8
P3-2-1	P3-2	2007	3	Phase I	10	**1.17**	<0.5	6.1	2.4	10.2	<30	<5	9.2	<0.01	<10	6	<5	<5
P309-2A	P3-2	2009	5	Phase I	0-15	1.0	<0.1	5.0	2.0	9.0	2.0	4.0	<10	<0.01	<12	<10	12	<10
P309-BD4 (Dup)	P3-2	2009	5	Phase I	0-15	1.0	<0.1	5.0	2.0	<5	2.0	3.0	<10	<0.01	<12	<10	<10	<10
SS11-015	P3-2	2011	7	Phase II	0-15	<2	0.2	**31.8**	3.2	10.9	<5	**20.0**	**22.6**	<0.45	<5	N/A	N/A	N/A
SS11-016 (Interlab)	P3-2	2011	7	Phase II	0-15	<1	<0.1	6.0	3.0	8.0	2.0	**10.0**	<10	<0.01	<12	<10	<10	<10
P314-2A	P3-2	2014	10	Phase II	0-15	**1.5**	0.03	4.9	2.7	6.9	<5	3.4	7.0	<0.10	<10	<50	<50	<100
P3-2A	P3-2	2019	15	Phase II	0-15	1.1	<0.050	5.3	2.2	13	1.9	4.7	7.8	<0.010	<3.5	<3.0	13	<4.7
P3-2 depth - downgradient																		
05-26658	P3-2	2005	1	Phase I	30	**1.7**	<1	<20	<5	9.6	<10	**5.7**	<15	<0.003	<10	<4	<9	<8
P3-2-2	P3-2	2007	3	Phase I	50	0.984	<0.5	5.4	2.4	8.4	<30	<5	9.2	<0.01	<10	<5	<5	<5
P3-20-2 (Dup)	P3-2	2007	3	Phase I	50	1.0	<1	5.2	2.4	9.2	<30	<5	7.9	<0.05	<10	<5	<5	<5
P3-20-2 (Interlab)	P3-2	2007	3	Phase I	50	<10	<0.5	5.0	2.0	4.0	<5	3.0	7.0	<0.03	<5	<80	<250	N/A
P309-2B	P3-2	2009	5	Phase I	40-50	1.0	<0.1	5.0	2.0	12.0	2.0	4.0	<10	<0.01	<12	<10	<10	<10
SS11-017	P3-2	2011	7	Phase II	40-50	<2	0.1	**25.4**	3.0	8.0	<5	**16.9**	14.1	<0.45	<5	N/A	N/A	N/A
P314-2B	P3-2	2014	10	Phase II	40-50	1.0	<0.01	7.0	3.1	5.3	<5	4.5	7.0	<0.10	<10	<50	<50	<100
P3-2B	P3-2	2019	15	Phase II	40-50	<1.0	<0.050	5.2	1.9	8.8	1.6	4.1	6.4	<0.010	<3.5	4.5	20	<4.7

PIN-3 North Warning System Landfill	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**1.2**	**1.0**	**20.0**	**5.0**	**13.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**79.7**	**57.4**
Baseline Data - Standard Deviation	0.7	0.0	0.0	0.0	8.8	0.0	2.5	0.0	0.00	0.0	0.0	119.9	91.3
Baseline Data Mean + 3x Standard Deviation	**3.3**	**1.0**	**20.0**	**5.0**	**40.2**	**10.0**	**12.6**	**15.0**	**0.10**	**10.0**	**10.0**	**439.5**	**331.3**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

TBM203 ⊡ TEMPORARY BENCHMARK

BM-2 ▲ PERMANENT BENCHMARK

■ MONITORING SAMPLE LOCATION

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters

20 0 20 40

1:1000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	*RF*	*RJ*	*CG*

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING NWS LANDFILL
2019 SOIL ANALYTICAL RESULTS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	*R. JANZEN*	*C. GRAVELLE, P.ENG*
PROJECT NO:	DRAWING NO:	PAGE
30000251	30000251-PIN-3.3	PL

FIGURE PIN-3.3B

5 PIN-3: SOUTH LANDFILL

5.1 Landfill Description

The South Landfill is located approximately 1,450 metres south of the main station area. The construction of this landfill included the complete excavation of a lobe previously situated south of the road, combined with regrading of the lobes north of the road and placement of additional granular fill.

The long-term monitoring plan for the South Landfill consists of visual inspections and the periodic collection of soil samples. The landfill layout, visual observations and photographic locations are presented on **Figure PIN-3.4A**, located at the end of this landfill section.

5.2 Summary of Work Conducted

5.2.1 Visual Inspection

A visual inspection was conducted on the South Landfill on 18 August 2019. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

5.2.2 Soil Sampling

Soil sampling at the South Landfill was conducted on August 18, 2019 and consisted of the collection of 14 soil samples from seven soil sample stations (P3-5, P3-6, P3-7, P3-8, P3-9, P3-10, and P3-11). One blind field duplicate (sample P3-19B) was collected at station P3-11 at depth. The following table outlines the soil sampling activities conducted at the South Landfill.

Table 5-1: Summary of Work Conducted by Soil Sampling Location – South Landfill

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
P3-5 (upgradient)	P3-5A	0 – 0.15	Sand and organics, trace gravel, rootlets, dark brown, moist,
	P3-5B	0.4 – 0.5	Loamy sand and gravel, some organics, dark brown, wet, water encountered at 0.22 mbgs
P3-6 (downgradient)	P2-6A	0 – 0.15	Sand, some gravel, trace organics, rootlets, greyish brown, moist
	P2-6B	0.4 – 0.5	Sand, some gravel, few cobbles, trace organics, greyish brown, wet, water encountered at 0.33 mbgs
P3-7 (downgradient)	P2-7A	0 – 0.15	Sand and gravel, some cobble, trace organics, rootlets, greyish brown, moist
	P2-7B	0.4 – 0.5	Sand and cobbles, some gravel, trace organics, greyish brown, wet, water encountered at 0.36 mbgs

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
P3-8 (downgradient)	P2-8A	0 – 0.15	Sand and gravel, rootlets, greyish brown, moist
	P2-8B	0.4 – 0.5	Sand and gravel, some cobbles, rootlets, greyish brown, wet, water encountered at 0.38 mbgs
P3-9 (upgradient)	P3-9A	0 – 0.15	Stratified sand and gravel, rootlets, greyish brown, moist
	P3-9B	0.4 – 0.5	Sand and cobbles, some gravel, greyish brown, wet, water encountered at 0.34 mbgs
P3-10 (downgradient)	P3-10A	0 - 0.15	Sand and organics, some silt, rootlets, greyish brown, moist
	P3-10B	0.4 – 0.5	Sand and cobbles, some gravel, trace organics, greyish brown, wet, water encountered at 0.32 mbgs
P3-11(downgradient)	P3-11A	0 – 0.15	Sand and organics, some silt, rootlets, brown, wet, water encountered at 0.03 mbgs
	P3-11B	0.4 – 0.5	Loamy sand, some gravel and cobble, trace organics, dark grey, wet

5.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the South Landfill; therefore, no groundwater sampling or analysis was performed as part of the 2019 monitoring program.

5.2.4 Thermal Monitoring

No thermistors are present at the South Landfill; therefore, no thermal monitoring was performed as part of the 2019 monitoring program.

5.3 Results of the Monitoring Program

The following Sections 5.3.1 through 5.3.4 summarize the results of the PIN-3 monitoring program at the South Landfill.

5.3.1 Visual Inspection

The visual inspection of the South Landfill was conducted on 18 August 2019. The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 5.3.1.1 through 5.3.1.5. **Figure PIN-3.4A** presents the visual inspection findings and photographic locations.

5.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR and the visual inspection checklist is included below.

Table 5-2: Visual Inspection Checklist – South Landfill

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: South Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 18 August 2019 WEATHER CONDITIONS: Mixed sun and cloud, breezy.
DATE OF PREVIOUS INSPECTION: 18 August 2014
INSPECTED BY: Ryan Janzen
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.**

Table 5-2: Visual Inspection Checklist – South Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Y	I	E lobe cap, southern end.	7596441.957, 408852.393 12 North	50m^2		0.3	<1%	Subtle area depression. Potentially purposefully graded this way, funnels runoff to pond.	Consistent.	Acceptable.	SLF_15
Settlement	Y	J1 J2	E lobe, NE slope. E lobe, SW slope.	7596482.550, 408867.045 12 North 7596450.728, 408809.595 12 North	0.3 5.0	0.3 0.9	0.2 0.1	<1% <1%	Minor depression.	Consistent. Larger than previously noted.	Acceptable.	SLF_16 SLF_24
Erosion	N											
Lateral Movement	N											
Frost Action	N											
Sloughing	N											
Cracking	N											
Animal Burrows	N											
Vegetation Establishment	Y	O1 O2 O3	Entire E lobe. Sloped area of NW lobe. Sloped area of SW lobe.	7596465.439, 408845.922 12 North 7596489.961, 408703.386 12 North 7596443.982, 408705.771 12 North	4500m^2 450m^2 200m^2		NA	~50% ~5% ~2%	Sparse vegetation.	Larger than previously noted.	Acceptable.	SLF_11 SLF_48 SLF_30
Staining	Y	A	W of NW lobe.	7596490.365, 408666.023 12 North	43m^2		NA	<1%	Orange staining.	Significantly larger than previously noted.	Acceptable.	SLF_45, 46
Staining	Y	B	E of NW lobe.	7596486.812, 408738.447 12 North	70m^2		NA	<1%	Orange staining. Adjacent ponded water.	Significantly larger than previously noted.	Acceptable.	SLF_37
Staining	Y	C	S of E lobe.	7596427.857, 408858.456 12 North	104m^2		NA	<1%	Orange staining. Adjacent ponded water.	Significantly larger than previously noted.	Acceptable.	SLF_10, 17-21
Staining	Y	K	E of E lobe.	7596469.574, 408888.176 12 North	178m^2		NA	~1%	Orange staining. Adjacent ponded water.	Significantly larger than previously noted.	Acceptable.	SLF_6 through 8
Vegetation Stress	N											
Seepage Points (or) Ponded Water	Y	D	Not observed.	NA	12 North	NA	NA	NA	NA	Seepage point – location not noted on previous report.	Feature not observed.	Not observed.	NA
Seepage Points (or) Ponded Water	Y	E	Not observed.	NA	12 North	NA	NA	NA	NA	Seepage point – location not noted on previous report.	Feature not observed.	Not observed.	NA

Table 5-2: Visual Inspection Checklist – South Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Seepage Points (or) Ponded Water	Y	M1	E of E lobe.	7596438.788, 408880.445 12 North	5.5m^2		0.1	NA (not inside footprint)	Ponded water.	Consistent.	Acceptable. Surrounding area is low, marshy shoreline. Ponded water present throughout immediate landscape.	SLF_13
		M2	S of E lobe.	7596427.774, 408855.653 12 North	25m^2		0.2					SLF_17
		M3	W of E lobe.	7596445.946, 408804.982 12 North	46.5m^2		0.3					SLF_25, 29
		M4	W of E lobe.	7596455.594, 408801.031 12 North	27m^2		0.3					SLF_25, 29
		M5	E of NW lobe.	7596484.346, 408738.460 12 North	4.5m^2		0.05					SLF_36 through 38
		M6	E of NW lobe.	7596491.020, 408737.217 12 North	12.5m^2		0.05					SLF_37, 38
		M7	N of NW lobe.	7596516.651, 408699.984 12 North	140m^2		0.5					SLF_42, 43
Debris and/or Liner Exposed	N	F	Not observed.	NA	12 North	NA	NA	NA	NA	Feature not observed – surface debris potentially removed.	Feature not observed.	Not observed.	SLF_49 (shows area)
Debris and/or Liner Exposed	Y	G	E of SW lobe.	7596443.228, 408731.643	12 North	0.05	0.05	NA	<1%	Small piece of partially buried embedded debris (metal).	Consistent.	Acceptable. Not on landfill footprint.	SLF_31
Debris and/or Liner Exposed	Y	H	E of NW lobe.	Removed.	12 North	0.3	0.05	NA	<1%	Small piece of surface debris (metal).	Consistent.	Acceptable. Not on landfill footprint.	SLF_34, 35
Debris and/or Liner Exposed	Y	L	NE of E lobe.	7596489.588, 408871.757	12 North	0.4	0.2	NA	<1%	End of buried drum (metal).	Consistent.	Acceptable. Not on landfill footprint.	SLF_1
Debris and/or Liner Exposed	Y	N	E slope of SW lobe.	7596446.007, 408723.792	12 North	0.15	0.05	NA	<1%	Small piece of partially exposed embedded debris (metal).	NEW OBSERVATION.	Acceptable.	SLF_50
Presence & Condition of Monitoring Instruments	N												
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	N												

5.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the South Landfill was conducted on 18 August 2019 as per the TOR and the results are provided below.

Table 5-3: Preliminary Stability Assessment – South Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable.	Occasional
Erosion	Not Observed	None
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Extensive
Staining	Acceptable	Occasional
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Acceptable	Numerous
Debris and/or Liner Exposure	Acceptable	Occasional
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

5.3.1.3 Photographic Records

The detailed photographic record for the South Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The photographic record contains an index of photographs collected; full sized photographs are contained in an Appended CD/DVD-ROM, separate to this report. **Figure PIN-3.4A** illustrates the photograph locations and directions.

5.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the South Landfill. The following table outlines the results of the visual trend analysis. Features where there was no significant change observed are not listed here.

Table 5-4: Visual Inspection Trends – South Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	J2	Observed size has increased from 1.5m^2 in 2014 to 4.5m^2 in 2019.
Vegetation Establishment	O	Appears larger than previously noted (no measurements given previously).
Staining	A	Observed size has increased from 14m^2 in 2014 to 43m^2 in 2019.
	B	Observed size has increased from 0.28m^2 in 2014 to 70m^2 in 2019.
	C	Observed size has increased from 32m^2 in 2014 to 104m^2 in 2019.
	K	Observed size has increased from 2.5m^2 in 2014 to 178m^2 in 2019.
Exposed Debris	F	Not observed in 2019.
	H	Removed (small piece of metal at surface).
	N	New observation.

5.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2019 monitoring events at the South Landfill indicates that one settlement feature increased slightly in size. Vegetated areas appear to be expanding; though there were no dimensions given from the 2014 program, a comparison of observed areas against previous figures indicates larger vegetated areas in 2019. Areas of staining have increased significantly in size, although it should be noted that areas of staining were observed throughout the area and are not limited to the area immediately adjacent the landfill. Small surface debris features were either not observed in 2019 (Feature F) or were removed (Feature H). One instance of exposed debris (Feature N) was newly observed – this was also the only instance of debris actually located inside the landfill footprint. Based on its location and given that it was firmly buried, this piece of exposed debris was most likely put in place during the landfill construction activities and has since become exposed. This debris does not represent a stability problem and is not considered to be of significant concern. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

5.3.2 Soil Sampling

Soil sampling of the South Landfill was conducted on August 18, 2019. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR and details are provided below in the following sections.

5.3.2.1 Laboratory Analytical Results

A total of 15 soil samples (including one field duplicate) were collected from seven soil sample locations at the South Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 3** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-3.4B** presents a summary of current and historical soil analytical results and is located at the end of this landfill section.

5.3.2.2 Summary of Soil Results

The soil results for 2019 are presented in the following table. The background and baseline mean are presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 5-5: Evaluation of Results by Parameter – South Landfill

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Arsenic (As)	1.0	1.0	**2.3**	Downgradient samples from P3-7 at surface and depth exceeded the BL+3SD at 3.7 and 2.6 mg/kg respectively. All upgradient and remaining downgradient results were below the BL+3SD.
Cadmium (Cd)	1.0	1.0	**1.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Chromium (Cr)	20.0	20.0	**20.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	5.0	5.0	**5.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Copper (Cu)	12.6	10.1	**24.6**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Lead (Pb)	10.0	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Nickel (Ni)	6.7	5.0	**5.0**	Downgradient samples from P3-7 at surface and depth exceeded the BL+3SD at 6.1 and 5.3 mg/kg respectively. In addition, the downgradient sample from P3-8 at surface exceeded the BL+3SD at 5.6 mg/kg. Lastly, the downgradient sample from P3-11B at depth exceeded the BL+3SD at 5.1 mg/kg. However, all four exceedances were within 3 times the baseline mean. All upgradient and remaining downgradient results were below the BL+3SD.
Zinc (Zn)	16.4	15.0	**15.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
PCBs (Total)	0.1	0.1	**0.1**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F1 (C_6-C_{10})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F2 (C_{10}-C_{16})	N/A	10.0	**10.0**	Upgradient samples from P3-9 at surface and depth exceeded the BL+3SD at 39 and 14 mg/kg respectively. All downgradient and remaining upgradient results were below the BL+3SD.

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
F3 (C_{16}-C_{34})	N/A	45.8	**156.1**	The downgradient sample from P3-11 at surface exceeded the BL+3SD at 200 mg/kg. All upgradient and remaining downgradient results were below the BL+3SD. It should be noted that a baseline concentration of 930 mg/kg was measured in a surface sample collected at P3-11 in 2004.
F4 (C_{34}-C_{50})	N/A	24.3	**91.8**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

5.3.2.3 Discussion of Soil Results

All 2019 upgradient results at surface and depth were below the BL+3SD for all parameters with the exception of PHC F2. PHC F2 concentrations of 39 mg/kg and 14 mg/kg were detected at surface and depth at upgradient location P3-9, respectively. Both results exceed the BL+3SD value of 10 mg/kg; however, the PHC F2 concentration at depth (14 mg/kg) is within three times the baseline mean of 30 mg/kg. This is worth noting because the baseline mean for PHC F2 was set to the analytical detection limit at the time of the site investigations and no standard deviation was calculated. Although the PHC F2 concentration at surface (39 mg/kg) exceeds both the BL+3SD value (10 mg/kg) and three times the baseline mean (30 mg/kg), it is less than PHC F2 concentrations historically reported for soil samples collected at depth from location P3-9 which have been as high as 230 mg/kg. In addition, one baseline sample collected at depth at location P3-9 was reported to have PHC F2 concentration of 14 mg/kg in 2004. It should also be noted that the action level for PHC remediation at DEW Line sites is typically 2,500 mg/kg; therefore, detectible hydrocarbon contamination below this concentration is not uncommon in the vicinity of the landfills. The PHC F2 concentrations at upgradient station P3-9 were therefore considered to be representative of historical variability in data and well below the DEW Line site remediation PHC criterion.

Downgradient soil results above the BL+3SD for arsenic, nickel and PHC F3 were reported at the South Landfill in 2019.These exceedances are discussed further below.

Exceedances of arsenic were detected at a single sample location at the South Landfill. These exceedances were located at downgradient sample location P3-7. Both the surface and depth soil samples from location P3-7 slightly exceeded the BL+3SD for arsenic of 2.3 mg/kg at 3.7 mg/kg and 2.6 mg/kg respectively. All other arsenic results at the landfill in 2019 were below the BL+3SD. It is worth noting that the maximum baseline concentration of arsenic reported was 2.3 mg/kg in 2000 and arsenic concentrations up to 4.7 mg/kg have been detected at the South landfill since then. Overall, there is insufficient data points at this time to suggest that the arsenic exceedances detected at the South Landfill are an indication of contaminant migration from the landfill.

Concentrations of nickel exceeding the BL+3SD of 5.0 mg/kg were detected at three downgradient soil sample stations (P3-7, P3-8 and P3-11) at the South Landfill. These exceedances ranged between 5.1 to 6.1 mg/kg. However, all three exceedances were within 3 times the baseline mean and are likely due to natural variability given that the baseline mean for nickel was set to the analytical detection limit and no standard deviation was calculated.

An exceedance of PHC F3 was detected at a single sample location at the South Landfill. The downgradient sample from P3-11 at surface exceeded the BL+3SD at 200 mg/kg. All upgradient and remaining downgradient results were below the BL+3SD. Based on the organic material observed in sample P3-11A and a review of the sample's PHC F2 and F3b concentrations, the PHC F3 exceedance detected is likely due to natural biogenic organic compounds. Accordingly, this PHC F3 exceedance is therefore not suspected to be an indication of contaminant migration from the landfill.

As seven sampling events worth of soil data has yet to be collected, a trend evaluation has not been completed as part of the 2019 monitoring program. The performance of the landfill should be re-evaluated once the laboratory results from seven sampling events are available. Furthermore, both arsenic and PHC F2 results should be examined in the next monitoring event to determine if concentrations are increasing at downgradient soil sampling stations.

5.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the South Landfill; therefore, no groundwater sampling or analysis was conducted as part of the 2019 monitoring program.

5.3.4 Thermal Monitoring

No thermistors are present at the South Landfill; therefore, no thermal monitoring was conducted as part of the 2019 monitoring program.

5.4 Overall Landfill Performance, Conclusions and Recommendations

As the 2019 monitoring program is only the sixth monitoring program to have been conducted at the South Landfill, trends in soil concentrations have not been evaluated. However, based on the limited chemical data collected to date and observations made during the 2019 field program, the landfill appears to be performing as intended with no apparent indications of contaminant migration.

Based on this review, it is recommended to continue the long-term monitoring of soils as planned and the performance of the landfill be re-evaluated once the results from seven monitoring events of data are available. In addition, both arsenic and PHC F2 results should be examined closely in the next monitoring event to determine if concentrations are increasing at downgradient soil sampling stations.

Based on the results of the visual inspection, the South Landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time, though the subsequent monitoring events should be sure to measure the noted stained areas and compare to previous events measurements.

Based on the results of the 2019 monitoring program, the overall performance of the South Landfill is acceptable.

E 408650
E 408700
E 408750
E 408800
E 408850
E 408900
N 7596550
N 7596500
N 7596450
N 7596400
N 7596350
FEATURE M
PONDED WATER
(MULTIPLE LOCATIONS)
FEATURE O
VEGETATION
(MULTIPLE LOCATIONS)
FEATURE M
PONDED WATER
SOUTH LANDFILL
NORTHWEST LOBE
M7
S1
P3-5
43
42
40
41
39
O2
46
44
45
47
FEATURE A
STAINING
FEATURE A
STAINING
FEATURE B
STAINING
2m
FEATURE M
PONDED WATER
FEATURE H
DEBRIS (REMOVED)
M6
M5
36
38
37
34
35
SOUTH LANDFILL
EAST LOBE
48
P3-8
S4
P3-6
S2
33
O3
SOUTH LANDFILL
SOUTHWEST LOBE
50
31
32
2m
FEATURE G
DEBRIS
FEATURE G
EXPOSED DEBRIS
ACCESS ROAD
30
P3-7
S3
49
FEATURE F
DEBRIS
FEATURE N
EXPOSED DEBRIS
1m
0m
29
M4
FEATURE M
PONDED WATER
S7
P3-11
M3
24
J2
FEATURE I
SETTLEMENT
FEATURE I
SETTLEMENT
25
27
2
3
O1
26
28
S5
P3-9
4
5
1
FEATURE L
DEBRIS
FEATURE L
DEBRIS
8
FEATURE K
STAINING
J1
16
6
7
FEATURE K
STAINING
12
15
14
13
11
19
9
M1
10
FEATURE M
PONDED WATER
18
M2
FEATURE C
STAINING
FEATURE C
STAINING
23
22
P3-10
S6
17
20
21

LEGEND

- MONITORING SOIL SAMPLE LOCATION
- SETTLEMENT
- PONDED WATER
- STAINING
- DEBRIS
- SPARSE VEGETATION
- APPROX. PHOTOGRAPHIC VIEWPOINT (2019)
- 2015 VISUAL INSPECTION OBSERVATIONS (FOR REFERENCE)

NOTE:
RED = 2019 FEATURES
PURPLE = 2014 FEATURES

Meters
20 0 20 40
1:1000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING SOUTH LANDFILL
2019 & 2014 VISUAL INSPECTION

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE	DATE (month-year)
Meter	1 : 1,000	FEBRUARY 2020
PREPARED BY	VERIFIED BY	APPROVED BY
R. FLETCHER	R. JANZEN	C. GRAVELLE, P.ENG
PROJECT NO.	DRAWING NO.	PAGE
30000251	30000251-PIN-3.4	PL

FIGURE PIN-3.4A



Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-5 Surface - upgradient																		
05-26720	P3-5	2005	1	Phase I	0	<1	<1	<20	<5	8.1	<10	<5	<15	<0.003	<10	7.3	45	13
P3-5-1	P3-5	2007	3	Phase I	10	**1.58**	<0.5	5.7	2.9	7.1	<30	<5	9.7	<0.01	<10	<5	<5	<5
P309-5A	P3-5	2009	5	Phase I	0-15	<1	<0.1	2.0	1.0	**11.0**	<1	2.0	<10	<0.01	<12	<10	26	<10
SS11-059	P3-5	2011	7	Phase II	0-15	<2	0.1	**21.9**	3.1	**15.3**	<5	**14.0**	**19.8**	<0.45	<5	N/A	N/A	N/A
P314-5A	P3-5	2014	10	Phase II	0-15	**1.4**	0.03	5.7	3.2	**13.7**	<5	**5.4**	10.0	<0.10	<10	<50	<50	<100
P3-5A	P3-5	2019	15	Phase II	0-15	<1.0	<0.050	2.4	1.0	4.9	0.63	2.0	3.5	<0.010	<3.5	<3.0	32	<4.7
P3-5 Depth - upgradient																		
05-26722	P3-5	2005	1	Phase I	30	<1	<1	<20	<5	10.0	<10	<5	<15	<0.003	<10	5.8	<9	<8
P3-5-2	P3-5	2007	3	Phase I	50	**1.24**	<0.5	4.6	<2	8.1	<30	<5	6.7	<0.01	<10	<5	<5	<5
P309-5B	P3-5	2009	5	Phase I	40-50	<1	<0.1	2.0	1.0	**12.0**	<1	3.0	<10	<0.01	<12	<10	28	12
SS11-060	P3-5	2011	7	Phase II	40-50	<2	<0.1	15.1	1.4	9.4	<5	**8.5**	9.4	<0.45	<5	N/A	N/A	N/A
P314-5B	P3-5	2014	10	Phase II	40-50	**1.5**	0.37	5.6	3.9	**17.7**	5.8	**5.5**	12.0	<0.10	<10	<50	**53**	<100
P3-5B	P3-5	2019	15	Phase II	40-50	<1.0	0.16	3.0	1.6	**11**	1.2	4.0	8.4	<0.020	<7.0	<5.9	**140**	<9.4

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-8 surface - downgradient																		
05-26716	P3-8	2005	1	Phase I	0	**1.4**	<1	<20	<5	**13.0**	<10	**5.6**	<15	0.0053	<10	<4	**120**	**140**
P3-8-1	P3-8	2007	3	Phase I	10	**1.2**	<0.5	7.0	2.9	**20.7**	<30	**5.4**	12.3	<0.05	<10	<5	**88**	**140**
P309-8A	P3-8	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	<5	4.0	3.0	<10	<0.01	<12	<10	34	**38**
P309-8D5 (Dup)	P3-8	2009	5	Phase I	0-15	<1	<0.1	2.0	2.0	<5	4.0	2.0	<10	<0.01	<12	<10	<10	<10
SS11-057	P3-8	2011	7	Phase II	0-15	<2	0.1	**25.0**	3.3	**16.0**	**14.3**	**15.0**	**22.1**	<0.45	<5	N/A	N/A	N/A
P314-8A	P3-8	2014	10	Phase II	0-15	1.0	0.04	5.9	2.6	**10.1**	**17.5**	4.1	10.0	<0.10	<10	<50	**467**	**665**
P3-8A	P3-8	2019	15	Phase II	0-15	**2.0**	<0.050	7.7	3.5	**13**	7.5	**5.6**	11	<0.010	<3.5	2.2	42	**41**
P3-8 depth - downgradient																		
05-26718	P3-8	2005	1	Phase I	30	**1.3**	<1	<20	<5	**15.3**	<10	<5	<15	0.0031	<10	<4	**300**	**540**
P3-8-2	P3-8	2007	3	Phase I	50	0.901	<0.5	4.3	2.0	8.8	<30	<5	7.1	<0.05	<10	<5	<5	**41**
P3-21-2 (Dup)	P3-8	2007	3	Phase I	50	**1.03**	<0.5	3.8	<2	7.2	<30	<5	6.3	<0.05	<10	<5	32	**29**
P3-21-2 (Interlab)	P3-8	2007	3	Phase I	50	<10	<0.5	4.0	2.0	7.0	<5	3.0	7.0	<0.03	<5	<80	<250	**N/A**
P309-8B	P3-8	2009	5	Phase I	40-50	<1	<0.1	3.0	2.0	<5	1.0	3.0	<10	<0.01	<12	<10	27	**32**
SS11-058	P3-8	2011	7	Phase II	40-50	<2	0.1	**20.4**	3.0	**18.8**	6.2	**12.5**	**16.6**	<0.45	<5	N/A	N/A	N/A
P314-8B	P3-8	2014	10	Phase II	40-50	**1.3**	0.02	3.6	2.3	**10.8**	<5	4.2	7.0	<0.10	<10	<50	**169**	**240**
P3-8B	P3-8	2019	15	Phase II	40-50	<1.0	<0.050	3.6	1.6	5.9	2.5	3.1	5.0	<0.050	<3.5	4.1	19	12

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-9 Surface - downgradient																		
05-26730	P3-9	2005	1	Phase I	0	**1.7**	<1	<20	<5	**13.8**	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-9-1	P3-9	2007	3	Phase I	10	**1.02**	<0.5	5.2	2.3	5.7	<30	<5	7.9	<0.05	<10	<5	<5	<5
P309-9A	P3-9	2009	5	Phase I	0-15	<1	<0.1	3.0	2.0	**11.0**	3.0	4.0	<10	<0.01	<12	<10	<10	<10
SS11-062	P3-9	2011	7	Phase II	0-15	<2	<0.1	**20.2**	2.5	6.8	<5	**12.1**	12.1	<0.45	<5	N/A	N/A	N/A
P314-9A	P3-9	2014	10	Phase II	0-15	**1.1**	<0.01	6.3	2.9	8.9	<4.9	4.4	8.0	<0.10	<10	<50	<50	<100
P3-9A	P3-9	2019	15	Phase II	0-15	**1.1**	<0.050	4.1	2.2	8.2	1.5	3.8	7.1	<0.010	<3.5	**39**	43	<4.7
P3-9 Depth - downgradient																		
05-26736	P3-9	2005	1	Phase I	30	<1	<1	<20	**5.6**	**12.7**	<10	**5.3**	<15	<0.003	<10	**54**	**46**	<8
P3-9-2	P3-9	2007	3	Phase I	50	**1.15**	<0.5	4.8	2.7	**10.2**	<30	<5	8.3	<0.05	<10	**26**	40	<5
P3-22-2 (Dup)	P3-9	2007	3	Phase I	50	**1.06**	<0.5	5.8	2.9	9.4	<30	<5	8.9	<0.05	<10	**120**	**110**	6
P3-22-2 (Interlab)	P3-9	2007	3	Phase I	50	<10	<0.5	5.0	3.0	6.0	<5	4.0	9.0	<0.03	<5	<80	<250	N/A
P309-9B	P3-9	2009	5	Phase I	40-50	<1	<0.1	2.0	1.0	<5	1.0	2.0	<10	<0.01	<12	<10	<10	<10
SS11-063	P3-9	2011	7	Phase II	40-50	<2	<0.1	**61.9**	2.9	8.7	<5	**30.6**	12.4	<0.45	<5	N/A	N/A	N/A
P314-9B	P3-9	2014	10	Phase II	40-50	0.8	<0.01	4.3	2.3	6.4	<4.9	3.2	6.0	<0.10	<10	**230**	**158**	<100
P3-9B	P3-9	2019	15	Phase II	40-50	**1.2**	<0.050	4.1	2.4	10	1.6	3.4	7.2	<0.010	<3.5	**14**	20	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-6 surface - downgradient																		
05-26724	P3-6	2005	1	Phase I	0	1.0	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-6-1	P3-6	2007	3	Phase I	10	0.491	<0.5	3.2	<2	**124.0**	<30	**9.1**	6.1	<0.01	<10	**13**	**120**	**130**
P309-6A	P3-6	2009	5	Phase I	0-15	<1	<0.1	1.0	<1	<5	<1	1.0	<10	<0.01	<12	**11**	19	<10
SS11-054	P3-6	2011	7	Phase II	0-15	<2	<0.1	<5	1.1	2.6	<5	3.2	8.7	<0.45	<5	N/A	N/A	N/A
P314-6A	P3-6	2014	10	Phase II	0-15	0.9	0.01	3.3	1.9	4.6	<5	3.1	5.0	<0.10	<10	<50	<50	<100
P3-6A	P3-6	2019	15	Phase II	0-15	<1.0	<0.050	2.1	0.91	2.8	0.68	1.7	3.3	<0.010	<3.5	<3.0	<6.4	<4.7
P3-6 depth - downgradient																		
05-26726	P3-6	2005	1	Phase I	30	**1.4**	<1	<20	<5	**16.0**	<10	<5	<15	<0.003	<10	8	10	<8
P3-6-2	P3-6	2007	3	Phase I	50	**1.36**	<0.5	5.5	2.6	7.5	<30	<5	8.3	<0.01	<10	<5	<5	<5
P309-6B	P3-6	2009	5	Phase I	40-50	<1	<0.1	3.0	1.0	7.0	<1	3.0	<10	<0.01	<12	<10	15	<10
SS11-056	P3-6	2011	7	Phase II	40-50	<2	0.1	**27.2**	2.4	**10.1**	<5	**14.9**	**15.9**	<0.45	<5	N/A	N/A	N/A
P314-6B	P3-6	2014	10	Phase II	40-50	**1.2**	0.07	4.5	3.5	**12.9**	<5	5.0	7.0	<0.10	<10	<50	<50	<100
P314-6D3 (Dup)	P3-6	2014	10	Phase II	40-50	**2.2**	0.03	3.2	2.4	**12.8**	<5	3.5	5.0	<0.10	<10	<50	<50	<100
P314-6B (Interlab)	P3-6	2014	10	Phase II	40-50	1.0	<0.1	**57.0**	2.2	7.4	1.1	**27.0**	<10	<0.01	<12	<10	<50	N/A
P3-6B	P3-6	2019	15	Phase II	40-50	<1.0	<0.050	2.5	0.97	9.0	0.70	1.9	4.2	<0.010	<3.5	<3.0	13	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-7 surface - downgradient																		
05-26712	P3-7	2005	1	Phase I	0	**1.2**	<1	<20	<5	**14.1**	<10	**5.7**	**15.7**	<0.003	<10	4.7	<9	<8
P3-7-1	P3-7	2007	3	Phase I	10	**1.54**	<0.5	6.9	3.0	**14.6**	<30	**5.1**	12.0	<0.05	<10	<5	<5	<5
P309-7A	P3-7	2009	5	Phase I	0-15	**2.0**	<0.1	**42.0**	3.0	8.0	4.0	**21.0**	<10	<0.01	<12	<10	17	<10
SS11-052	P3-7	2011	7	Phase II	0-15	**2.2**	0.1	**40.1**	4.6	**20.8**	<5	**22.9**	**18.5**	<0.45	<5	N/A	N/A	N/A
P314-7A	P3-7	2014	10	Phase II	0-15	**1.3**	0.03	4.8	3.4	**12.1**	<4.9	5.0	8.0	<0.10	<10	<50	**53**	<100
P3-7A	P3-7	2019	15	Phase II	0-15	**3.7**	<0.050	7.4	3.2	**14**	4.8	**6.1**	11	<0.010	<3.5	<2.0	12	<3.9
P3-7 depth - downgradient																		
05-26714	P3-7	2005	1	Phase I	30	**1.9**	<1	<20	<5	**12.2**	<10	**6.4**	**16.9**	<0.003	<10	4	<9	10
P3-7-2	P3-7	2007	3	Phase I	50	**1.01**	<0.5	6.2	2.5	9.4	<30	<5	9.4	<0.05	10	**14**	<5	<5
P309-7B	P3-7	2009	5	Phase I	40-50	1.0	<0.1	**27.0**	2.0	8.0	8.0	**13.0**	<10	<0.01	<12	<10	<10	<10
SS11-053	P3-7	2011	7	Phase II	40-50	**2.9**	0.1	**50.7**	4.4	**11.4**	<5	**26.9**	**17.1**	<0.45	<5	N/A	N/A	N/A
P314-7B	P3-7	2014	10	Phase II	40-50	0.5	<0.01	3.1	1.6	**17.4**	<5	2.7	4.0	<0.10	<10	<50	<50	<100
P3-7B	P3-7	2019	15	Phase II	40-50	**2.6**	0.091	6.6	2.9	**13**	6.2	**5.3**	12	<0.050	<3.5	2.2	14	<3.9

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-11 surface - downgradient																		
05-26728	P3-11	2005	1	Phase I	0	**1.3**	<1	<20	<5	7.0	<10	<5	<15	<0.003	<30	8.7	14	<8
P3-11-1	P3-11	2007	3	Phase I	10	0.222	<0.5	3.9	<2	7.0	<30	<5	7.9	<0.05	<15	8	**210**	**250**
P309-11A	P3-11	2009	3	Phase I	0-15	<1	<0.1	2.0	1.0	<5	<1	3.0	<10	<0.02	<12	<10	<10	<10
SS11-067	P3-11	2011	5	Phase I	0-15	**2.8**	0.9	**28.0**	1.8	**11.0**	<5	**16.3**	**20.2**	<0.45	<5	N/A	N/A	N/A
SS11-068 (Dup)	P3-11	2011	5	Phase I	0-15	**4.7**	**1.4**	**28.9**	2.2	**18.5**	<5	**18.5**	**21.7**	<0.45	<5	N/A	N/A	N/A
P314-11A	P3-11	2014	10	Phase II	0-15	0.7	0.07	4.3	2.1	7.1	<5	3.3	6.0	<0.10	<10	<50	<50	<100
P3-11A	P3-11	2019	15	Phase II	0-15	<1.0	<0.050	3.1	1.6	7.0	0.81	2.9	4.6	<0.050	<6.6	6.6	**200**	**26**
P3-11 depth - downgradient																		
Not sampled	P3-11	2005	1	Phase I														
P3-11-2	P3-11	2007	1	Phase I	50	0.912	<0.5	5.2	2.4	**12.5**	<30	<5	9.0	<0.05	<10	<5	35	17
P309-11B	P3-11	2009	3	Phase I	40-50	1.0	<0.1	**48.0**	**6.0**	**39.0**	1.0	**32.0**	<10	<0.01	<12	<10	<10	<10
SS11-069	P3-11	2011	5	Phase I	40-50	**2.2**	0.1	**22.1**	2.6	**17.5**	<5	**13.3**	**15.3**	<0.45	<5	N/A	N/A	N/A
SS11-070 (Dup)	P3-11	2011	7	Phase II	40-50	<2	0.1	**26.0**	2.8	9.7	<5	**15.2**	**16.6**	<0.45	<5	N/A	N/A	N/A
P314-11B	P3-11	2014	10	Phase II	40-50	**2.2**	<0.01	6.4	4.0	**16.3**	<4.9	**6.3**	12.0	<0.10	<10	<50	<50	<100
P3-11B	P3-11	2019	15	Phase II	40-50	**1.4**	<0.050	6.2	2.7	**16.0**	2.2	**5.1**	7.9	<0.050	<3.5	3.8	12	<4.7
P3-19B (Dup)	P3-11	2019	15	Phase II	40-50	**1.8**	<0.050	5.8	2.5	**13.0**	2.1	4.8	7.3	<0.050	<3.5	<3.0	<6.4	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
P3-10 surface - downgradient																		
05-26732	P3-10	2005	1	Phase I	0	<1	<1	<20	<5	7.4	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-10-1	P3-10	2007	3	Phase I	10	0.838	<0.5	4.4	2.1	**11.2**	<30	<5	8.6	<0.05	<10	<5	<5	**35**
P309-10A	P3-10	2009	5	Phase I	0-15	<1	<0.1	2.0	1.0	<5	1.0	3.0	<10	<0.01	<12	<10	<10	<10
SS11-064	P3-10	2011	7	Phase II	0-15	<2	<0.1	11.3	1.7	5.7	<5	**7.1**	12.2	<0.45	<5	N/A	N/A	N/A
P314-10A	P3-10	2014	10	Phase II	0-15	0.7	<0.01	3.0	1.6	7.3	<5	2.4	5.0	<0.10	<10	<50	<50	<100
P3-10A	P3-10	2019	15	Phase II	0-15	<1.0	<0.050	4.4	2.0	**11.0**	1.3	3.6	9.0	<0.010	<3.5	<2.0	10	<3.9
P3-10 depth - downgradient																		
05-26734	P3-10	2005	1	Phase I	30	<1	<1	<20	<5	5.9	<10	<5	<15	<0.003	<10	4.3	<9	<8
P3-10-2	P3-10	2007	3	Phase I	50	**1.24**	<0.5	8.1	3.2	**15.1**	<30	**5.9**	10.1	<0.05	<10	<5	<5	7
P309-10B	P3-10	2009	5	Phase I	40-50	1.0	<0.1	2.0	1.0	6.0	1.0	2.0	<10	<0.01	<12	<10	<10	<10
SS11-066	P3-10	2011	7	Phase II	40-50	<2	0.1	18.6	1.9	7.0	<5	**10.4**	11.9	<0.45	<5	N/A	N/A	N/A
P314-10B	P3-10	2014	10	Phase II	40-50	1.0	<0.01	4.4	2.7	**21.8**	<4.9	3.8	7.0	<0.10	<10	<50	<50	<100
P3-10B	P3-10	2019	15	Phase II	40-50	<1.0	<0.050	2.8	1.3	5.3	0.95	2.5	4.4	<0.010	<3.5	2.3	17	<3.9

PIN-3 South Landfill	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation	0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean +3 x Standard Deviation	**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						200			1				
DEW Line Cleanup Tier II Criteria	30	5	250	50	100	500	100	500	5				

LEGEND

- MONITORING SOIL SAMPLE LOCATION

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean +3 x SD
N/A	not analyzed

Meters
20 0 20 40
1:1000

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

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Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING SOUTH LANDFILL
2019 SOIL ANALYTICAL RESULTS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	FEBRUARY 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: R. JANZEN	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-PIN-3.4	PAGE PL

FIGURE PIN-3.4B

6 PIN-3: NORTH LANDFILL

6.1 Landfill Description

The North Landfill is located approximately 650 metres north of the main station area. The surrounding area is greatly disturbed due to borrow recovery activities (aggregate materials) during the site decommissioning and remediation. The construction of this landfill included the consolidation of surface debris, regrading of the existing ground surface and capping of the landfill with site derived granular fill to act as the landfill cover.

The long-term monitoring plan for the North Landfill consists of visual inspection and the periodic collection of soil samples to monitor for the presence of leachate. The landfill layout, visual observations and photographic locations are presented on **Figure PIN-3.5A** located at the end of this landfill section.

6.2 Summary of Work Conducted

6.2.1 Visual Inspection

A visual inspection was completed at the North Landfill on 18 August 2019. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

6.2.2 Soil Sampling

Soil sampling at the North Landfill was conducted on August 18, 2019 and consisted of the collection of ten soil samples from five soil sample stations (P3-12, P3-13, P3-14, P3-15, and P3-16). Two blind field duplicate samples P3-17A and P3-18A were collected at surface from stations P3-13 and P3-16 respectively. Depth limitations were encountered at the following soil sampling stations:

- Station P3-12, where refusal on bedrock limited the depth sample from 0.25 to 0.33 mbgs;
- Station P3-13, where refusal on bedrock limited the depth of sample from 0.15 to 0.2 mbgs;
- Station P3-14, where refusal on bedrock limited the depth of sample from 0.15 to 0.2 mbgs;
- Station P3-15, where refusal on bedrock limited the depth of sample from 0.25 to 0.35 mbgs; and,
- Station P3-16, where refusal on bedrock limited the depth of sample from 0.25 to 0.35 mbgs.

The following table outlines the soil sampling activities conducted at the North Landfill.

Table 6-1: Summary of Work Conducted by Soil Sampling Location- North Landfill

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
P3-12 (upgradient)	P3-12A	0 - 0.15	Sand and organics, some gravel, few cobbles, rootlets, brown, dry
	P3-12B	0.25 – 0.33	Sand and gravel, some cobble, trace organics, greyish brown, dry, refusal on bedrock

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
P3-13 (downgradient)	P3-13A	0 - 0.15	Sand and organics, some gravel and cobble, brown, rootlets, dry
	P3-13B	0.15 – 0.2	Cobble, some gravel and sand, trace organics, rootlets, greyish brown, dry, refusal at bedrock
P3-14 (downgradient)	P3-14A	0 - 0.15	Sand and organics, some gravel and cobble, rootlets, brown, dry
	P3-14B	0.15 – 0.2	Cobble, some gravel and sand, trace organics, rootlets, greyish brown, dry, refusal at bedrock
P3-15 (downgradient)	P3-15A	0 - 0.15	Sand and gravel, some brown organics, rootlets, greyish brown, dry
	P3-15B	0.25 – 0.35	Sand and gravel, some cobble, greyish brown, rootlets, dry, refusal on bedrock
P3-16 (downgradient)	P3-16A	0 – 0.15	Cobble and gravel, some sand and organics, rootlets, brown, dry
	P3-16B	0.25 – 0.35	Cobble and gravel, some sand, trace organics, greyish brown, dry, refusal on bedrock

6.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the North Landfill; therefore, no groundwater sampling or analysis was conducted as part of the 2019 monitoring program.

6.2.4 Thermal Monitoring

No thermistors are present at the North Landfill; therefore, no thermal monitoring was conducted as part of the 2019 monitoring program.

6.3 Results of the Monitoring Program

The following Sections 6.3.1 through 6.3.3 summarize the results of the PIN-3 monitoring program at the North Landfill.

6.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 6.3.1.1 through 6.3.1.5. **Figure PIN-3.5A** presents the visual inspection findings and photographic locations.

6.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR and the visual inspection checklist is included below.

Table 6-2: Visual Inspection Checklist – North Landfill

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: North Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 18 August 2019 WEATHER CONDITIONS: Overcast and breezy, with intermittent rain.
DATE OF PREVIOUS INSPECTION: 18 August 2014
INSPECTED BY: Ryan Janzen
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.**

Table 6-2: Visual Inspection Checklist – North Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Y	A	NW slope of E lobe.	7598713.211, 408625.204	12 North	5.8	0.2	0.1	<1%	Minor depression, linear.	Longer than previously noted.	Acceptable.	NLF_6, 7
Settlement	Y	B	SW corner of W lobe.	7598675.397, 408501.924	12 North	0.7	0.6	0.15	<1%	Minor depression.	Consistent.	Acceptable.	NLF_19
Erosion	Y	C	S slope of W lobe, toe to crest.	7598684.340, 408513.764	12 North	4.5	0.1	0.05	<1%	Minor erosion.	Longer than previously noted.	Acceptable.	NLF_16
Lateral Movement	N												
Frost Action	N												
Sloughing	N												
Cracking	N												
Animal Burrows	N												
Vegetation Establishment	Y	E1	SW corner of E lobe.	7598691.733, 408630.638		92.5m^2		~2%		Smaller than previously noted.		NLF_3
		E2	NW slope of W lobe.	7598710.163, 408512.761	12 North	105m^2	NA	~2%	Sparse vegetation.	Larger than previously noted.	Acceptable.	NLF_26
		E3	N point of W lobe.	7598732.588, 408541.695		134m^2		<1%		NEW OBSERVATION.		NLF_22, 23
Staining	N											
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	N											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Y	D	SW area of W lobe.	7598687.203, 408512.696	12 North	19.5	0.2	0.15	<1%	Equipment ruts, potential construction relic.	Consistent.	Acceptable.	NLF_20, 21

6.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the North Landfill was conducted on 18 August 2019 as per the TOR and the results are provided below.

Table 6-3: Preliminary Stability Assessment – North Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Occasional
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

6.3.1.3 Photographic Records

The detailed photographic record for the North Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the separately appended CD/DVD-ROM. **Figure PIN-3.5A** illustrates the photograph locations and directions.

6.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the North Landfill. The following table outlines the results of the visual trend analysis. Features where no significant change was observed have not been listed here.

Table 6-4: Visual Inspection Trends – North Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A	Observed length has increased from 3.0 m in 2014 to 5.8 m in 2019.
Erosion	C	Observed length has increased from 3.0 m in 2014 to 4.5 m in 2019.
Vegetation Establishment	E1	Coverage appears to have decreased since 2014 (no measurements given previously).
	E2	Coverage appears to have expanded since 2014 (no measurements given previously).
	E3	New observation.

6.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2019 monitoring events at the North Landfill indicates that a couple of observed features, both settlement (Feature A) and erosion (Feature C) types, have increased slightly in size. Vegetated areas appear to be expanding, with the exception of Feature E1; though there were no dimensions given from the 2014 program, a comparison of observed areas against previous figures indicates larger vegetated areas in 2019. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

6.3.2 Soil Sampling

Soil sampling of the North Landfill was conducted on August 18, 2019. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR and details are provided below in the following sections.

6.3.2.1 Laboratory Analytical Results

A total of 12 soil samples (including two field duplicates) were collected from five soil sample locations at North Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 4** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-3.5B** presents a summary of significant soil analytical results and is located at the end of this landfill section.

6.3.2.2 Summary of Soil Results

The soil results for 2019 are presented in the following table. The background and baseline mean are presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 6-5: Evaluation of Results by Parameter – North Landfill

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Arsenic (As)	1.0	1.2	**3.4**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cadmium (Cd)	1.0	1.0	**1.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Chromium (Cr)	20.0	20.0	**20.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	5.0	5.0	**5.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Copper (Cu)	12.6	9.9	**46.6**	The downgradient sample from P3-13 at depth exceeded the BL+3SD at 67 mg/kg. In addition, the downgradient sample from P3-15 at surface exceeded the BL+3SD at 49 mg/kg. All upgradient and remaining downgradient results were below the BL+3SD. It should be noted that the landfill has a maximum baseline copper concentration of 77 mg/kg.
Lead (Pb)	10.0	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Nickel (Ni)	6.7	5.0	**5.0**	Downgradient samples from P3-16 at surface and depth exceeded the BL+3SD at 7.6 and 6.8 mg/kg respectively. In addition, sample P3-18A (the duplicate sample of the surface sample from P3-16) exceeded the BL+3SD at 6.1 mg/kg. However, all these exceedances were within 3 times the baseline mean. All upgradient and remaining downgradient results were below the BL+3SD.
Zinc (Zn)	16.4	15.0	**15.0**	All soil sample results were equal to or below the BL+3SD at upgradient and downgradient locations.
PCBs (Total)	0.1	0.1	**0.1**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F1 (C_6-C_{10})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
F2 (C_{10}-C_{16})	N/A	10.0	**10.0**	The downgradient sample from P3-16 at surface exceeded the BL+3SD at 23 mg/kg. All upgradient and remaining downgradient results were below the BL+3SD.
F3 (C_{16}-C_{34})	N/A	16.7	**50.2**	The downgradient sample from P3-14 at depth exceeded the BL+3SD at 52 mg/kg. In addition, the downgradient primary and duplicate sample from P3-16 at surface exceeded the BL+3SD at 100 mg/kg and 55 mg/kg (sample P3-18A) respectively. All upgradient and remaining downgradient results were below the BL+3SD.
F4 (C_{34}-C_{50})	N/A	16.6	**56.1**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

6.3.2.3 Discussion of Soil Results and Trends

Upgradient soil samples at surface and depth were below the BL+3SD for all parameters.

Downgradient soil results above the BL+3SD for copper, nickel, PHC F2 and PHC F3 were reported at the North Landfill in 2019.These exceedances are discussed further below.

Concentrations of copper slightly exceeding the BL+3SD of 46.6 mg/kg were detected at two sample stations (P3-13 and P3-15) at the North Landfill in 2019. These exceedances ranged between 49 and 67 mg/kg were the highest copper concentrations detected at these two sample stations to date. However, both exceedances were less than the maximum baseline copper concentration of 77 mg/kg reported in 2000. Given that 2019 represents the first monitoring event in which copper exceedances have been detected at the North Landfill, additional data points are required to determine if these exceedances are an indication of contaminant migration from the landfill or simply represent natural variation in downgradient copper concentrations.

Exceedances of nickel were detected at a single downgradient station (P3-16) at the North Landfill in both the primary and duplicate samples. These exceedances were within 3 times the baseline mean and are likely due to variability in the baseline levels given that the baseline mean for nickel was set to the analytical detection limit and no standard deviation was calculated. It is also worth noting that the maximum background concentration detected in 1990 for Nickel at the PIN-3 site was 17.9 mg/kg while the highest nickel exceedance detected at the North landfill in 2019 was 7.6 mg/kg.

An exceedance of PHC F2 and F3 was also identified at downgradient station P3-16. In addition, an exceedance of PHC F3 was detected at downgradient station P3-14. Based on the organic material (peat) observed at both stations and a review of the sample's PHC F2 and F3b concentrations, these PHC exceedances detected are likely due in part to natural biogenic organic compounds. It should also be noted that the action level for PHC remediation at DEW Line sites is typically 2,500 mg/kg; therefore, detectible hydrocarbon contamination below this concentration is not uncommon in the vicinity of the landfills.

Accordingly, these PHC F2 and F3 exceedances are therefore not suspected to be an indication of contaminant migration from the landfill.

As seven sampling events worth of soil data has yet to be collected, a trend evaluation has not been completed as part of the 2019 monitoring program. The performance of the landfill should be re-evaluated once seven sampling events worth of data are available. Copper results should be examined in the next monitoring event to determine if concentrations are increasing at downgradient soil sampling stations.

6.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the North Landfill; therefore, no groundwater sampling or analysis was conducted as part of the 2019 monitoring program.

6.3.4 Thermal Monitoring

No thermistors are present at the North Landfill; therefore, no thermal monitoring was conducted as part of the 2019 monitoring program.

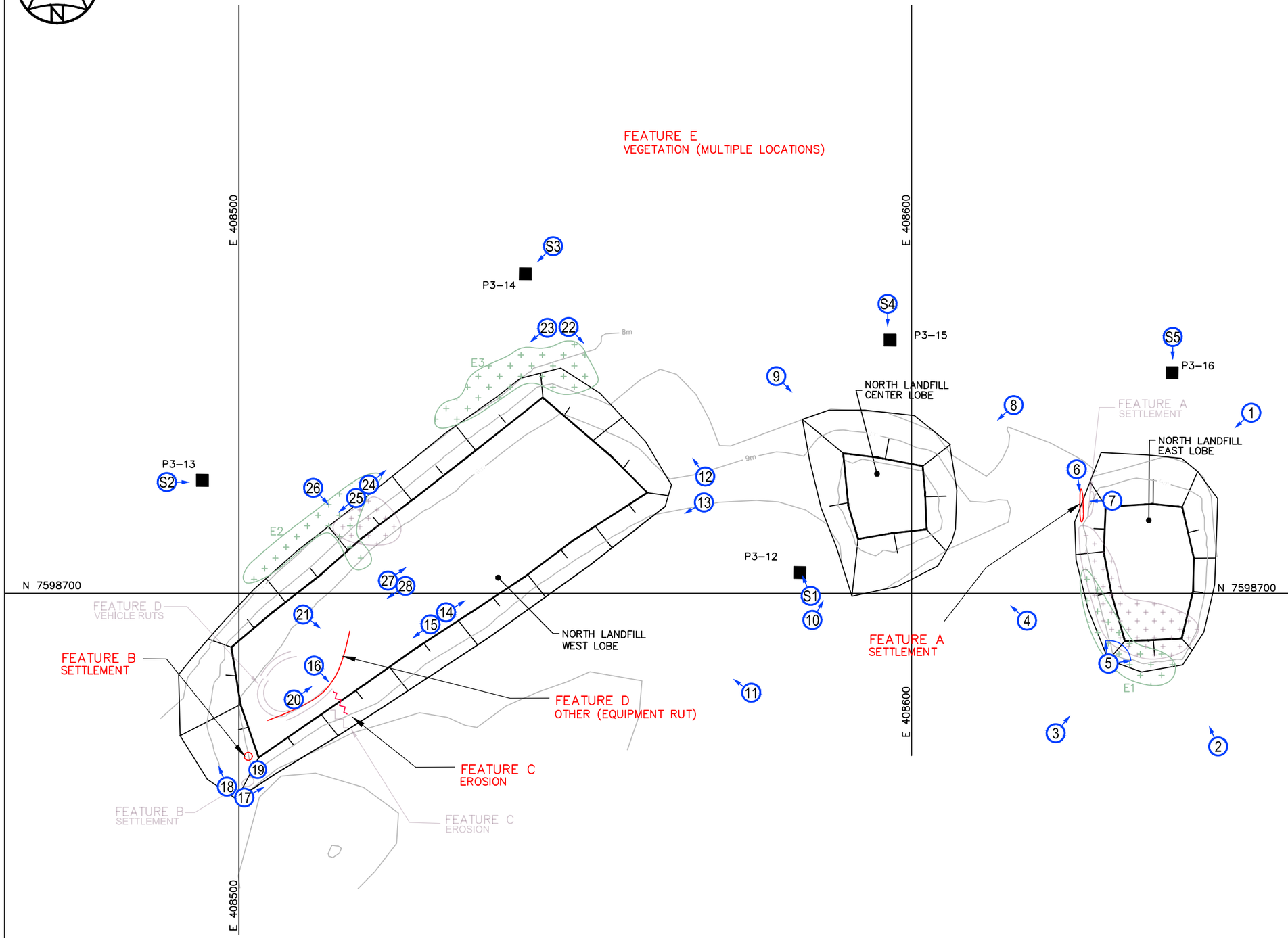
6.4 Overall Landfill Performance, Conclusions and Recommendations

As the 2019 monitoring program is only the sixth monitoring program to have been conducted at the North Landfill, trends in soil concentrations were not evaluated. However, based on the limited chemical data collected to date and observations made during the 2019 field program, the landfill appears to be performing as intended with no apparent indications of contaminant migration.

Based on this review, it is recommended to continue the long-term monitoring of soils as planned and the performance of the landfill be re-evaluated once the results of seven monitoring events are available. In addition, copper results should be closely examined in the next monitoring event to determine if concentrations are increasing at downgradient soil sampling stations.

Based on the results of the visual inspection, the North Landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

Based on the results of the 2019 monitoring program, the overall performance of the North Landfill is acceptable.



LEGEND

- TBM11 — TEMPORARY BENCHMARK
- MONITORING SOIL SAMPLE LOCATION
- SETTLEMENT
- STAINING
- SPARSE VEGETATION
- EROSION
- OTHER (EQUIPMENT RUT)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2019)
- 2014 VISUAL INSPECTION OBSERVATIONS (FOR REFERENCE)

NOTE:
RED = 2019 FEATURES
PURPLE = 2014 FEATURES

Meters
10 0 10 20
1:600

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

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COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING NORTH LANDFILL
2019 & 2014 VISUAL INSPECTION

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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 600	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
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PROJECT NO.:	DRAWING NO.:	PAGE:
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FIGURE PIN-3.5A

PIN-3 North Landfill

	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**1.2**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**16.7**	**16.6**
Baseline Data - Standard Deviation	0.7	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.00	0.0	0.0	11.2	13.2
Baseline Data Mean + 3x Standard Deviation	**3.4**	**1.0**	**20.0**	**5.0**	**46.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.2**	**56.1**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P3-14 surface - downgradient																	
05-26710	P3-14	2005	1	Phase I	0	**1.4**	<1	<20	<5	<5	<10	<5	<15	0.0034	<10	4.1	**18**	**18**
P3-14-1	P3-14	2007	3	Phase I	10	0.768	<0.5	3.2	<2	3.7	<30	<5	8.1	<0.05	<10	<5	**31**	**59**
P309-14A	P3-14	2009	5	Phase I	0-15	**2.0**	<0.1	3.0	1.0	<5	2.0	3.0	<10	<0.01	<12	<10	**26**	<10
SS11-005	P3-14	2011	7	Phase II	0-15	<2	0.2	6.7	<1	3.5	<5	**5.8**	12.9	<0.45	<5	N/A	N/A	N/A
P314-14A	P3-14	2014	10	Phase II	0-15	1.0	0.02	3.8	1.4	3.0	<5	2.1	7.0	<0.10	<10	<50	<50	<100
P314-BD5 (D	P3-14	2014	10	Phase II	0-15	0.9	0.02	3.3	1.2	2.7	<5	1.6	6.0	<0.10	<10	<50	<50	<100
P314-14A (Int	P3-14	2014	10	Phase II	0-15	**1.2**	<0.1	18.0	1.1	8.7	2.2	**8.8**	<10	<0.01	<12	<10	<50	N/A
P3-14A	P3-14	2019	15	Phase II	0-15	<1.0	<0.050	4.0	1.2	6.3	1.8	2.5	9.2	<0.010	<3.5	3.3	**37**	8.8
	P3-14 depth - downgradient																	
Not sampled	P3-14	2005	1	Phase I														
P3-14-2	P3-14	2007	3	Phase I	30	**2.85**	<0.5	3.2	<2	3.9	<30	<5	7.2	<0.05	<10	7	**52**	**51**
Not sampled	P3-14	2009	5	Phase I														
SS11-006	P3-14	2011	7	Phase II	30-50	<2	<0.1	6.9	<1	2.9	<5	**6.5**	9.7	<0.45	<5	N/A	N/A	N/A
Not sampled	P3-14	2014	10	Phase II														
P3-14B	P3-14	2019	15	Phase II	15-20	1.0	<0.050	4.6	1.1	8.8	1.8	2.7	8.5	<0.010	<3.5	3	**52**	15

P3–14

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P3-16 surface - downgradient																	
05-26698	P3-16	2005	1	Phase I	0	**2.2**	<1	<20	<5	**10.6**	<10	**7.0**	<15	<0.003	<10	7	**27**	**31**
P3-16-1	P3-16	2007	3	Phase I	10	**1.73**	<0.5	3.9	<2	8.4	<30	**6.4**	7.9	<0.05	<10	<5	**78**	**100**
P309-16A	P3-16	2009	5	Phase I	0-15	**2.0**	<0.1	2.0	1.0	6.0	2.0	**6.0**	<10	<0.01	<12	<10	**34**	12
P309-BD3 (D	P3-16	2009	5	Phase I	0-15	**2.0**	<0.1	3.0	1.0	6.0	3.0	**7.0**	<10	<0.01	<12	<10	**26**	10
SS11-007	P3-16	2011	7	Phase II	0-15	<2	<0.1	6.6	1.1	8.0	<5	**10.7**	7.7	<0.45	<5	N/A	N/A	N/A
P314-16A	P3-16	2014	10	Phase II	0-15	**1.8**	0.04	5.6	2.1	**17.6**	<4.9	**9.9**	9.0	<0.10	<10	<50	<50	<100
P3-16A	P3-16	2019	15	Phase II	0-15	**2.9**	<0.050	3.7	1.6	**13.0**	4.8	**7.6**	8.0	<0.010	<3.5	**23**	**100**	**23**
P3-18A	P3-16	2019	15	Phase II	0-15	**2.2**	<0.050	3.1	1.5	**11**	4.0	**6.1**	7.4	<0.010	<3.5	9.2	**55**	11
	P3-16 depth - downgradient																	
Not sampled	P3-16	2005	1	Phase I														
P3-16-2	P3-16	2007	3	Phase I	40	**2.12**	<0.5	3.7	<2	6.9	<30	**5.2**	6.5	<0.05	<10	7	**44**	**50**
P309-16B	P3-16	2009	5	Phase I	15-25	**2.0**	<0.1	2.0	1.0	<5	3.0	5.0	<10	<0.01	<12	**13**	**31**	11
SS11-008	P3-16	2011	7	Phase II	40-50	<2	<0.1	15.0	1.5	3.2	<5	**11.1**	10.1	<0.45	<5	N/A	N/A	N/A
SS11-009 (Int	P3-16	2011	7	Phase II	40-50	<1	<0.1	5.0	2.0	<5	2.0	4.0	<10	<0.01	<12	<10	<10	<10
P314-16B	P3-16	2014	10	Phase II	20-30	**2.6**	0.02	3.6	2.3	6.4	5.3	**6.5**	5.0	<0.10	<10	<50	<50	<100
P3-16B	P3-16	2017	15	Phase II	25-35	**1.9**	<0.050	3.4	1.3	**16**	3.2	**6.8**	8.0	<0.010	<3.5	5.5	**42**	7.7

P3–16

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P3-15 surface - downgradient																	
05-26704	P3-15	2005	1	Phase I	0	**2.3**	<1	<20	<5	7.3	<10	<5	**15.2**	<0.003	<10	5.3	**31**	**38**
P3-15-1	P3-15	2007	3	Phase I	10	1.05	<0.5	4.5	<2	9.3	<30	<5	11.3	<0.05	<10	<5	**61**	**87**
P309-15A	P3-15	2009	5	Phase I	0-15	1.0	<0.1	3.0	1.0	<5	2.0	3.0	<10	<0.01	<12	<10	**34**	12
SS11-010	P3-15	2011	7	Phase II	0-15	<2	<0.1	10.6	1.1	2.8	<5	**8.5**	11.4	<0.45	<5	N/A	N/A	N/A
P314-15A	P3-15	2014	10	Phase II	0-15	**1.3**	0.04	4.1	2.3	7.0	<5	3.9	11.0	<0.10	<10	<50	<50	<100
P3-15A	P3-15	2019	15	Phase II	0-15	1.0	<0.050	3.4	1.2	**49**	1.9	2.8	15	<0.010	<3.5	<3.0	**46**	<4.7
	P3-15 depth - downgradient																	
Not sampled	P3-15	2005	1	Phase I														
P3-15-2	P3-15	2007	3	Phase I	20	**1.79**	<0.5	4.1	<2	4.6	<30	<5	9.0	<0.05	<10	<5	**44**	**50**
P309-15B	P3-15	2009	5	Phase I	20-30	**3.0**	<0.1	3.0	1.0	<5	3.0	3.0	<10	<0.01	<12	<10	**33**	11
SS11-011	P3-15	2011	7	Phase II	40-50	<2	<0.1	8.2	1.2	2.5	<5	**7.7**	10.9	<0.45	<5	N/A	N/A	N/A
P314-15B	P3-15	2014	10	Phase II	20-30	0.6	<0.01	4.0	1.5	4.7	<4.9	2.3	4.0	<0.10	<10	<50	<50	<100
P3-15B	P3-15	2019	15	Phase II	25-35	**1.7**	<0.050	3.7	1.2	6.9	2.6	2.3	6.5	<0.010	<3.5	6	**35**	10

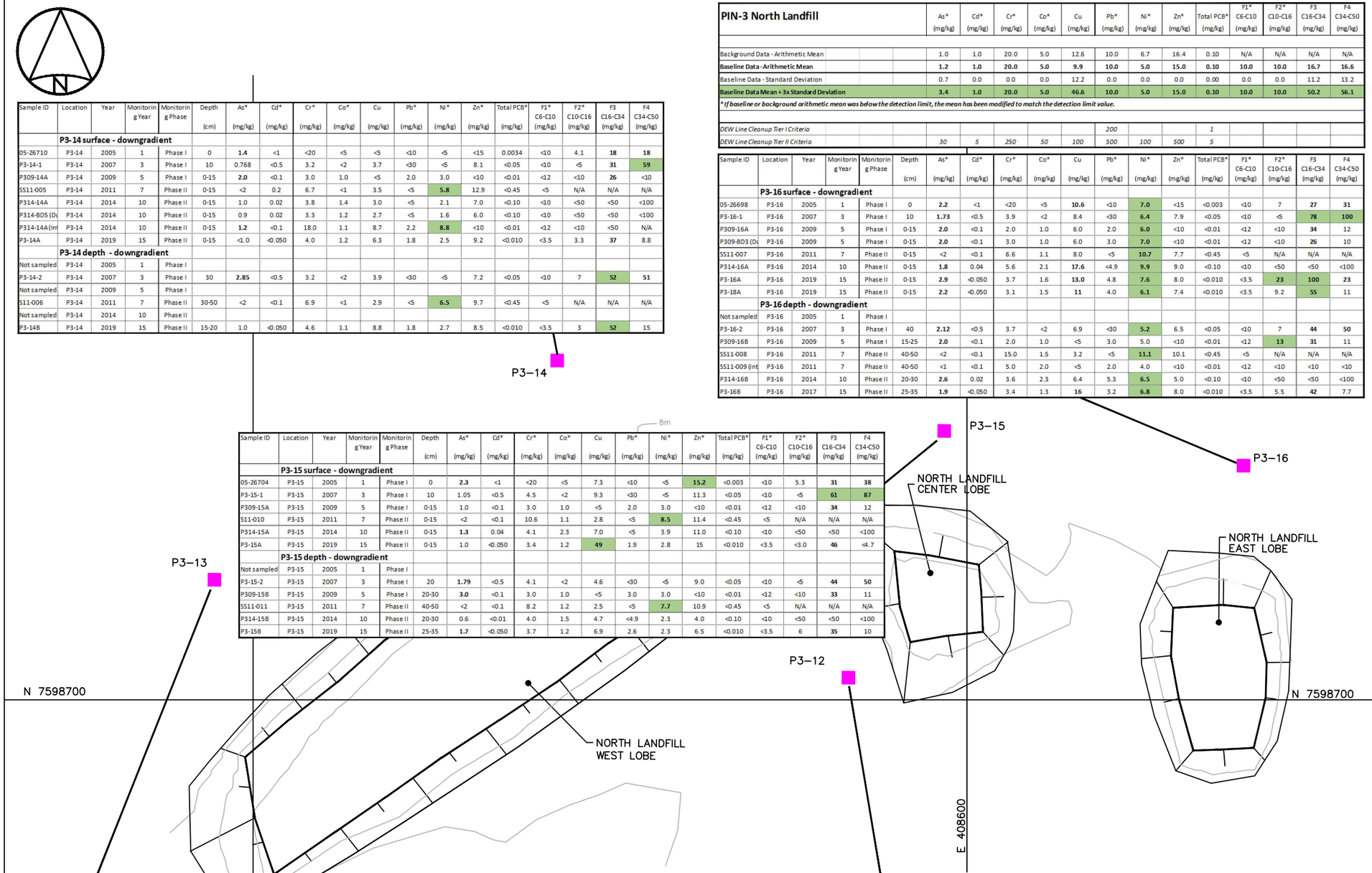
P3–15

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P3-13 surface - downgradient																	
05-26708	P3-13	2005	1	Phase I	0	**1.6**	<1	<20	<5	5.3	<10	<5	**16.6**	0.0039	<10	<4	**51**	**44**
P3-13-1	P3-13	2007	3	Phase I	10	1.08	<0.5	3.9	<2	4.6	<30	<5	13.4	<0.05	<10	<5	**140**	**200**
P309-13A	P3-13	2009	5	Phase I	0-15	<1	<0.1	2.0	<1	<5	2.0	2.0	<10	<0.01	<12	<10	**31**	12
SS11-003	P3-13	2011	7	Phase II	0-15	<2	<0.1	14.1	<1	<2	<5	**9.4**	7.3	<0.45	<5	N/A	N/A	N/A
P314-13A	P3-13	2014	10	Phase II	0-15	**1.2**	0.06	3.8	1.4	4.7	<5	2.5	**16.0**	<0.10	<10	<50	<50	<100
P3-13A	P3-13	2019	15	Phase II	0-15	**1.2**	<0.050	2.7	0.94	2.9	1.9	2.1	6.1	<0.010	<3.5	4	**39**	9
P3-17A	P3-13	2019	15	Phase II	0-15	**1.2**	<0.050	2.7	0.95	3.4	2.4	3.0	5.5	<0.010	<3.5	3.2	**46**	8.9
	P3-13 depth - downgradient																	
Not sampled	P3-13	2005	1	Phase I														
P3-13-2	P3-13	2007	3	Phase I	40	**1.83**	<0.5	3.4	<2	3.3	<30	<5	7.1	<0.05	<10	<5	**59**	**73**
P309-13B	P3-13	2009	5	Phase I	15-25	**2.0**	<0.1	2.0	<1	<5	3.0	2.0	<10	<0.01	<12	<10	**46**	15
SS11-004	P3-13	2011	7	Phase II	40-50	<2	<0.1	14.4	<1	<2	<5	**11.2**	7.4	<0.45	<5	N/A	N/A	N/A
Not sampled	P3-13	2014	10	Phase II														
P3-13B	P3-13	2019	15	Phase II	15-20	**1.2**	<0.050	2.6	1.1	**67**	1.9	2.2	6.8	<0.010	<3.5	<2.0	15	<3.9

P3–13

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P3-12 surface - upgradient																	
05-26706	P3-12	2005	1	Phase I	0	**1.5**	<1	<20	<5	6.2	<10	<5	<15	0.0043	<10	<4	14	<8
P3-12-1	P3-12	2007	3	Phase I	10	**1.46**	<0.5	3.4	<2	**13.3**	<30	<5	**34.5**	<0.05	<10	<5	**51**	**30**
P309-12A	P3-12	2009	5	Phase I	0-15	<1	<0.1	3.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	10	<10
SS11-001	P3-12	2011	7	Phase II	0-15	<2	<0.1	7.8	1.8	4.0	<5	**6.4**	12.6	<0.45	<5	N/A	N/A	N/A
P314-12A	P3-12	2014	10	Phase II	0-15	0.9	0.03	3.9	1.7	7.0	<4.9	3.1	12.0	<0.10	<10	<50	<50	<100
P3-12A	P3-12	2019	15	Phase II	0-15	<1.0	<0.050	4.2	1.7	5.6	1.4	3.0	6.6	<0.010	<3.5	<2.0	**17**	<3.9
	P3-12 depth - upgradient																	
Not sampled	P3-12	2005	1	Phase I														
P3-12-2	P3-12	2007	3	Phase I	40	1.0	<0.5	4.1	<2	3.5	<30	<5	6.9	<0.05	<10	<5	9	10
P309-12B	P3-12	2009	5	Phase I	20-30	<1	<0.1	2.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	10	<10
SS11-002	P3-12	2011	7	Phase II	40-50	<2	0.1	10.1	2.1	4.1	<5	**8.1**	13.8	<0.45	<5	N/A	N/A	N/A
P314-12B	P3-12	2014	10	Phase II	20-30	1.0	0.03	4.1	2.0	3.3	<4.9	3.0	6.0	<0.10	<10	<50	<50	<100
P3-12B	P3-12	2019	15	Phase II	25-33	<1.0	<0.050	3.9	1.5	5.0	1.4	3.0	5.9	<0.010	<3.5	3.1	**32**	5.8

P3–12



LEGEND

TBM11 ⊡ TEMPORARY BENCHMARK

■ MONITORING SOIL SAMPLE LOCATION

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
10 0 10 20
1:600

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	*RF*	*RJ*	*CG*

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING NORTH LANDFILL 2019 SOIL ANALYTICAL RESULTS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE:
Meter	1 : 600	FEBRUARY 2020
DRAWN BY: *R. FLETCHER*	VERIFIED BY: *R. JANZEN*	APPROVED BY: *C. GRAVELLE, P.ENG*
PROJECT NO: 300002051	DRAWING NO: 30000251-PIN-3.5	PAGE: PL

FIGURE PIN-3.5B

7 PIN-3: NON-HAZARDOUS WASTE LANDFILL

7.1 Landfill Description

The Non-Hazardous Waste Landfill is located to the north of the airstrip between two access roads running north-south between the airstrip and the main station area. The landfill was constructed for the disposal of non-hazardous wastes, site debris, Type A hydrocarbon (lubrication oil and grease) contaminated soils, and Tier I contaminated soil, as defined in Abandoned Military Site Remediation Protocol (Reference K, Section 1.9).

The design of this landfill includes perimeter berms and the placement of a site derived granular fill cover over the landfilled material. Four groundwater monitoring wells were installed at the landfill perimeter. The long-term monitoring plan consists of visual inspection and the periodic collection of soil and groundwater samples.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-3.6A** located at the end of this landfill section.

7.2 Summary of Work Conducted

7.2.1 Visual Inspection

A visual inspection was completed at the Non-Hazardous Waste Landfill (NHWL) on 17 August 2019. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

7.2.2 Soil Sampling

Soil sampling at the Non-Hazardous Waste Landfill was conducted on August 18, 2019 and consisted of the collection of eight soil samples from four soil sample stations (MW-13, MW-14, MW-15 and MW-16). In addition, two blind field duplicates (samples MW-18B and MW-19B) were collected at depth from stations MW-13 and MW-14 respectively. Depth limitations were encountered at the following soil sampling stations:

- Station MW-14, where refusal on bedrock limited the depth of sample from 0.2 to 0.3 mbgs;
- Station MW-15, where refusal on bedrock limited the depth of sample from 0.3 to 0.4 mbgs; and,
- Station MW-16, where refusal on bedrock limited the depth of sample from 0.15 to 0.25 mbgs.

The following table outlines the soil sampling activities conducted at the Non-Hazardous Waste Landfill.

Table 7-1: Summary of Work Conducted by Soil Sampling Location - Non-Hazardous Waste Landfill

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
MW-13 (downgradient*)	MW-13A	0 - 0.15	Sand and organics, some gravel, rootlets, brown, moist
	MW-13B	0.4 - 0.5	Sand, some gravel and cobble, brown, moist
	MW-14A	0 - 0.15	Sand and organics, some gravel, rootlets, brown, moist

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
MW-14 (downgradient)	MW-14B	0.2– 0.3	Sand, some gravel and cobble, rootlets, brown, moist, refusal on bedrock
MW-15 (downgradient)	MW-15A	0 - 0.15	Sand and organics, some gravel, rootlets, brown, moist
	MW-15B	0.3– 0.4	Sand, some gravel and cobble, brown, rootlets, moist, refusal on bedrock
MW-16 (downgradient)	MW-16A	0 - 0.15	Sand and gravel, some organics, rootlets, few cobbles, dark brown, moist
	MW-16B	0.15 – 0.25	Sand and gravel, some cobble, trace organics, brown, moist, refusal on bedrock

* Soil sampling station MW-13 is classified as 'downgradient' because no consistent indication of upgradient and downgradient sampling locations exist for this landfill.

7.2.3 Groundwater Sampling

Groundwater monitoring at the Non-Hazardous Waste Landfill was conducted on August 18, 2019 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-13, MW-14, MW-15 and MW-16). The following table outlines the soil sampling activities conducted at the Non-Hazardous Waste Landfill.

Table 7-2: Summary of Work Conducted by Monitoring Well – Non-Hazardous Landfill

Monitoring Well ID	Observations	Number of Groundwater Samples Collected
MW-13 (downgradient)	Good condition	1
MW-14 (downgradient)	Good condition	1
MW-15 (downgradient)	Good condition	1
MW-16 (downgradient)	Good condition	1

Note: QA/QC duplicate samples were not included in totals listed above

Monitoring well sampling logs are presented in **Appendix D**.

7.2.4 Thermal Monitoring

No thermistors are present at the Non-Hazardous Waste Landfill; therefore, no thermal monitoring was performed as part of the 2019 monitoring program.

7.3 Results of the Monitoring Program

The following Sections 7.3.1 through 7.3.4 summarize the results of the PIN-3 monitoring program at the Non-Hazardous Waste Landfill.

7.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 7.3.1.1 through 7.3.1.5. **Figure PIN-3.6A** presents the visual inspection findings and photographic locations.

7.3.1.1 Inspection Checklist

The visual was completed as per the TOR and the visual inspection checklist is included below.

Table 7-3: Visual Inspection Checklist – Non-Hazardous Waste Landfill

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: Non-Hazardous Waste Landfill LANDFILL TYPE: Non-Hazardous DATE OF INSPECTION: 17 August 2019 WEATHER CONDITIONS: Overcast and breezy, intermittent clear periods.
DATE OF PREVIOUS INSPECTION: 18 August 2014
INSPECTED BY: Ryan Janzen
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.**

Table 7-3: Visual Inspection Checklist – Non-Hazardous Waste Landfill

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	N	A	Not observed.	NA	12 North	NA	NA	NA	NA	Feature not observed.	Consistent (not observed in 2014).	Not observed.	None
Settlement	Y	C1 C2	Landfill cap, towards S side.	7597577.286, 408820.149 7597582.512, 408808.638	12 North	5.4	0.1	0.05	<1%	Linear depression.	Consistent.	Acceptable.	NHLF_13, 14 NHLF_11, 12
Settlement	Y	D1 D2	Inside Feature K. NW landfill cap.	7597583.306, 408794.231 7597619.621, 408786.040	12 North	1.2 1.5	1 0.7	0.1 0.1	<1%	Minor depression. Pothole, fines infiltration.	Larger than previously noted. NEW OBSERVATION.	Acceptable.	NHLF_45 NHLF_47
Settlement	Y	E	SW landfill cap.	7597583.104, 408793.218	12 North	4.3	2.4	0.1	<1%	Minor depressions – appear to be equipment tracks.	Consistent. Previously noted as three separate depressions.	Acceptable.	NHLF_9, 10
Erosion	Y	F1 F2 F3	SW corner on slope.	7597568.719, 408772.918 7597567.999, 408774.716 7597570.063, 408776.978	12 North	3.0 4.7 4.7	0.15 0.25 0.25	0.05 0.05 0.05	<1% <1% <1%	Minor linear erosion channels.	Longer than previously noted.	Acceptable.	NHLF_3, 4, 8
Erosion	Y	G	SE corner on slope.	7597567.561, 408861.913	12 North	10	0.2	0.05	<1%	S-shaped minor erosion channel.	Longer than previously noted.	Acceptable.	NHLF_21
Erosion	Y	H1 H2 H3	W slope, from crest to mid-slope.	7597603.303, 408776.418 7597592.444, 408775.031 7597580.636, 408774.096	12 North	3.6 5.9 7.5	0.05 0.1 0.1	0.05 0.05 0.05	<1%	Minor erosion channels.	Consistent.	Acceptable.	NHLF_39 NHLF_35, 36 NHLF_37, 38
Lateral Movement	N												
Frost Action	N												
Sloughing	N												
Cracking	N												
Animal Burrows	N												
Vegetation Establishment	Y	I1 I2 I3	S slope. E slope. N slope.	7597563.085, 408820.206 7597600.855, 408870.049 7597636.235, 408817.816	12 North	442m^2 223m^2 718m^2	NA	<1%	Sparse vegetation.	Larger than previously noted.	Acceptable.	NHLF_4, 18 NHLF_19, 24 NHLF_25, 30	
Staining	N												
Vegetation Stress	N												
Seepage Points (or) Ponded Water	N												
Debris and/or Liner Exposed	Y	B	Landfill toe, SE corner.	7597576.911, 408868.206	12 North	0.4	0.4	NA	<1%	Black HDPE liner exposed.	Consistent.	Acceptable.	NHLF_20

Table 7-3: Visual Inspection Checklist – Non-Hazardous Waste Landfill

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Presence & Condition of Monitoring Instruments	Y	MW-13 MW-14 MW-15 MW-16	E of landfill. N of landfill. W of landfill. S of landfill.	7597598.544, 408881.694 7597655.462, 408811.653 7597591.944, 408760.322 7597552.556, 408801.928	12 North	NA	NA	NA	<1%	Monitoring wells.	Consistent.	Good exterior condition.	NHLF_22, 41
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Y	J	Landfill cap	7597633.365, 408806.053	12 North	16	0.15	0.05	<1%	ATV tracks up embankment.	NEW OBSERVATION.	Acceptable.	NHLF_46
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Y	K	Central landfill cap	7597610.745, 408826.199	12 North	900m^2		NA	~10%	Area of rough grading. Bulldozer blade and tread marks.	Consistent.	Acceptable.	NHLF_40, 42, 44

7.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Non-Hazardous Waste Landfill was conducted on 17 August 2019 as per the TOR and the results are provided below.

Table 7-4: Preliminary Stability Assessment – Non-Hazardous Waste Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Numerous
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Occasional
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Acceptable	Isolated
Other	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

7.3.1.3 Photographic Records

The detailed photographic record for the Non-Hazardous Waste Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record contains an index of photographs collected; full sized photographs are contained as a separately appended CD/DVD-ROM. **Figure PIN-3.6A** illustrates the photograph locations and directions.

7.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Non-Hazardous Waste Landfill. The following outlines the results of the visual trend analysis. Features where no significant change was observed are not included here.

Table 7-5: Visual Inspection Trends – Non-Hazardous Waste Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	D1	Observed area has increased from 0.28 m^2 in 2014 to 1.2 m^2 in 2019.
	D2	New observation.
Erosion	F1	Observed length has increased from 1.0 m in 2014 to 3.0 m in 2019.
	F2	Observed length has increased from 2.0 m in 2014 to 4.7 m in 2019.
	F3	Observed length has increased from 2.0 m in 2014 to 4.7 m in 2019.
	G	Observed length has increased from 7.0 m in 2014 to 10 m in 2019.
Vegetation Establishment	I	Coverage appears to have increased since 2014 (no measurements previously given).
Other	J	New observation.

7.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2019 monitoring events at the Non-Hazardous Waste Landfill indicates that a single settlement feature (Feature D1) was observed to be larger than previously noted, with one new feature of this type (Feature D2) observed. The erosive features F and G also appear to be lengthening. Vegetated areas appear to be expanding; though there were no dimensions given from the 2014 program a comparison of observed areas against previous figures indicates larger areas in 2019. A new observation in the form of ATV tracks up the North side of the structure (Feature J) was noted as well. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

The 'C' series of settlement features comprised four elements as noted in the 2014 report. Two of those elements were deemed to be equipment tracks inside Feature K (rough grading). The area denoted as Feature K contains multiple instances of such elements, and as such they are not considered to have been caused by settlement and are considered part of Feature K.

7.3.2 Soil Sampling

Soil sampling of the Non-Hazardous Waste Landfill was conducted on August 18, 2019. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR and details are provided below in the following sections.

7.3.2.1 Laboratory Analytical Results

A total of ten soil samples (including two field duplicates) were collected from four soil sample locations at the Non-Hazardous Waste Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 5** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are

presented in **Appendix B** of this report. **Figure PIN-3.6B** presents a summary of current and historical soil analytical results and is located at the end of this landfill section.

7.3.2.2 Summary of Soil Results

The soil results for 2019 are presented in the following table. The background and baseline mean are presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 7-6: Evaluation of Results by Parameter – Non-Hazardous Waste Landfill

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Arsenic (As)	1.0	1.3	**6.3**	All soil sample results were below the BL+3SD at all four sampling stations.
Cadmium (Cd)	1.0	1.0	**1.0**	All soil sample results were below the BL+3SD at all four sampling stations.
Chromium (Cr)	20.0	20.0	**20.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	5.0	5.0	**5.0**	All soil sample results were below the BL+3SD all four sampling stations.
Copper (Cu)	12.6	9.6	**22.0**	All soil sample results were below the BL+3SD all four sampling stations.
Lead (Pb)	10.0	10.0	**10.0**	All soil sample results were below the BL+3SD all four sampling stations.
Nickel (Ni)	6.7	5.0	**5.0**	All soil sample results were below the BL+3SD all four sampling stations.
Zinc (Zn)	16.4	15.0	**15.0**	All soil sample results were below the BL+3SD all four sampling stations.
PCBs (Total)	0.1	0.1	**0.1**	All soil sample results were below the BL+3SD all four sampling stations.
F1 (C_6-C_{10})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD all four sampling stations.
F2 (C_{10}-C_{16})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD all four sampling stations.
F3 (C_{16}-C_{34})	N/A	69.9	**283.1**	All soil sample results were below the BL+3SD all four sampling stations.
F4 (C_{34}-C_{50})	N/A	97.8	**441.4**	All soil sample results were below the BL+3SD all four sampling stations.

7.3.2.3 Discussion of Soil Results

All soil samples at surface and depth collected around the Non-Hazardous Waste Landfill in 2019 had concentrations below the BL+3SD for all parameters. Furthermore, the 2019 soil results were comparable on all four sides of the landfill and there is no indication of contaminant migration from the landfill at this time.

As seven sampling events worth of soil data has yet to be collected, a trend evaluation has not been completed as part of the 2019 monitoring program. The performance of the landfill should be re-evaluated once seven sampling events worth of data are available.

7.3.3 Groundwater Sampling

7.3.3.1 Monitoring Well Sampling/Inspection Logs

As per Section 5.3.3.2 of the TOR, groundwater monitoring logs were filled out for each monitoring well. Monitoring well sampling logs are presented in **Appendix D.**

7.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were measured and are presented in the following table.

Table 7-7: Summary of Groundwater Levels – Non-Hazardous Waste Landfill

Monitoring Well ID	Monitoring Well Elevation (masl)	Water Level (mbtoc)	Well Stick up (m)	Water Level (mbgs)	Groundwater Elevation (masl)
MW-13	15.12	1.655	0.35	1.31	13.47
MW-14	14.28	1.135	0.54	0.60	13.15
MW-15	14.49	1.520	0.56	0.97	12.97
MW-16	14.42	1.160	0.76	0.41	13.26

Note: masl = metres above sea level, mbtoc = metre below top of casing, mbgs = metres below ground surface

Based on these 2019 findings, the highest groundwater elevation was measured at well MW-13 on the east side of the landfill. Groundwater contours are presented on **Figure PIN-3.6C** located at the end of this landfill section.

7.3.3.3 Groundwater Laboratory Analytical Results

A groundwater sample was collected from each of four monitoring wells at the Non-Hazardous Waste Landfill and analysed for total inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc) and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 5A** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-3.6C** presents a summary of current and historical groundwater analytical results and is located at the end of this landfill section.

7.3.3.4 Summary of Groundwater Results

The groundwater results for 2019 are presented in the following table. The baseline mean is presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 7-8: Evaluation of Groundwater Analytical Results – Non-Hazardous Waste Landfill

Parameter	Baseline Mean (mg/L)	Baseline Mean+3SD (mg/L)	Discussion of Results
Arsenic (As)	0.0030	**0.0030**	All groundwater sample results were below the BL+3SD at all four sample locations.
Cadmium (Cd)	0.0010	**0.0010**	All groundwater sample results were below the BL+3SD at all four sample locations.
Chromium (Cr)	0.0410	**0.1317**	All groundwater sample results were below the BL+3SD at all four sample locations.
Cobalt (Co)	0.0030	**0.0030**	All groundwater sample results were below the BL+3SD at all four sample locations.
Copper (Cu)	0.0122	**0.0253**	All groundwater sample results were below the BL+3SD at all four sample locations.
Lead (Pb)	0.0100	**0.0100**	All groundwater sample results were below the BL+3SD at all four sample locations.
Nickel (Ni)	0.0212	**0.0597**	All groundwater sample results were below the BL+3SD at all four sample locations.
Zinc (Zn)	0.0192	**0.0514**	All groundwater sample results were below the BL+3SD at all four sample locations.
F1 (C_6-C_{10})	0.05	**0.05**	Samples at MW-13, MW-14 and MW-16 were above the BL+3SD at 0.053 mg/L, 0.071 mg/L, and 0.071 mg/L respectively, but were within 3 times the baseline mean.
F2 (C_{10}-C_{16})	0.5	**0.5**	All groundwater sample results were below the BL+3SD at all four sample locations.
F3 (C_{16}-C_{34})	1	**1**	All groundwater sample results were below the BL+3SD at all four sample locations.
F4 (C_{34}-C_{50})	1	**1**	All groundwater sample results were below the BL+3SD at all four sample locations.

7.3.3.5 Discussion of Groundwater Results

The Non-Hazardous Waste Landfill has no clear upgradient and downgradient sampling locations based on the relatively level elevation of the surrounding land. However, as the highest groundwater elevation measured during the field program was recorded at well MW-13 on the east side of the landfill, well MW-13 will be considered the upgradient well in this discussion.

All upgradient and downgradient groundwater sample results in 2019 were below the BL+3SD for all parameters except PHC F1. The PHC F1 concentrations in groundwater samples from wells MW-13, MW14, and MW-16 slightly exceeded the BL+3SD for PHC F1 of 0.05 mg/L at 0.053 mg/L, 0.071 mg/L, and 0.071 mg/L respectively. It should be noted that the BL+3SD value for PHC F1 at this landfill was set to the analytical detection limit and no standard deviation was calculated because the PHC F1 concentration was below the analytical detection limit of 0.05 mg/L in all baseline samples. As these three exceedances are less than 3 times the baseline mean, they are not outside the expected range for concentration variability. Furthermore, given that the action level for PHC remediation at DEW Line sites is typically 2500 mg/kg, hydrocarbon contamination is not uncommon in the vicinity of the landfills.

As seven sampling events worth of groundwater data has yet to be collected, a trend evaluation has not been completed as part of the 2019 monitoring program. The performance of the landfill should be re-evaluated once seven sampling events worth of data are available.

7.3.4 Thermal Monitoring

No thermistors are present at the Non-Hazardous Waste Landfill; therefore, no thermal monitoring was conducted as part of the 2019 monitoring program.

7.4 Overall Landfill Performance, Conclusions and Recommendations

As the 2019 monitoring program is only the sixth monitoring program to have been conducted at the Non-Hazardous Waste Landfill, trends in soil concentrations were not evaluated. However, based on the limited chemical data collected to date and observations made during the 2019 field program, the landfill appears to be performing as intended with no apparent indications of contaminant migration.

Based on this review, it is recommended to continue the long-term monitoring of soils as planned and the performance of the landfill be re-evaluated once laboratory results from seven monitoring events are available.

Based on the results of the visual inspection, the Non-Hazardous Waste Landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

Based on the results of the 2019 monitoring program, the overall performance of the Non-Hazardous Waste Landfill is acceptable.

E 408750
E 408800
E 408850
E 408900
E 408950
N 7597650
N 7597600
N 7597550

FEATURE I
VEGETATION (SITE WIDE)

FEATURE J
OTHER (ATV RUTS)

FEATURE K
ROUGH GRADING

NON–HAZARDOUS
WASTE LANDFILL

ACCESS ROAD

FEATURE D
SETTLEMENT

FEATURE H
3 x EROSION

FEATURE E
3 x SETTLEMENT

FEATURE C
4 x SETTLEMENT

FEATURE B
DEBRIS

FEATURE F
3 x SETTLEMENT

FEATURE G
EROSION

REGRADE AREA

MW–14
MW–15
MW–16
MW–13
BM–3
TBM214
S1
S2
S3
S4
D1
D2
H1
H2
H3
C1
C2
F1
F2
F3

FEATURE F
EROSION

FEATURE E
ROUGH GRADING

FEATURE C
SETTLEMENT

FEATURE G
EROSION

LEGEND

- TBM214 — TEMPORARY BENCHMARK
- BM–3 — PERMANENT BENCHMARK
- MW–13 — MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION
- ROUGH GRADING
- SPARSE VEGETATION
- SETTLEMENT
- EROSION
- DEBRIS
- OTHER (ATV RUTS)
- X — APPROX. PHOTOGRAPHIC VIEWPOINT (2019)
- 2014 VISUAL INSPECTION OBSERVATIONS (FOR REFERENCE)

NOTE:
RED = 2019 FEATURES
PURPLE = 2014 FEATURES

Meters
15 0 15 30
1:700

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

NON HAZARDOUS WASTE LANDFILL
2019 & 2014 VISUAL INSPECTION

ARCADIS
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FIGURE PIN-3.6A



Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-14 surface - downgradient																		
05-26700	MW-14	2005	1	Phase I	0	1.1	<1	<20	<5	9.5	<10	<5	<15	<0.003	<10	10	41	44
P3-MW-14-1	MW-14	2007	3	Phase I	10	1.2	<0.5	3.7	<2	**22.0**	<30	**6.7**	**54.1**	0.01	<10	<5	**110**	**130**
P309-14WA	MW-14	2009	5	Phase I	0-15	**3.0**	<0.1	2.0	<1	<5	1.0	3.0	<10	<0.01	<12	**12**	36	11
P309-BD1 (Dup)	MW-14	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	<5	1.0	2.0	<10	<0.01	<12	10	37	12
SS11-037	MW-14	2011	7	Phase II	0-15	<2	0.1	<5	<1	5.1	<5	2.9	13.7	<0.45	<5	N/A	N/A	N/A
P314-14WA	MW-14	2014	10	Phase II	0-15	0.7	0.21	2.0	0.9	**10.1**	<4.9	3.2	11.0	<0.10	<10	<50	<50	<100
MW-14A	MW-14	2019	15	Phase II	0-15	**2.0**	<0.050	2.8	1.2	4.4	1.2	2.7	4.2	<0.010	<3.5	<3.0	20	<4.7
MW-14 depth - downgradient																		
05-26702	MW-14	2005	1	Phase I	20	**1.5**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	<9	11
P3-MW-14-2	MW-14	2007	3	Phase I	20	**3.3**	<0.5	3.5	<2	3.9	<30	<5	6.7	<0.01	<10	<5	<5	<5
P309-14WB	MW-14	2009	5	Phase I	35-42	1.0	<0.1	2.0	<1	<5	<1	1.0	<10	<0.01	<12	<10	16	<10
SS11-038	MW-14	2011	7	Phase II	40-50	<2	0.1	**41.0**	1.4	5.9	<5	**20.8**	12.1	<0.45	<5	N/A	N/A	N/A
P314-14WB	MW-14	2014	10	Phase II	30-40	1.3	0.02	2.7	1.3	1.6	<4.9	1.9	3.0	<0.10	<10	<50	<50	<100
MW-14B	MW-14	2019	15	Phase II	20-30	**2.1**	<0.050	2.9	1.2	4.2	1.2	3.1	4.9	<0.010	<3.5	<3.0	11	<4.7
MW-19B (Dup)	MW-14	2019	15	Phase II	20-30	**2.0**	<0.050	3.0	1.3	3.7	1.0	2.8	4.0	<0.010	<3.5	<2.0	17	<3.9

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-13 surface - downgradient (no clear indication of upgradient and downgradient sampling locations, all classified as downgradient)																		
05-26688	MW-13	2005	1	Phase I	0	1.1	<1	<20	<5	6.8	<10	<5	<15	<0.003	<10	<4	33	24
P3-MW-13-1	MW-13	2007	3	Phase I	10	0.884	<0.5	5.2	<2	6.0	<30	<5	10.2	<0.01	<10	**11**	**180**	37
P309-13WA	MW-13	2009	5	Phase I	0-15	**3.0**	<0.1	3.0	2.0	5.0	2.0	4.0	<10	<0.01	<12	<10	36	12
SS11-035	MW-13	2011	7	Phase II	0-15	<2	0.1	**74.3**	2.7	7.2	<5	**37.1**	13.8	<0.45	<5	N/A	N/A	N/A
P314-13WA	MW-13	2014	10	Phase II	0-15	1.0	0.11	4.2	2.3	**17.6**	6.3	3.1	12.0	<0.10	<10	<50	<50	<100
P314-BD4 (Dup)	MW-13	2014	10	Phase II	0-15	0.9	0.11	4.5	2.4	8.6	7.1	3.7	11.0	<0.10	<10	<50	<50	<100
P314-13WA (Interlab)	MW-13	2014	10	Phase II	0-15	**1.6**	0.1	**35.0**	1.9	8.9	7.4	**17.0**	<10	<0.01	<12	<10	<50	N/A
MW-13A	MW-13	2019	15	Phase II	0-15	<1.0	0.064	3.6	1.5	6.7	4.1	2.8	6.6	<0.010	<3.5	<3.0	27	<4.7
MW-13 depth - downgradient																		
05-26690	MW-13	2005	1	Phase I	30	1.1	<1	<20	<5	6.8	<10	<5	<15	<0.003	<10	<4	12	12
P3-MW-13-2	MW-13	2007	3	Phase I	50	0.998	<0.5	4.4	2.1	8.0	<30	<5	7.0	<0.01	<10	5	**190**	<5
P309-13WB	MW-13	2009	5	Phase I	28-38	**3.0**	<0.1	3.0	2.0	<5	1.0	4.0	<10	<0.01	<12	<10	13	<10
SS11-036	MW-13	2011	7	Phase II	40-50	<2	0.1	**83.4**	3.2	8.2	<5	**40.7**	12.9	<0.45	<5	N/A	N/A	N/A
P314-13WB	MW-13	2014	10	Phase II	40-50	0.8	0.03	2.8	1.7	5.6	<5	2.2	4.0	<0.10	<10	<50	<50	<100
MW-13B	MW-13	2019	15	Phase II	40-50	<1.0	<0.050	3.3	1.4	7.2	1.7	2.5	4.8	<0.010	<3.5	<3.0	25	<4.7
MW-18B (Dup)	MW-13	2019	15	Phase II	40-50	<1.0	<0.050	3.8	1.3	6.9	1.6	2.4	4.1	<0.010	<3.5	3.1	28	6.9

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-15 surface - downgradient																		
05-2694	MW-15	2005	1	Phase I	0	1.1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6.9	44	34
P3-MW-15-1	MW-15	2007	3	Phase I	10	0.489	<0.5	3.6	<2	9.1	<30	<5	10.0	<0.01	<10	<5	12	17
P309-15WA	MW-15	2009	5	Phase I	0-15	<1	<0.1	1.0	<1	<5	<1	1.0	<10	<0.01	<12	<10	36	<10
SS11-039	MW-15	2011	7	Phase II	0-15	<2	<0.1	**65.2**	3.4	8.5	<5	**33.9**	**16.3**	<0.45	<5	N/A	N/A	N/A
P314-15WA	MW-15	2014	10	Phase II	0-15	0.6	0.07	2.6	1.4	8.1	6.4	2.3	11.0	<0.10	<10	<50	<50	<100
MW-15A	MW-15	2019	15	Phase II	0-15	<1.0	<0.050	2.6	1.2	5.7	0.97	2.0	5.2	<0.010	<3.5	<3.0	20	<4.7
MW-15 depth - downgradient																		
05-2696	MW-15	2005	1	Phase I	30	<1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	5	<9	<8
P3-MW-15-2	MW-15	2007	3	Phase I	50	0.957	<0.5	4.2	<2	8.8	<30	<5	5.5	<0.01	<10	<5	<5	<5
P3-19-2 (Dup)	MW-15	2007	3	Phase I	50	1.07	<0.5	4.2	2.1	6.2	<30	<5	7.1	<0.05	<10	<5	<5	8
P3-19-2 (Interlab)	MW-15	2007	3	Phase I	50	<10	<0.5	4.0	2.0	3.0	<5	3.0	6.0	<0.03	<5	<80	<250	N/A
P309-15WB	MW-15	2009	5	Phase I	40-50	<1	<0.1	2.0	1.0	<5	2.0	2.0	<10	<0.01	<12	<10	20	<10
SS11-041	MW-15	2011	7	Phase II	40-50	<2	0.2	**48.2**	3.4	**14.6**	<5	2.9	6.0	<0.45	<5	N/A	N/A	N/A
P314-15WB	MW-15	2014	10	Phase II	40-50	0.9	0.06	4.4	2.0	5.1	<5	2.9	6.0	<0.10	<10	<50	<50	<100
MW-15B	MW-15	2019	15	Phase II	30-40	<1.0	<0.050	4.1	1.4	6.7	1.5	2.4	5.6	<0.010	<3.5	<3.0	14	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-16 surface - downgradient																		
05-2692	MW-16	2005	1	Phase I	1.1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<10	4.1	29	22
P3-MW-16-1	MW-16	2007	3	Phase I	1.1	<0.5	**4.2**	<2	**6.9**	<30	<5	**9.0**	<0.01	<10	<10	<5	19	<5
P3-MW-16-2 (Dup)^	MW-16	2007	3	Phase I	1.07	<0.5	**3.6**	<2	4.4	<30	<5	**7.4**	<0.01	<10	<10	<5	39	11
P309-16WA	MW-16	2009	5	Phase I	<1	<0.1	**2.0**	<1	<5	2.0	2.0	<10	<0.01	<12	<12	<10	45	15
SS11-033	MW-16	2011	7	Phase II	<2	0.1	**12.8**	1.2	**5.6**	<5	9.0	**17.6**	<0.45	<5	<5	N/A	N/A	N/A
P314-16WA	MW-16	2014	10	Phase II	0.8	0.08	**2.5**	1.3	3.1	<5	2.0	**7.0**	<0.10	<10	<10	<50	<50	<100
MW-16A	MW-16	2019	15	Phase II	0-15	<1.0	0.057	2.6	0.98	4.1	1.9	2.2	7.9	<0.010	<3.5	<3.0	**84**	<4.7
MW-16 depth - downgradient																		
Not sampled -refusal	MW-16	2005	1	Phase I														
Not sampled -refusal	MW-16	2007	3	Phase I														
Not sampled -refusal	MW-16	2009	5	Phase I														
SS11-034	MW-16	2011	7	Phase II	30-40	<2	<0.1	16.3	1.5	3.0	<5	**9.4**	10.0	<0.45	<5	N/A	N/A	N/A
Not sampled -refusal	MW-16	2014	10	Phase II														
MW-16B	MW-16	2019	15	Phase II	15-25	<1.0	<0.050	2.3	0.82	2.0	1.5	1.8	4.4	<0.010	<3.5	<3.0	19	<4.7

PIN-3 Non-Hazardous Waste Landfill	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**1.3**	**1.0**	**20.0**	**5.0**	**9.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**69.9**	**97.8**
Baseline Data - Standard Deviation	1.7	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.00	0.0	0.0	71.1	114.5
Baseline Data Mean + 3 x Standard Deviation	**6.3**	**1.0**	**20.0**	**5.0**	**22.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**283.1**	**441.4**
**If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

- TBM214 — TEMPORARY BENCHMARK
- BM–3 — PERMANENT BENCHMARK
- MW–13 — MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
15 0 15 30
1:700

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

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COLLECTION OF LANDFILL MONITORING DATA

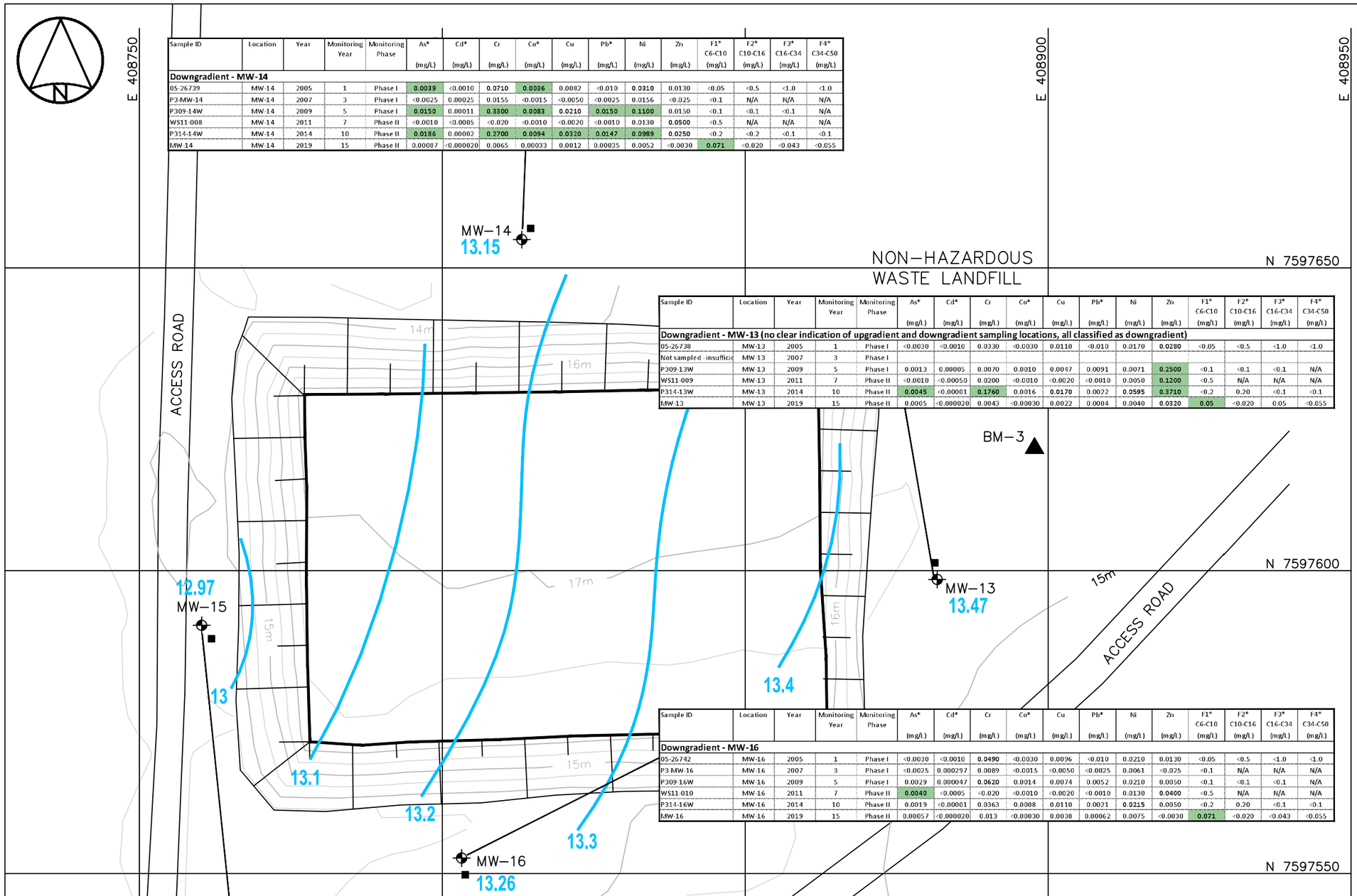
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

NON HAZARDOUS WASTE LANDFILL 2019 SOIL ANALYTICAL RESULTS

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MEASUREMENT UNIT	SCALE:	DATE: (month-year)
Meter	1 : 700	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	R. JANZEN	C. GRAVELLE, P.ENG
PROJECT NO.:	DRAWING NO.:	PAGE
30000251	30000251-PIN-3.6	PL

FIGURE PIN-3.6B



Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-14																
05-26739	MW-14	2005	1	Phase I	**0.0039**	<0.0010	**0.0710**	**0.0036**	0.0082	<0.010	**0.0310**	0.0130	<0.05	<0.5	<1.0	<1.0
P3-MW-14	MW-14	2007	3	Phase I	<0.0025	0.00025	0.0155	<0.0015	<0.0050	<0.0025	0.0156	<0.025	<0.1	N/A	N/A	N/A
P309-14W	MW-14	2009	5	Phase I	**0.0150**	0.00011	**0.3300**	**0.0083**	**0.0210**	**0.0150**	**0.1100**	0.0150	<0.1	<0.1	<0.1	N/A
WS11-008	MW-14	2011	7	Phase II	<0.0010	<0.0005	<0.020	<0.0010	<0.0020	<0.0010	0.0130	**0.0500**	<0.5	N/A	N/A	N/A
P314-14W	MW-14	2014	10	Phase II	**0.0186**	0.00002	**0.2700**	**0.0094**	**0.0320**	**0.0147**	**0.0989**	**0.0250**	<0.2	<0.2	<0.1	<0.1
MW-14	MW-14	2019	15	Phase II	0.00087	<0.000020	0.0065	0.00033	0.0012	0.00035	0.0052	<0.0030	**0.071**	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-13 (no clear indication of upgradient and downgradient sampling locations, all classified as downgradient)																
05-26738	MW-13	2005	1	Phase I	<0.0030	<0.0010	0.0330	<0.0030	0.0110	<0.010	0.0170	**0.0280**	<0.05	<0.5	<1.0	<1.0
Not sampled - insufficie	MW-13	2007	3	Phase I												
P309-13W	MW-13	2009	5	Phase I	0.0013	0.00005	0.0070	0.0010	0.0047	0.0091	0.0071	**0.2500**	<0.1	<0.1	<0.1	N/A
WS11-009	MW-13	2011	7	Phase II	<0.0010	<0.00050	0.0200	<0.0010	<0.0020	<0.0010	0.0050	**0.1200**	<0.5	N/A	N/A	N/A
P314-13W	MW-13	2014	10	Phase II	**0.0045**	<0.00001	**0.1760**	0.0016	**0.0170**	0.0022	**0.0595**	**0.3710**	<0.2	0.20	<0.1	<0.1
MW-13	MW-13	2019	15	Phase II	0.0005	<0.000020	0.0043	<0.00030	0.0022	0.0004	0.0040	**0.0320**	**0.05**	<0.020	0.05	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-16																
05-26742	MW-16	2005	1	Phase I	<0.0030	<0.0010	**0.0490**	<0.0030	0.0096	<0.010	0.0210	0.0130	<0.05	<0.5	<1.0	<1.0
P3-MW-16	MW-16	2007	3	Phase I	<0.0025	0.000297	0.0089	<0.0015	<0.0050	<0.0025	0.0061	<0.025	<0.1	N/A	N/A	N/A
P309-16W	MW-16	2009	5	Phase I	0.0029	0.000047	**0.0620**	0.0014	0.0074	0.0052	0.0210	0.0050	<0.1	<0.1	<0.1	N/A
WS11-010	MW-16	2011	7	Phase II	**0.0040**	<0.0005	<0.020	<0.0010	<0.0020	<0.0010	0.0130	**0.0400**	<0.5	N/A	N/A	N/A
P314-16W	MW-16	2014	10	Phase II	0.0019	<0.00001	0.0363	0.0008	0.0110	0.0021	**0.0215**	0.0050	<0.2	0.20	<0.1	<0.1
MW-16	MW-16	2019	15	Phase II	0.00057	<0.000020	0.013	<0.00030	0.0038	0.00062	0.0075	<0.0030	**0.071**	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-15																
05-26741	MW-15	2005	1	Phase I	<0.0030	<0.001	0.0150	<0.0030	**0.0220**	**0.0120**	**0.0320**	**0.0310**	<0.05	<0.5	<1.0	<1.0
05-26740 (Dup)	MW-15	2005	1	Phase I	**0.0100**	<0.001	**0.0900**	**0.0040**	0.0080	<0.010	**0.0400**	0.0100	<0.05	<0.5	<1.0	<1.0
P3-MW-15	MW-15	2007	3	Phase I	<0.0025	<0.000085	<0.0050	**0.0095**	<0.0050	<0.0025	0.0154	<0.025	<0.1	N/A	N/A	N/A
P309-15W	MW-15	2009	5	Phase I	0.0018	0.000036	0.0040	0.0016	**0.0140**	0.0095	0.0061	**0.0280**	<0.1	<0.1	<0.1	N/A
WS11-006	MW-15	2011	7	Phase II	0.0030	<0.0005	<0.020	0.0010	<0.0020	<0.0010	0.0200	**0.0900**	<0.5	N/A	N/A	N/A
WS11-007 (Dup)	MW-15	2011	7	Phase II	0.0030	<0.0005	<0.020	0.0010	<0.0020	<0.0010	0.0210	**0.1000**	<0.5	N/A	N/A	N/A
WS11-006 (Interlab)	MW-15	2011	7	Phase II	0.0007	0.000016	<0.0010	0.0007	0.0022	0.0003	0.0075	<0.0030	<0.1	<0.1	<0.1	<0.1
P314-15W	MW-15	2014	10	Phase II	**0.0069**	<0.00001	0.0377	0.0020	0.0090	**0.0120**	**0.0224**	**0.0260**	<0.2	0.20	<0.1	0.10
MW-15	MW-15	2019	15	Phase II	0.00054	<0.000020	<0.0010	0.00075	0.0051	0.00044	0.0049	0.010	<0.015	<0.020	<0.043	<0.055

PIN-3 Non-Hazardous Waste Landfill	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Baseline Data - Arithmetic Mean	0.0029	0.0005	0.0410	0.0020	0.0122	0.0050	0.0212	0.0192	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit	**0.0030**	**0.0010**	**0.0410**	**0.0030**	**0.0122**	**0.0100**	**0.0212**	**0.0192**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation	0.0000	0.0000	0.0302	0.0000	0.0044	0.0000	0.0128	0.0107	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation	**0.0030**	**0.0010**	**0.1317**	**0.0030**	**0.0253**	**0.0100**	**0.0597**	**0.0514**	**0.05**	**0.5**	**1.0**	**1.0**

*If baseline or background arithmetic mean was below the detection limit, then mean has been modified to match the detection limit value.

LEGEND

- TBM214 — TEMPORARY BENCHMARK
- BM–3 — PERMANENT BENCHMARK
- MW–13 — MONITORING WELL LOCATION
- MONITORING SOIL SAMPLE LOCATION
- INTERPRETED GROUNDWATER FLOW CONTOURS
- 7.72 — GROUNDWATER ELEVATION (M.A.S.L.)

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
15 0 15 30
1:700

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

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COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

NON HAZARDOUS WASTE LANDFILL 2019 GROUNDWATER ANALYTICAL RESULTS

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MEASUREMENT UNIT	SCALE:	DATE (month-day-year):
Meter	1 : 700	FEBRUARY 2020
DRAWN BY:	WORKED BY:	APPROVED BY:
R. FLETCHER	R. JANZEN	C. GRAVELLE, P.ENG
PROJECT NO.:	DWG NO.:	PAGE:
30000251	30000251-PIN-3.6	PL

FIGURE PIN-3.6C

8 PIN-3: TIER II SOIL DISPOSAL FACILITY

8.1 Landfill Description

The Tier II Soil Disposal Facility was constructed at the Lady Franklin Point site for the disposal of Tier II contaminated soil, as defined in Abandoned Military Site Remediation Protocol (Reference K, Section 1.9). The Tier II Soil Disposal Facility is located south of the airstrip, towards its eastern end.

The design of this landfill included a double containment system consisting of a liner system and the placement of sufficient surface fill to promote permafrost aggradation through landfill contents. Landfilled soils were fully contained, with an HDPE liner was placed along the bottom of the landfill, up the embankments and over the top of the landfill contents. The long-term monitoring plan for the Tier II Soil Disposal Facility consists of visual inspection, periodic collection of soil and groundwater samples and monitoring of subsurface ground temperatures in the berms and in the main body of the disposal facility via thermistors.

The Tier II Soil Disposal Facility layout, visual observations and photographic locations are presented on **Figure PIN-3.7A** located at the end of this landfill section.

8.2 Summary of Work Conducted

8.2.1 Visual Inspection

A visual inspection was completed at the Tier II Soil Disposal Facility 16 August 2019. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

8.2.2 Soil Sampling

Soil sampling at the Tier II Soil Disposal Facility was conducted on August 16, 2019 and consisted of the collection of eight soil samples from four soil sample stations (MW-9, MW-10, MW-11, and MW-12). In addition, one blind field duplicate (sample MW-17B) was collected at depth from station MW-12. The following table outlines the soil sampling activities conducted at the Tier II Soil Disposal Facility.

Table 8-1: Summary of Work Conducted by Soil Sampling Location – Tier II Soil Disposal Facility

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
MW-9 (upgradient)	MW-9A	0 - 0.15	Sand and gravel, trace organics, rootlets, brown, dry
	MW-9B	0.4 – 0.5	Sand and gravel, some cobble, brown, dry
MW-10 (downgradient)	MW-10A	0 - 0.15	Sand and organics, trace gravel, rootlets, brown changing to greyish brown with depth, dry
	MW-10B	0.4 – 0.5	Sand, some gravel, greyish brown, dry
MW-11 (downgradient)	MW-11A	0 - 0.15	Sand and organics, some Gravel, rootlets, brown to greyish brown, dry
	MW-11B	0.4 – 0.5	Sand, some gravel, greyish brown, dry
MW-12 (downgradient)	MW-12A	0 - 0.15	Sand and organics, some gravel, rootlets, greyish brown, dry

Sample Location	Sample ID	Sample Depth (mbgs)	Notes
	MW-12B	0.4 – 0.5	Sand, some gravel, greyish brown, dry

8.2.3 Groundwater Sampling

Groundwater monitoring at the Tier II Soil Disposal Facility was conducted on August 16, 2019 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-9, MW-10, MW-11 and MW-12). One well, MW-9, was observed to be frozen. Monitoring wells MW-10, MW-11 and MW-12 contained water and groundwater samples were collected for analysis. One field duplicate (sample MW-17) was collected from well MW-12. The following table outlines the groundwater sampling activities conducted at the Tier II Soil Disposal Facility.

Table 8-2: Summary of Work Conducted by Monitoring Well – Tier II Soil Disposal Facility

Monitoring Well ID	Observations	Number of Groundwater Samples Collected
MW-9 (upgradient)	Some damaged to the hinge on the well's casing was observed but the casing's lid remains functional and securable. In addition, the groundwater in the well was frozen at the time of the field program.	none
MW-10 (downgradient)	A slight restriction in the well was detected at 1.5 m below the top of the well's casing; however, the restriction did not prevent interface probe use or interfere with the temporary installation of the 6 mm diameter tubing for groundwater sampling.	1
MW-11 (downgradient)	Good condition	1
MW-12 (downgradient)	Good condition	1

Monitoring well sampling logs are presented in **Appendix D**.

8.2.4 Thermal Monitoring

Four thermistors (VT5, VT6, VT7 and VT8) are present at the Tier II Soil Disposal Facility. Each of the thermistor installations was inspected and the data on each datalogger was downloaded. All four thermistor dataloggers reinstalled at the site were reprogrammed to collect data every 48 hours at noon. The following table summarizes the 2019 thermal monitoring at the Tier II Soil Disposal Facility.

Table 8-3 Summary of 2019 Thermal Monitoring at Tier II Soil Disposal Facility

Thermistor ID	Observations/Notes
VT-5	An error was encountered when the logger was connected to the field laptop. The cause of the error was suspected to be hardware related. Complete Memory Transfer was completed. Limited data could be recovered by Lakewood. The logger at VT-5 (serial number 108066) was replaced with spare logger (serial number 07110006).
VT-6	Bead 16 appears to be malfunctioning.
VT-7	Time on logger did not match local time. Bead 16 appears to be malfunctioning.
VT-8	An error was encountered when the logger was connected to the field laptop. The cause of the error was suspected to be hardware related. Complete Memory Transfer was completed. No data could be recovered by Lakewood. The logger at VT-7 (serial number 111099) was replaced with spare logger (serial number 07110055).

It should be noted that the time on each datalogger was corrected (when necessary) to the local time prior to reinstallation. In addition, the datalogger in thermistor VT-5 and VT-8 (serial numbers 108066 and 111099 respectively) were brought south for repair.

Updated (2019) thermistor inspection reports for each of the installations are located in **Appendix C**.

8.3 Results of the Monitoring Program

The following Sections 8.3.1 through 8.3.4 summarize the results of the PIN-3 monitoring program at the Tier II Disposal Facility.

8.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 8.3.1.1 through 8.3.1.5. **Figure PIN-3.7A** presents the visual inspection findings and photographic locations.

8.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR and the checklist is included below.

Table 8-4: Visual Inspection Checklist –Tier II Soil Disposal Facility

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: Tier II Soil Disposal Facility LANDFILL TYPE: Tier II DATE OF INSPECTION: 16 August 2019 WEATHER CONDITIONS: Overcast, breezy, scattered showers.
DATE OF PREVIOUS INSPECTION: 14 August 2014
INSPECTED BY: Ryan Janzen
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.**

Table 8-4: Visual Inspection Checklist –Tier II Soil Disposal Facility

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Y	A	N slope, close to VT-6.	7597411.964, 409551.452	12 North	3.0	1.5	0.15	<1%	Slight depression.	Slightly wider than previously noted.	Acceptable.	T2LF_57
Settlement	Y	B1	SW crest.	7597350.257, 409481.727	12 North	4.0	1.3	0.1	<1%	Minor linear depressions.	Larger than previously noted.	Acceptable.	T2LF_17, 18
		B2	S crest, midpoint.	7597350.175, 409508.327		5.0	1.0	0.15			Larger than previously noted.		T2LF_40, 41
Settlement	Y	C1	S slope, midslope.	7597339.109, 409546.337	12 North	2	1.2	0.1	<1%	Slight depressions.	Consistent.	Acceptable.	T2LF_34
		C2	S slope crest.	7597348.819, 409536.744		1.5	1.0	0.1			Consistent.		T2LF_36
		C3	Landfill cap, central.	7597388.876, 409541.686		14m^2		0.1			Larger than previously noted.		T2LF_58, 59
Settlement	Y	D1	E slope, near SE corner.	7597389.453, 409571.721	12 North	2.6	1.4	0.1	<1%	Pothole depression (fines infiltration).	Larger than previously noted.	Acceptable.	T2LF_45
		D2	E slope crest, midpoint.	7597368.744, 409573.980		1.7	0.9	0.1		Combination of rough grading and fines infiltration.			T2LF_46 through 48
Settlement	Y	E1	NW corner, on slope close to crest.	7597412.425, 409476.233	12 North	4.0	0.3	0.15	<1%	Minor linear depression.	Consistent.	Acceptable.	T2LF_7
		E2	N slope near VT-5.	7597415.202, 409512.830		10m^2		0.15		Depressed area.			T2LF_61
		E3	Landfill cap near VT-5.	7597409.971, 409515.895		7.3m^2		0.1		Slight depression. Shape indicates it is possibly due to equipment tracks.			T2LF_62
Erosion	Y	F1	E slope, NE corner at crest.	7597402.713, 409579.232	12 North	17	0.3	0.1	<1%	Minor linear erosion.	Consistent.	Acceptable.	T2LF_52
		F2	E slope, NE corner at toe.	7597423.502, 409586.828		8.2	0.1	0.15					T2LF_55
Erosion	Y	G1	SE corner, toe to midslope.	7597325.839, 409582.265	12 North	17	1.0	0.15	<1%	Combination of erosion and equipment track mark.	Longer than previously noted.	Acceptable.	T2LF_27, 28
		G2	SE corner, crest to midslope.	7597338.840, 409574.231		8.0	0.1	0.05		Minor linear erosion.			T2LF_29
		G3	E crest, close to SE corner.	7597359.328, 409571.446		9.0	0.4	0.1		Minor linear erosion.			T2LF_44
		G4	E crest, close to SE corner.	7597363.606, 409571.165		7.5	0.2	0.05		Minor linear erosion.			T2LF_43
Erosion	Y	H1	S slope, near VT-8.	7597336.914, 409547.896	12 North	19.5	0.2	0.1	<1%	Minor linear erosion.	Longer than previously noted.	Acceptable.	T2LF_24, 35
		H2	S slope, near VT-8.	7597341.279, 409540.991		14	0.2	0.05					T2LF_24, 35
		H3	S slope midpoint.	7597339.417, 409527.001		22	0.3	0.15					T2LF_24, 37
		H4	S slope midpoint.	7597344.862, 409524.647		11	0.1	0.05					T2LF_24, 38
Erosion	Y	I1	W slope, crest to midslope.	7597376.543, 409476.030	12 North	8.0	0.3	0.25	<1%	Minor linear erosion.	Longer than previously noted.	Acceptable.	T2LF_12, 13
		I2	SW corner, midslope.	7597337.357, 409465.191		11	0.2	0.05					T2LF_19
Erosion	Y	J1	W slope close to NW corner.	7597398.392, 409471.916	12 North	16	0.2	0.05	<1%	Minor linear erosion.	Consistent.	Acceptable.	T2LF_9, 10
		J2		7597396.798, 409471.182		18	0.3	0.1					T2LF_9, 10
		J3		7597385.471, 409470.710		20	0.2	0.1					T2LF_11

Table 8-4: Visual Inspection Checklist –Tier II Soil Disposal Facility

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Northing/Easting/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Lateral Movement	N											
Frost Action	N											
Sloughing	N											
Cracking	N											
Animal Burrows	N											
Vegetation Establishment	Y	K1	Landfill cap near SW corner.	7597363.542, 409489.008	12 North	8m^2	NA	<1%	Sparse vegetation.	Smaller than previously noted.	Acceptable.	T2LF_20, 64
		K2	W slope.	7597395.251, 409455.378		2090m^2		~6%		Larger than previously noted.		T2LF_42, 64
		K3	W slope.	7597381.940, 409475.830		270m^2		<1%		NEW OBSERVATION.		T2LF_10, 11
		K4	SE corner and E slope.	7597366.783, 409588.565		1570m^2		~4%		Larger than previously noted.		T2LF_25, 26
Staining	N											
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	Y	VT-5	N crest.	7597408.914, 409506.727	12 North				Monuments.	Consistent.	Good exterior condition.	T2LF_60
		VT-6	N crest.	7597408.013, 409546.730								T2LF_56
		VT-7	S crest.	7597351.707, 409506.115								T2LF_39
		VT-8	S crest.	7597350.887, 409545.783								T2LF_33
		MW-9	N of landfill.	7597447.998, 409519.944								T2LF_1
		MW-10	SW of landfill.	7597315.631, 409449.718								T2LF_22
		MW-11	S of landfill.	7597306.678, 409521.050								T2LF_23
		MW-12	SE of landfill.	7597310.252, 409594.096								T2LF_28
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	N											

8.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Tier II Soil Disposal Facility was conducted on 16 August 2019 as per the TOR and the results are provided below.

Table 8-5: Preliminary Stability Assessment - Tier II Soil Disposal Facility.

Feature	Severity Rating	Extent
Settlement	Acceptable	Numerous
Erosion	Acceptable	Numerous
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Occasional
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

8.3.1.3 Photographic Records

The detailed photographic record for the Tier II Soil Disposal Facility has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record contains an index of photographs collected; full sized photographs are contained in the separately appended CD/DVD-ROM. **Figure PIN-3.7A** illustrates the photograph locations and directions.

8.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Tier II Soil Disposal Facility. The following table outlines the results of the visual trend analysis. Features where no significant change was noted are not listed here.

Table 8-6: Visual Inspection Trends - Tier II Soil Disposal Facility

Checklist Item	Feature ID	Comparison with Historical Observations
Settlement	A	Observed width has increased from 1.0 m in 2014 to 1.5 m in 2019.
	B1	Observed length has increased from 2.0 m in 2014 to 4.0 m in 2019.
	B2	Observed length has increased from 4.0 m in 2014 to 5.0 m in 2019.
	C3	Observed area has increased from 0.8 m^2 in 2014 to 14 m^2 in 2019.
	D1	Observed area has increased from 0.13 m^2 in 2014 to 3.6 m^2 in 2019.
	D2	Observed area has increased from 0.4 m^2 in 2014 to 1.5 m^2 in 2019.
Erosion	G1	Observed length and width have increased (range of measurements given in 2014).
	G2	Observed length has increased from 2014 to 2019 (range of measurements given in 2014).
	G3	Observed length has increased from 2014 to 2019 (range of measurements given in 2014).
	G4	Observed length has increased from 2014 to 2019 (range of measurements given in 2014).
	H1	Observed length has increased from 2014 to 2019 (range of measurements given in 2014).
	H3	Observed length has increased from 2014 to 2019 (range of measurements given in 2014).
	I1	Observed length has increased from 6.0 m in 2014 to 8.0 m in 2019.
	I2	Observed length has increased from 8.0 m in 2014 to 11.0 m in 2019.
Vegetation Establishment	K1	Coverage appears to have decreased since 2014 (no measurements previously given).
	K2	Coverage appears to have increased since 2014 (no measurements previously given).
	K3	New observation.
	K4	Coverage appears to have increased since 2014 (no measurements previously given).

8.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2019 monitoring events at the Tier II Soil Disposal Facility indicates that most existing settlement and erosion features increased in size (settlement features primarily increased in total area and erosion features increased primarily in length), though no new features of these types were observed. Vegetated areas (except for K1, which appears to have decreased in size) appear to be expanding; though there were no dimensions given from the 2014 program a comparison of observed areas against previous figures indicates larger areas in 2019. A new vegetated area, Feature K3, was observed. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

8.3.2 Soil Sampling

Soil sampling of the Tier II Soil Disposal Facility was conducted on August 16, 2019. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR and details are provided below in the following sections.

8.3.2.1 Laboratory Analytical Results

A total of nine soil samples (including one duplicate) were analysed from four soil sample locations at the Tier II Disposal Facility and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 6** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-3.7C** presents a summary of current and historical soil analytical results and is located at the end of this landfill section.

8.3.2.2 Discussion of Results – Comparison to Baseline/Background

The soil results for 2019 are presented in the following table. The background and baseline mean are presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 8-7: Evaluation of Results by Parameter – Tier II Soil Disposal Facility

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Arsenic (As)	1.0	1.0	**1.0**	Upgradient samples at surface and depth from MW-9 exceeded the BL+3SD at 1.4 and 1.5 mg/kg respectively. In addition, downgradient samples MW-10A surface and MW-12B depth exceeded the BL+3SD at 1.1 and 1.1 mg/kg respectively. However, all four exceedances were within 3 times the baseline mean. All remaining downgradient results were below the BL+3SD.
Cadmium (Cd)	1.0	1.0	**1.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Chromium (Cr)	20.0	20.0	**20.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Cobalt (Co)	5.0	5.0	**5.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Copper (Cu)	12.6	15.2	**47.9**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Lead (Pb)	10.0	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

Parameter	Background (mg/kg)	Baseline Mean (mg/kg)	Baseline Mean+3SD (mg/kg)	Discussion of Results
Nickel (Ni)	6.7	5.0	**10.3**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
Zinc (Zn)	16.4	15.0	**15.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
PCBs (Total)	0.1	0.1	**0.1**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F1 (C_6-C_{10})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F2 (C_{10}-C_{16})	N/A	10.0	**10.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.
F3 (C_{16}-C_{34})	N/A	50.0	**50.0**	The downgradient samples from MW-11 at surface exceeded the BL+3SD at 68 mg/kg but was within 3 times the baseline mean. All upgradient and remaining downgradient results were below the BL+3SD.
F4 (C_{34}-C_{50})	N/A	50.0	**50.0**	All soil sample results were below the BL+3SD at upgradient and downgradient locations.

8.3.2.3 Summary of Soil Trends

Trends in parameter concentrations in soil, based on data from eight monitoring events that took place between 2005 and 2019, are presented in the following table.

Table 8-8: Discussion of Trends – Tier II Soil Disposal Facility

Parameter	Discussion of Trends
Arsenic (As)	Arsenic has a no apparent trend for upgradient samples and a slight decreasing trend for downgradient samples.
Cadmium (Cd)	Cadmium appears to have a decreasing trend in both up and downgradient samples. However, the majority of results are below detection and the apparent trends are likely a function of changes in the detection limits.
Chromium (Cr)	Chromium has a very slight decreasing trend for both upgradient and downgradient samples.
Cobalt (Co)	Cobalt has a very slight decreasing trend for both upgradient and downgradient samples
Copper (Cu)	Copper appears to have no trend for both upgradient and downgradient samples.
Lead (Pb)	Lead has a decreasing trend for both the upgradient and downgradient samples but the upgradient trend is decreasing at a less steep rate.
Nickel (Ni)	Nickel has an increasing trend for upgradient samples and no apparent trend for downgradient samples. However, this upward trend is primarily due to the higher nickel concentrations detected during monitoring event 5 (2009) and 6 (2011) and it is worth noting that nickel concentrations in upgradient samples detected in monitoring event 10 (2014) and 15 (2019) have been below the baseline mean.

Parameter	Discussion of Trends
Zinc (Zn)	Zinc has no apparent trend for upgradient samples and a very slight decreasing trend for downgradient samples.
PCBs (Total)	PCBs appears to have an increasing trend in both up and downgradient samples. However, the majority of results are below detection and the apparent trends are primarily due to the higher detection limits reported for PCB results in 2011.
F1 (C_6-C_{10})	F1 appears to have a decreasing trend in both upgradient and downgradient samples. However, the majority of results are below detection and the apparent trends are likely a function of changes in the detection limits.
F2 (C_{10}-C_{16})	F2 appears to have a slight upward trend for upgradient samples and no apparent trend for downgradient samples. However, the majority of results are below detection and the apparent upward trend is likely due to the higher detection limits reported for PHC F2 results in 2014.
F3 (C_{16}-C_{34})	F3 appears to have a slight increasing trend for upgradient samples and a very slight decreasing trend for downgradient samples. However, the increasing trend in PHC F3 concentration in upgradient samples is primarily due to the higher detection limits reported in 2009 and 2014.
F4 (C_{34}-C_{50})	7 years of data is not available; therefore, no trend line analysis was conducted

The trends discussed in the previous table are presented on a series of graphs for each parameter in **Appendix G6**.

8.3.2.4 Discussion of Soil Results and Trends

All 2019 upgradient soil results for samples at surface and depth were below the BL+3SD for all parameters except arsenic. However, the arsenic concentrations were within 3 times the baseline mean and are therefore likely due to natural variability given that the baseline mean for arsenic was set to the analytical detection limit and no standard deviation was calculated.

Downgradient soil results in 2019 were above the BL+3SD for arsenic and PHC F3 at one or more locations or depths; however, the arsenic results were all within 3 times their respective baseline means, which could represent natural variability (as discussed above for arsenic). The PHC F3 result at the South Landfill that exceeded the BL+3SD of 50.0 mg/kg in 2019 was for the soil sample collected at surface from downgradient location MW-11. Based on the organic material observed in this sample and a review of the sample's PHC F2 and F3b concentrations, the PHC F3 exceedance detected is likely due to natural biogenic organic compounds. Accordingly, this PHC F3 exceedance is therefore not suspected to be an indication of contaminant migration from the landfill.

Data from seven monitoring events exist for the Tier II Disposal Facility, so trends in parameter concentrations were evaluated. Most parameters at this landfill appear to have decreasing or no apparent trend. In instances where increasing trends were observed, these trends appear to be due to changes in the detection limits. As such, the landfill seems to be performing well and there is no indication of contaminant migration from the landfill at this time based on the existing soil data

8.3.3 Groundwater Sampling

8.3.3.1 Monitoring Well Sampling/Inspection Logs

As per Section 5.3.3.2 of the TOR, groundwater monitoring logs were filled out for each monitoring well. Monitoring well sampling logs are presented in **Appendix D**.

8.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were measured and are presented in the following table.

Table 8-9: Summary of Groundwater Levels – Tier II Soil Disposal Facility

Monitoring Well ID	Monitoring Well Elevation (masl)	Water Level (mbtoc)	Well Stick up (m)	Water Level (mbgs)	Groundwater Elevation (masl)
MW-9	15.26	*	0.42	*	*
MW-10	10.88	1.942	0.82	1.12	8.94
MW-11	10.65	1.523	0.44	1.79	9.13
MW-12	10.96	1.775	0.67	1.11	9.19

Note: masl = metres above sea level, mbtoc = metre below top of casing, mbgs = metres below ground surface

Based on the available groundwater and land elevation data, groundwater flow is assumed to flow southwesterly. Groundwater elevations are presented on **Figure PIN-3.7D** located at the end of this landfill section. No groundwater contours are presented on **Figure PIN-3.7D** as the available data points are virtually situated along a line on the south side of the landfill and therefore do not provide the triangular positioning necessary for contour creation.

8.3.3.3 Groundwater Laboratory Analytical Results

A total of four groundwater samples (including one field duplicate) were collected at the Tier II Soil Disposal Facility and analysed for total inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc) and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

Current and historical analytical results are presented in **Table 6A** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-3.7D** presents a summary of current and historical groundwater analytical results and is located at the end of this landfill section.

8.3.3.4 Discussion of Groundwater Results

Groundwater results could only be obtained for the three downgradient wells at the landfill in 2019 as the groundwater in the upgradient monitoring well was frozen at the time of the field program. The groundwater results for 2014 are presented in the following table. The baseline mean is presented for information purposes. The discussions are focused on the comparison of the results to the BL+3SD.

Table 8-10: Evaluation of Groundwater Analytical Results – Tier II Soil Disposal Facility

Parameter	Baseline Mean (mg/L)	Baseline Mean+3SD (mg/L)	Discussion of Results
Arsenic (As)	0.0150	**0.0150**	All groundwater sample results were below the BL+3SD at downgradient locations.
Cadmium (Cd)	0.0010	**0.0010**	All groundwater sample results were below the BL+3SD at downgradient locations.
Chromium (Cr)	0.1105	**0.2102**	All groundwater sample results were below the BL+3SD at downgradient locations.
Cobalt (Co)	0.0210	**0.0295**	All groundwater sample results were below the BL+3SD at downgradient locations.
Copper (Cu)	0.3080	**0.6686**	All groundwater sample results were below the BL+3SD at downgradient locations.
Lead (Pb)	0.5275	**1.79**	All groundwater sample results were below the BL+3SD at downgradient locations.
Nickel (Ni)	0.0645	**0.1175**	All groundwater sample results were below the BL+3SD at downgradient locations.
Zinc (Zn)	0.5265	**2.02**	All groundwater sample results were below the BL+3SD at downgradient locations.
F1 (C_6-C_{10})	0.05	**0.05**	All groundwater sample results were below the BL+3SD at downgradient locations.
F2 (C_{10}-C_{16})	0.5	**0.5**	All groundwater sample results were below the BL+3SD at downgradient locations.
F3 (C_{16}-C_{34})	1	**1**	All groundwater sample results were below the BL+3SD at downgradient locations.
F4 (C_{34}-C_{50})	1	**1**	All groundwater sample results were below the BL+3SD at downgradient locations.

8.3.3.5 Summary of Groundwater Trend

Trends in parameter concentrations in groundwater, based on data from eight monitoring events that took place between 2005 and 2019, are presented in the following table. It is worth noting that there are no groundwater results for upgradient well MW-9 as this well has been dry or frozen during all monitoring events since 2005. In addition, downgradient monitoring well MW-10 has also been dry or frozen during most monitoring events.

Table 8-11: Evaluation of Groundwater Chemistry Trends – Tier II Soil Disposal Facility

Parameter	Discussion of Trends
Arsenic (As)	Arsenic appears to have a decreasing trend at downgradient locations

Parameter	Discussion of Trends
Cadmium (Cd)	Cadmium appears to have a decreasing trend at downgradient locations. However, the majority of results are below detection and the apparent trend is likely a function of changes in the detection limits.
Chromium (Cr)	Chromium has a slight increasing trend at downgradient locations. The increasing trend appears to be primarily due to the higher chromium concentrations detected in downgradient groundwater samples in 2009 and 2014. However, 2019 chromium concentrations were well below the chromium concentrations measured in 2009 and 2014.
Cobalt (Co)	Cobalt appears to have no apparent trend at downgradient locations.
Copper (Cu)	Copper appears to have no apparent trend at downgradient locations.
Lead (Pb)	Lead appears to have no apparent trend at downgradient locations.
Nickel (Ni)	Nickle appears to have no apparent trend at downgradient locations.
Zinc (Zn)	Zinc appears to have no apparent trend at downgradient locations.
F1 (C_6-C_{10})	7 years of data is not available; therefore, no trend line analysis was conducted
F2 (C_{10}-C_{16})	7 years of data is not available; therefore, no trend line analysis was conducted
F3 (C_{16}-C_{34})	7 years of data is not available; therefore, no trend line analysis was conducted
F4 (C_{34}-C_{50})	7 years of data is not available; therefore, no trend line analysis was conducted

The trends discussed in the previous table are presented on a series of graphs for each parameter in **Appendix H3**.

8.3.3.6 Discussion of Groundwater Results and Trends

Downgradient groundwater results for the Tier II Soil Disposal Facility were below the baseline mean and BL+3SD for all parameters in 2019. In addition, all parameters at downgradient groundwater locations appear to have decreasing or no trend except for chromium. Chromium concentrations in downgradient groundwater locations appear to have a slight upward trend. This trend is primarily due to the higher chromium concentrations detected in downgradient groundwater samples in 2009 and 2014. However, 2019 results indicate that chromium concentrations in all downgradient groundwater samples have dropped below the baseline mean. Based on this and given that chromium is the only parameter presenting a possible increasing trend, the existing groundwater data for the landfill does not indicate contaminant migration from the landfill at this time.

No upgradient groundwater results are available for the Tier II Disposal Facility as this landfill's upgradient well (MW-9) has been dry or frozen during all monitoring events since 2005. As such, there are no upgradient groundwater trends to assess at this landfill.

8.3.4 Thermal Monitoring

8.3.4.1 Thermistor Annual Maintenance Reports

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for thermistors as provided in **Appendix C**.

8.3.4.2 Summary of Findings from Annual DEW Line Thermal Reports

Raw thermistor data from our 2019 monitoring session was sent to DND for reference and review as part of the PIN-3 draft Field Progress report. No analysed thermistor data was provided to Arcadis for inclusion into the 2019 monitoring report.

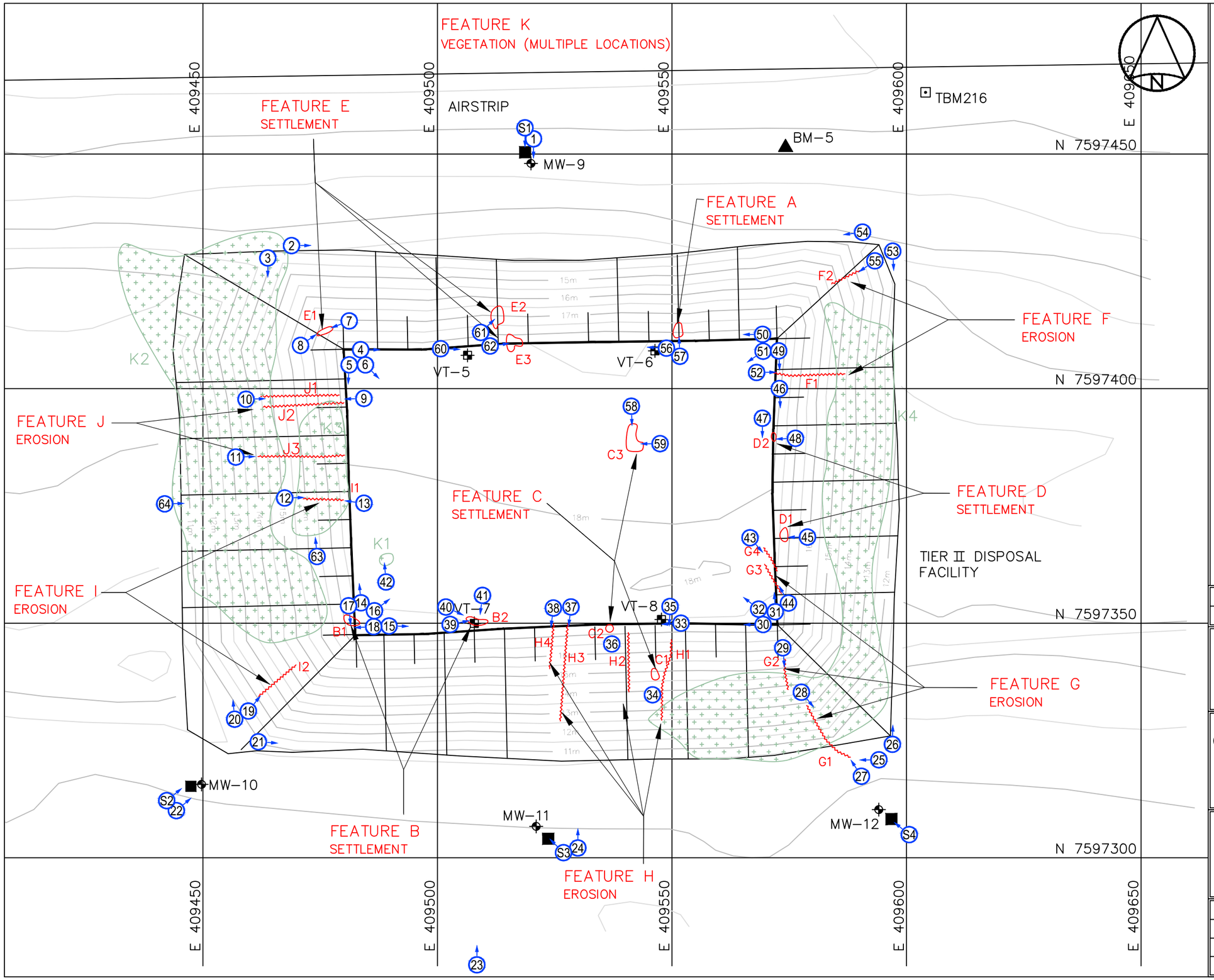
8.4 Overall Landfill Performance, Conclusions and Recommendations

Based on a review and analysis of the 2019 soil and groundwater data, the landfill appears to be performing as intended with no apparent indications of contaminant migration at this time.

It is recommended that the long-term monitoring of soil and groundwater continue as planned.

Based on the results of the visual inspection, the Tier II Soil Disposal Facility performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

Based on the results of the 2019 monitoring program, the overall performance of the Tier II Soil Disposal Facility is acceptable.



LEGEND

- TBM216 — TEMPORARY BENCHMARK
- BM-5 — PERMANENT BENCHMARK
- MW-12 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION
- SPARSE VEGETATION
- SETTLEMENT
- EROSION
- X — APPROX. PHOTOGRAPHIC VIEWPOINT (2019)

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NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

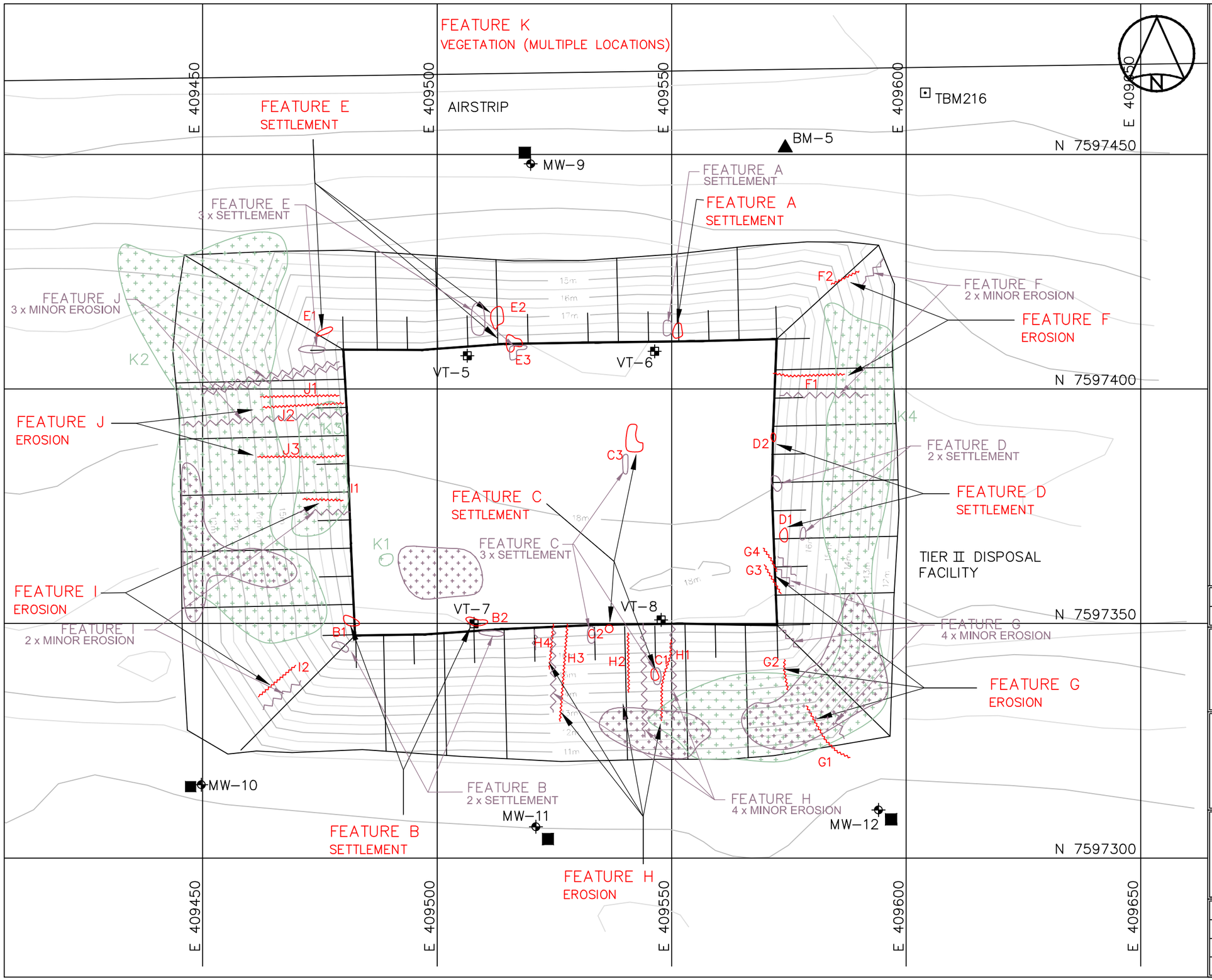
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

TIER II DISPOSAL FACILITY
2019 VISUAL INSPECTION

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MEASUREMENT UNIT	SCALE:	DATE: REVISED ON:
Meter	1 : 800	FEBRUARY 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: R. JANZEN	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-PIN-3.7	PAGE: PL

FIGURE PIN-3.7A



LEGEND

- TBM216 — TEMPORARY BENCHMARK
- BM-5 — PERMANENT BENCHMARK
- MW-12 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION
- SPARSE VEGETATION
- SETTLEMENT
- EROSION
- 2014 VISUAL INSPECTION OBSERVATIONS (FOR REFERENCE)

NOTE:
RED = 2019 FEATURES
PURPLE = 2014 FEATURES

Meters
15 0 15 30
1:800

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

TIER II DISPOSAL FACILITY
2019 & 2014 VISUAL INSPECTION

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE	DATE (YYYY-MM-DD)
Meter	1 : 800	FEBRUARY 2020
DRAWN BY: R. FLETCHER	VERIFIED BY: R. JANZEN	APPROVED BY: C. GRAVELLE, P.ENG
PROJECT NO: 30000251	DRAWING NO: 30000251-PIN-3.7	PAGE: PL

FIGURE PIN-3.7B



Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-10 surface - downgradient																		
05-26684	MW-10	2005	1	Phase I	0	**1.5**	<1	<20	<5	**33.6**	<10	**5.1**	<15	<0.003	**11**	6.4	34	22
TP-11	MW-10	2006	2	Phase I	10	**1.04**	<0.5	3.7	<2	6.8	<2	<5	4.5	<0.01	<10	<5	9	10
P3-MW-10-1	MW-10	2007	3	Phase I	10	0.891	<0.5	5.9	2.2	11.9	<30	<5	7.2	<0.01	<10	<5	29	17
P3-MW-10A	MW-10	2008	4	Phase I	10	<5	<0.5	4.7	2.1	**20.5**	**11.7**	**5.4**	13.0	<0.05	<10	<30	**57**	N/A
P309-10WA	MW-10	2009	5	Phase I	0-15	**4.0**	<0.1	15.0	2.0	8.0	2.0	**9.0**	<10	<0.01	<12	<10	21	<10
SS11-050	MW-10	2011	7	Phase II	0-15	<2	<0.1	16.2	2.4	5.1	<5	**10.8**	10.1	<0.45	<5	N/A	N/A	N/A
SS11-071 (Dup)	MW-10	2011	7	Phase II	0-15	<2	<0.1	13.8	2.1	5.1	<5	**8.4**	8.8	<0.45	<5	N/A	N/A	N/A
P314-10WA	MW-10	2014	10	Phase II	0-15	1.0	0.1	4.2	1.7	**56.5**	<4.9	**8.2**	5.0	<0.10	<10	<50	**52**	<100
MW-10A	MW-10	2019	15	Phase II	0-15	**1.1**	<0.050	4.5	2.0	7.1	1.4	3.6	5.3	<0.010	<3.5	<3.0	19	<4.7
MW-10 depth - downgradient																		
05-26686	MW-10	2005	1	Phase I	30	**2.3**	<1	<20	<5	7.4	<10	<5	<15	<0.003	<10	5.4	<9	<8
TP-12	MW-10	2006	2	Phase I	50	**1.43**	<0.5	6.8	3.3	11.8	2.1	**6.2**	10.7	<0.01	<10	<5	10	<5
P3-MW-10-2	MW-10	2007	3	Phase I	50	**1.09**	<0.5	5.2	2.3	9.8	<30	<5	6.6	<0.01	<10	<5	14	<5
P3-MW-10B	MW-10	2008	4	Phase I	50	<5	<0.5	4.8	2.2	8.4	<2	<5	4.2	<0.05	<10	<30	<50	N/A
P309-10WB	MW-10	2009	5	Phase I	40-50	**3.0**	<0.1	9.0	2.0	<5	1.0	**6.0**	<10	<0.01	<12	**12**	25	<10
SS11-051	MW-10	2011	7	Phase II	40-50	<2	<0.1	6.3	1.9	4.9	<5	**5.6**	9.5	<0.45	<5	N/A	N/A	N/A
SS11-072 (Dup)	MW-10	2011	7	Phase II	40-50	<2	<0.1	18.6	2.0	6.1	<5	**10.7**	8.6	<0.45	<5	N/A	N/A	N/A
P314-10WB	MW-10	2014	10	Phase II	40-50	**1.1**	<0.01	3.3	2.1	4.3	<5	2.9	4.0	<0.10	<10	<50	<50	<100
MW-10B	MW-10	2019	15	Phase II	40-50	<1.0	<0.050	3.2	1.5	6.5	1.1	2.8	4.1	<0.010	<3.5	<3.0	14	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-11 surface - downgradient																		
05-26676	MW-11	2005	1	Phase I	0	**1.1**	<1	<20	<5	6.0	<10	<5	<15	<0.003	<10	<4	45	32
TP-13	MW-11	2006	2	Phase I	10	0.934	<0.5	4.8	<2	12.9	2.1	<5	10.2	<0.02	<10	<5	50	**74**
TP-19 (Interlab)	MW-11	2006	2	Phase I	10	0.7	0.2	6.0	1.8	**17.5**	5.6	**18.1**	5.0	<0.10	<10	<50	<50	<50
P3-MW-11-1	MW-11	2007	3	Phase I	10	0.679	<0.5	4.6	2.0	4.9	<30	<5	5.4	<0.01	<10	**13**	41	23
P3-MW-11A	MW-11	2008	4	Phase I	10	<5	<0.5	3.8	<2	4.7	<2	<5	4.2	<0.05	<10	<30	<50	N/A
P309-11WA	MW-11	2009	5	Phase I	0-15	1.0	<0.1	3.0	1.0	7.0	<1	3.0	<10	<0.01	<12	<10	28	11
SS11-048	MW-11	2011	7	Phase II	0-15	<2	<0.1	**22.9**	3.7	7.6	<5	**12.1**	**46.9**	<0.45	<5	N/A	N/A	N/A
SS11-073 (Dup)	MW-11	2011	7	Phase II	0-15	<2	<0.1	6.4	1.6	4.3	<5	4.9	8.6	<0.45	<5	N/A	N/A	N/A
P314-11WA	MW-11	2014	10	Phase II	0-15	0.7	0.02	2.8	1.5	**15.9**	<4.9	3.4	4.0	<0.10	<10	<50	<50	<100
MW-11A	MW-11	2019	15	Phase II	0-15	<1.0	<0.050	4.4	1.8	11	7.3	3.6	9.3	<0.010	<3.5	4.8	**68**	17
MW-11 depth - downgradient																		
05-26678	MW-11	2005	1	Phase I	30	**1.3**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	10	<8
TP-14	MW-11	2006	2	Phase I	50	0.865	<0.5	4.5	<2	6.1	<2	<5	6.7	<0.01	<10	<5	<5	<5
TP-20 (Interlab)	MW-11	2006	2	Phase I	50	**1.3**	<0.05	7.0	2.4	7.0	2.4	**17.7**	7.0	<0.10	<10	<50	<50	<50
P3-MW-11-2	MW-11	2007	3	Phase I	50	0.904	<0.5	4.7	2.3	7.4	<30	<5	7.1	<0.01	<10	<5	<5	<5
P3-18-2 (Dup)	MW-11	2007	3	Phase I	50	0.777	<0.5	4.6	<2	7.0	<30	<5	5.0	<0.05	<10	<5	<5	12
P3-18-2 (Interlab)	MW-11	2007	3	Phase I	50	<10	<0.5	3.0	2.0	6.0	<5	3.0	5.0	<0.03	<5	<80	<250	N/A
P3-MW-11B	MW-11	2008	4	Phase I	50	<5	<0.5	4.0	<2	5.0	<2	<5	5.1	<0.05	<10	<30	<50	N/A
P309-11WB	MW-11	2009	5	Phase I	40-50	**4.0**	<0.1	3.0	2.0	<5	1.0	5.0	<10	<0.01	<12	<10	22	<10
SS11-049	MW-11	2011	7	Phase II	40-50	<2	<0.1	<5	1.0	2.3	<5	2.3	6.6	<0.45	<5	N/A	N/A	N/A
SS11-074 (Dup)	MW-11	2011	7	Phase II	40-50	<2	<0.1	<5	1.3	3.7	<5	3.4	7.6	<0.45	<5	N/A	N/A	N/A
P314-11WB	MW-11	2014	10	Phase II	40-50	0.9	<0.01	4.4	2.5	4.5	<5	3.8	9.0	<0.10	<10	<50	<50	<100
P314-BD6 (Dup)	MW-11	2014	10	Phase II	40-50	0.9	<0.01	4.1	1.9	4.4	<4.9	3.2	4.0	<0.10	<10	<50	<50	<100
P314-11WB (Interlab)	MW-11	2014	10	Phase II	40-50	**1.1**	<0.1	**22.0**	2.0	<5	1.5	**11.0**	<10	<0.01	<12	<10	<50	N/A
MW-11B	MW-11	2019	15	Phase II	40-50	<1.0	<0.050	3.8	1.6	6.6	1.2	3.0	4.8	<0.010	<3.5	<3.0	9.7	<4.7

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-9 surface - upgradient																		
05-26680	MW-9	2005	1	Phase I	0	**1.4**	<1	<20	<5	**18.0**	<10	<5	<15	0.0033	<10	6.8	9.1	<8
TP-9	MW-9	2006	2	Phase I	10	**1.52**	<0.5	6.3	2.8	9.1	3.3	<5	9.9	<0.01	<10	<5	<5	<5
P3-MW-9-1	MW-9	2007	3	Phase I	10	**1.31**	<0.5	5.7	2.8	10.0	<30	<5	9.0	<0.01	<10	<5	20	<5
P3-MW-9A	MW-9	2008	4	Phase I	10	<5	<0.5	6.8	2.5	8.4	3.2	<5	4.7	<0.05	<10	<30	<50	N/A
P309-9WA	MW-9	2009	5	Phase I	0-15	<1	<0.1	9.0	2.0	6.0	2.0	**9.0**	<10	<0.01	<12	<10	27	11
SS11-042	MW-9	2011	7	Phase II	0-15	<2	<0.1	**20.7**	3.2	9.3	<5	**14.5**	**15.6**	<0.45	<5	N/A	N/A	N/A
P314-9WA	MW-9	2014	10	Phase II	0-15	**1.4**	0.01	7.1	2.8	7.2	<4.9	3.7	7.0	<0.10	<10	<50	<50	<100
MW-9A	MW-9	2019	15	Phase II	0-15	**1.4**	<0.050	4.9	2.3	13	3.1	4.2	6.9	<0.010	<3.5	3.5	24	6.9
MW-9 depth - upgradient																		
05-26682	MW-9	2005	1	Phase I	30	**1.4**	<1	<20	<5	12.4	<10	<5	<15	0.0038	<10	<4	14	8
TP-10	MW-9	2006	2	Phase I	50	**1.53**	<0.5	5.3	2.8	10.3	3.1	<5	10.8	<0.01	<10	<5	<5	<5
P3-MW-9-2	MW-9	2007	3	Phase I	50	**1.57**	<0.5	5.8	3.1	14.0	<30	**5.2**	**16.4**	<0.01	<10	<5	31	21
P3-MW-9B	MW-9	2008	4	Phase I	50	<5	<0.5	5.4	2.7	10.0	3.8	<5	5.3	<0.05	<10	<30	<50	N/A
P309-9WB	MW-9	2009	5	Phase I	40-50	<1	<0.1	**27.0**	4.0	14.0	2.0	**21.0**	<10	<0.01	<12	<10	14	<10
S11-044	MW-9	2011	7	Phase II	40-50	<2	<0.1	**31.7**	3.3	8.8	<5	**19.6**	13.8	<0.45	<5	N/A	N/A	N/A
P314-9WB	MW-9	2014	10	Phase II	40-50	**1.4**	<0.01	5.0	2.9	7.0	<5	3.9	6.0	<0.10	<10	<50	<50	<100
MW-9B	MW-9	2019	15	Phase II	40-50	**1.5**	<0.050	5.5	2.3	**21**	7.4	4.6	11	<0.010	<3.5	3.2	48	13

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-12 surface - downgradient																		
05-26672	MW-12	2005	1	Phase I	0	**2.8**	<1	<20	<5	**25.3**	<10	**7.3**	**21.9**	<0.003	**17**	**16**	**740**	**410**
TP-15	MW-12	2006	2	Phase I	10	**1.5**	<0.5	6.0	3.2	11.0	3.8	**5.6**	9.8	<0.01	<10	<5	16	14
P3-MW-12-1	MW-12	2007	3	Phase I	10	**1.63**	<0.5	5.8	<2	**21.6**	<30	<5	**27.7**	<0.01	<10	<5	**190**	**230**
P3-MW-12A	MW-12	2008	4	Phase I	10	<5	<0.5	5.3	3.1	**41.9**	**22.4**	**7.5**	**18.9**	<0.090	<10	<30	**77**	N/A
P309-12WA	MW-12	2009	5	Phase I	0-15	1.0	<0.1	3.0	1.0	**16.0**	1.0	4.0	<10	<0.01	<12	<10	35	11
SS11-045	MW-12	2011	7	Phase II	0-15	<2	<0.1	10.5	2.3	9.2	<5	**7.3**	13.1	<0.45	<5	N/A	N/A	N/A
P314-12WA	MW-12	2014	10	Phase II	0-15	**1.5**	0.12	4.3	1.9	**71.6**	<4.9	**9.1**	8.0	<0.10	<10	<50	<50	<100
MW-12A	MW-12	2019	15	Phase II	0-15	<1.0	<0.050	3.1	1.3	6.3	1.1	2.7	3.7	<0.010	<3.5	<3.0	8.4	<4.7
MW-12 depth - downgradient																		
05-26674	MW-12	2005	1	Phase I	30	**1.5**	<1	<20	<5	6.7	<10	**5.2**	<15	<0.003	<10	<4	10	12
TP-16	MW-12	2006	2	Phase I	50	**1.19**	<0.5	7.8	3.4	8.8	2.2	**6.1**	10.5	<0.01	<10	<5	<5	<5
P3-MW-12-2	MW-12	2007	3	Phase I	50	**1.03**	<0.5	4.3	2.1	6.4	<30	<5	6.0	<0.01	<10	<5	<5	<5
P3-MW-12B	MW-12	2008	4	Phase I	50	<5	<0.5	7.5	3.1	**16.2**	2.6	<5	6.5	<0.05	<10	<30	<50	N/A
P309-12WB	MW-12	2009	5	Phase I	40-15	**3.0**	<0.1	5.0	2.0	6.0	2.0	5.0	<10	<0.01	<12	<10	26	<10
SS11-047	MW-12	2011	7	Phase II	40-50	<2	<0.1	15.1	2.8	10.6	<5	**10.6**	13.5	<0.45	<5	N/A	N/A	N/A
P314-12WB	MW-12	2014	10	Phase II	40-50	0.9	<0.01	3.8	2.7	10.7	<4.9	3.6	6.0	<0.10	<10	<50	<50	<100
MW-12B	MW-12	2019	15	Phase II	40-50	**1.1**	<0.050	4.5	2.2	13.0	1.3	4.0	6.5	<0.010	<3.5	<3.0	12	<4.7
MW-17B (Dup)	MW-12	2019	15	Phase II	40-50	<1.0	<0.050	3.9	2.0	12	1.2	4.0	5.7	<0.010	<3.5	3.0	19	<4.7

PIN-3 Tier II Disposal Facility	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
Background Data - Arithmetic Mean	1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**1.0**	**1.0**	**20.0**	**5.0**	**15.2**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Baseline Data - Standard Deviation	0.0	0.0	0.0	0.0	10.9	0.0	1.8	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation	**1.0**	**1.0**	**20.0**	**5.0**	**47.9**	**10.0**	**10.3**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

- TBM216 — TEMPORARY BENCHMARK
- BM–5 — PERMANENT BENCHMARK
- MW–12 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
15 0 15 30
1:800

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	*RF*	*RJ*	*CG*

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

TIER II DISPOSAL FACILITY
2019 SOIL ANALYTICAL RESULTS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE/TIME OF PLOT:
Meter	1 : 800	FEBRUARY 2020
DRAWN BY: *R. FLETCHER*	VERIFIED BY: *R. JANZEN*	APPROVED BY: *C. GRAVELLE, P.ENG*
PROJECT NO: 30000251	DRAWING NO: 30000251-PIN-3.7	PAGE PL

FIGURE PIN-3.7C

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Upgradient - MW-9																
Not sampled - dry/frozen	MW-9	2005	1	Phase I												
Not sampled - dry/frozen	MW-9	2006	2	Phase I												
Not sampled - dry/frozen	MW-9	2007	3	Phase I												
Not sampled - dry/frozen	MW-9	2008	4	Phase I												
Not sampled - dry/frozen	MW-9	2009	5	Phase I												
Not sampled - dry/frozen	MW-9	2011	7	Phase II												
Not sampled - dry/frozen	MW-9	2014	10	Phase II												
Not sampled - dry/frozen	MW-9	2019	15	Phase II												

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-12																
Not sampled - insufficient volume	MW-12	2005	1	Phase I												
MW-9	MW-12	2006	2	Phase I	<0.0050	0.000087	<0.0050	<0.0015	<0.0050	<0.0025	0.0067	<0.0250	<0.1	<0.25	<0.25	N/A
P3-MW-12	MW-12	2007	3	Phase I	<0.0050	<0.00017	0.0100	<0.0030	<0.010	<0.0050	0.0140	<0.0500	<0.1	N/A	N/A	N/A
P3-MW-12	MW-12	2008	4	Phase I	<0.0050	<0.00025	<0.0025	<0.0025	<0.0050	<0.0050	<0.025	<0.0050	<0.1	N/A	N/A	N/A
P309-12W	MW-12	2009	5	Phase I	0.0090	0.0004	**0.1500**	0.0070	0.0950	0.1000	0.0570	0.5000	<0.1	<0.1	<0.1	N/A
WS11-012	MW-12	2011	7	Phase II	<0.0010	<0.00050	<0.0200	0.0010	<0.0020	<0.0010	0.0210	0.0800	<0.5	N/A	N/A	N/A
WS11-013 (Dup)	MW-12	2011	7	Phase II	<0.0010	<0.00050	<0.0200	0.0010	<0.0020	<0.0010	0.0210	0.0800	<0.5	N/A	N/A	N/A
WS11-012 (Interlab)	MW-12	2011	7	Phase II	0.0003	0.000013	0.0010	0.0005	0.0018	0.0003	0.0049	<0.0030	<0.1	<0.1	<0.1	<0.1
P314-12W	MW-12	2014	10	Phase II	0.0135	0.00002	**0.2030**	0.0158	0.1380	0.1250	**0.1150**	0.2710	<0.2	<0.2	<0.1	<0.1
MW-12	MW-12	2019	15	Phase II	0.00031	<0.000020	0.0047	<0.00030	0.0037	0.0040	0.0046	0.0130	0.038	<0.020	<0.043	<0.055
MW-17	MW-17	2019	15	Phase II	0.00035	<0.000020	0.0045	0.00031	0.0035	0.0040	0.0045	0.013	0.032	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-11																
Not sampled - insufficient volume	MW-11	2005	1	Phase I												
MW-5	MW-11	2006	2	Phase I	<0.0050	<0.000085	0.0127	<0.0015	<0.0050	0.0035	0.0052	0.0280	<0.1	<0.25	<0.25	N/A
MW-6 (Dup)	MW-11	2006	2	Phase I	<0.0070	<0.00017	<0.0100	<0.0030	<0.0100	<0.0050	<0.010	0.0540	<0.1	<0.25	<0.25	N/A
MW-7 (Interlab)	MW-11	2006	2	Phase I	<0.0010	0.00005	<0.0010	0.0007	0.0017	0.0030	<0.0080	0.0410	<0.1	<0.08	<0.08	N/A
P3-MW-11	MW-11	2007	3	Phase I	<0.0250	<0.00085	<0.0500	<0.0150	<0.0500	<0.0250	<0.0500	<0.25	<0.1	N/A	N/A	N/A
P3-MW-18 (Dup)	MW-11	2007	3	Phase I	<0.0250	<0.00085	<0.0500	<0.0150	<0.0500	<0.0250	<0.0500	<0.25	<0.1	N/A	N/A	N/A
P3-MW-18 (Interlab)	MW-11	2007	3	Phase I	0.0030	<0.0002	0.0020	<0.001	0.0040	0.0010	0.0030	0.0120	N/A	<0.1	<0.25	<0.25
P3-MW-11	MW-11	2008	4	Phase I	<0.0050	<0.00025	<0.0025	<0.0025	0.0056	<0.0050	<0.0250	0.0295	<0.1	N/A	N/A	N/A
P309-11W	MW-11	2009	5	Phase I	0.0030	0.00078	0.0420	0.0067	**0.4800**	**2.30**	0.0280	**0.6100**	<0.1	<0.1	<0.1	N/A
WS11-011	MW-11	2011	7	Phase II	<0.0010	<0.00050	0.0600	<0.0010	0.0080	0.0320	0.0100	0.0600	<0.5	N/A	N/A	N/A
P314-11W	MW-11	2014	10	Phase II	0.0118	0.00014	**0.4080**	0.0108	0.2410	**0.9960**	**0.0655**	0.2890	<0.2	0.20	0.20	0.70
MW-11	MW-11	2019	15	Phase II	0.00037	<0.000020	0.0085	<0.00030	0.0078	0.0085	0.0023	0.014	0.032	<0.020	<0.043	<0.055

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Downgradient - MW-10																
Not sampled - dry/frozen	MW-10	2005	1	Phase I												
Not sampled - dry/frozen	MW-10	2006	2	Phase I												
Not sampled - dry/frozen	MW-10	2007	3	Phase I												
Not sampled - dry/frozen	MW-10	2008	4	Phase I												
Not sampled - dry/frozen	MW-10	2009	5	Phase I												
Not sampled - dry/frozen	MW-10	2011	7	Phase II												
Not sampled - dry/frozen	MW-10	2014	10	Phase II												
MW-10	MW-10	2019	15	Phase II	0.00021	<0.000020	<0.0010	<0.00030	0.0032	0.0010	0.0013	0.012	0.041	<0.020	<0.043	<0.055

PIN-3 Tier II Disposal Facility	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Baseline Data - Arithmetic Mean	0.0150	0.0005	0.1105	0.0210	0.3080	0.5275	0.0645	0.5265	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit	**0.0150**	**0.0010**	**0.1105**	**0.0210**	**0.3080**	**0.5275**	**0.0645**	**0.5265**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation	0.0000	0.0000	0.0332	0.0028	0.1202	0.4207	0.0177	0.4971	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation	**0.0150**	**0.0010**	**0.2102**	**0.0295**	**0.6686**	**1.79**	**0.1175**	**2.02**	**0.05**	**0.5**	**1.0**	**1.0**

If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.

E 409550
E 409600
E 409650
N 7597450
N 7597400
N 7597350
N 7597300
E 409450
E 409500
TBM216
BM–5
MW–9
FROZEN
VT–5
VT–6
VT–7
VT–8
MW–10
8.94
9.13
MW–11
MW–12
9.19
TIER II DISPOSAL FACILITY
15m
16m
17m
18m
14m
13m
12m
11m

LEGEND

- TBM216 — TEMPORARY BENCHMARK
- BM–5 — PERMANENT BENCHMARK
- MW–12 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION
- INTERPRETED GROUNDWATER FLOW DIRECTION
- 7.72 — GROUNDWATER ELEVATION (masl)

Legend for Tables	
XX	sample exceeds baseline mean
XX	sample exceeds baseline mean + 3x SD
N/A	not analyzed

Meters
15 0 15 30
1:800

NO.	VERSION	DATE	BY	VERIF.	APPR.
2	FINAL	2020.02.28	RF	RJ	CG

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-3, LADY FRANKLIN POINT (NUNAVUT)

TIER II DISPOSAL FACILITY
2019 GROUNDWATER ANALYTICAL RESULTS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 800	FEBRUARY 2020
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	R. JANZEN	C. GRAVELLE, P.ENG
PROJECT NO:	DRAWING NO:	PAGE
30000251	30000251-PIN-3.7	PL

FIGURE PIN-3.7D

TABLES

TABLE 1

PIN-3 Main Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**12.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**15.7**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.00	0.0	0.0	13.2	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**46.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**55.4**	**50.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	MW-5 surface																	
05-26652	MW-5	2005	1	Phase I	0	**2.0**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6.8	**18**	11
TP-1	MW-5	2006	2	Phase I	10	**1.06**	<0.5	5.7	2.4	10.9	3.8	<5	8.1	<0.01	<10	<5	<5	<5
P3-MW-5-1	MW-5	2007	3	Phase I	10	0.508	<0.5	3.9	<2	11.8	<30	<5	5.8	<0.01	<10	**26**	**180**	**180**
P3-17-1 (Dup)	MW-5	2007	3	Phase I	10	**1.53**	<0.5	5.8	3.1	6.7	<30	<5	9.6	<0.05	<10	<5	9	26
P3-17-1 (Interlab)	MW-5	2007	3	Phase I	10	<10	<0.5	5.0	3.0	4.0	<5	4.0	8.0	<0.03	<5	<80	<250	N/A
P3-MW-5A	MW-5	2008	4	Phase I	10	<5	<0.5	6.0	3.0	7.0	3.8	<5	5.8	<0.05	<10	<30	<50	N/A
P309-5WA	MW-5	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	<5	1.0	2.0	<10	<0.01	<12	10	**22**	<10
SS11-031	MW-5	2011	7	Phase II	0-15	<2	<0.1	16.9	3.6	7.8	<5	**12.0**	**15.3**	<0.45	<5	N/A	N/A	N/A
P314-5WA	MW-5	2014	10	Phase II	0-15	**1.4**	0.01	4.7	2.4	4.8	<5	3.0	8.0	<0.10	<10	<50	<50	<100
MW-5A	MW-5	2019	15	Phase II	0-15	<1.0	<0.050	4.9	2.0	6.2	1.9	3.4	6.9	<0.010	<3.5	<3.0	12	<4.7
	MW-5 depth																	
05-26654	MW-5	2005	1	Phase I	30	**1.4**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6	<9	<8
TP-2	MW-5	2006	2	Phase I	50	0.955	<0.5	3.4	<2	3.8	<2	<5	6.9	<0.01	<10	<5	<5	<5
P3-MW-5-2	MW-5	2007	3	Phase I	50	0.841	<0.5	4.8	2.7	**16.8**	<30	<5	7.9	<0.05	<10	<5	**22**	17
P3-MW-5B	MW-5	2008	4	Phase I	50	<5	<0.5	5.4	2.2	4.7	2.5	N/A	5.9	<0.05	<10	<30	<50	N/A
P309-5WB	MW-5	2009	5	Phase I	40-50	<1	<0.1	2.0	<1	<5	1.0	2.0	<10	<0.01	<12	<10	14	<10
SS11-032	MW-5	2011	7	Phase II	40-50	<2	<0.1	18.6	2.3	6.9	<5	**11.3**	14.0	<0.45	<5	N/A	N/A	N/A
P314-5WB	MW-5	2014	10	Phase II	40-50	0.9	<0.01	6.3	2.1	3.9	<5	3.3	6.0	<0.10	<10	<50	<50	<100
MW-5B	MW-5	2019	15	Phase II	40-50	**1.2**	<0.050	4.5	1.6	5.7	1.5	2.8	5.7	<0.010	<3.5	<3.0	13	<4.7

TABLE 1

PIN-3 Main Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**12.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**15.7**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.00	0.0	0.0	13.2	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**46.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**55.4**	**50.0**
Downgradient																		
	MW-6 surface																	
05-26648	MW-6	2005	1	Phase I	0	<1	<1	<20	<5	**12.0**	<10	<5	<15	<0.003	<10	5	14	<8
05-26649 (Dup)	MW-6	2005	1	Phase I	0	**1.8**	<1	<20	<5	8.8	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-3	MW-6	2006	2	Phase I	10	0.795	<0.5	5.6	2.1	7.5	<2	<5	7.4	<0.01	<10	<5	**18**	6
TP-17 (Dup)	MW-6	2006	2	Phase I	10	0.705	<0.5	4.1	2.1	4.1	<2	<5	6.7	<0.01	<10	<5	<5	<5
P3-MW-6-1	MW-6	2007	3	Phase I	10	0.949	<0.5	6.2	2.4	**12.0**	<30	**6.0**	8.0	<0.01	<10	N/A	**170**	48
P3-MW-6A	MW-6	2008	4	Phase I	10	<5	<0.5	5.2	2.3	6.2	<2	<5	5.4	<0.05	<10	<30	<50	N/A
P309-6WA	MW-6	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	5.0	<1	3.0	<10	<0.01	<12	<10	**25**	11
SS11-022	MW-6	2011	7	Phase II	0-15	<2	<0.1	**21.7**	2.6	6.5	<5	**13.8**	13.8	<0.45	<5	N/A	N/A	N/A
SS11-023 (Interlab)	MW-6	2011	7	Phase II	0-15	<1	<0.1	6.0	2.0	6.0	1.0	**6.0**	<10	<0.01	<12	<10	<10	<10
P314-6WA	MW-6	2014	10	Phase II	0-15	0.9	0.02	6.0	3.3	**14.1**	<5	**6.1**	8.0	<0.10	<10	<50	<50	<100
MW-6A	MW-6	2019	15	Phase II	0-15	<1.0	<0.050	4.5	2.1	8.4	1.4	4.2	6.7	<0.010	<3.5	<3.0	**17**	<4.7
	MW-6 depth																	
05-26650	MW-6	2005	1	Phase I	30	**1.1**	<1	<20	<5	6.6	<10	<5	<15	<0.003	<10	5	<9	<8
TP-4	MW-6	2006	2	Phase I	50	0.983	<0.5	5.3	2.6	11.1	<2	**5.4**	8.6	<0.018	<10	9	**19**	<5
TP-18 (Dup)	MW-6	2006	2	Phase I	50	0.881	<0.5	4.9	2.5	10.8	<2	<5	7.9	<0.01	<10	5	**18**	23
P3-MW-6-2	MW-6	2007	3	Phase I	50	**3.15**	0.55	5.4	3.2	**19.2**	<30	**8.0**	9.3	<0.01	<10	<5	15	12
P3-MW-6B	MW-6	2008	4	Phase I	50	<5	<0.5	7.8	3.8	10.0	<2	**6.3**	7.9	<0.05	<10	<30	<50	N/A
P309-6WB	MW-6	2009	5	Phase I	40-50	<1	<0.1	3.0	2.0	7.0	<1	3.0	<10	<0.01	<12	<10	**18**	<10
P309-BD2 (Dup)	MW-6	2009	5	Phase I	40-50	**2.0**	<0.1	3.0	2.0	9.0	1.0	4.0	<10	<0.01	<12	<10	11	<10
SS11-024	MW-6	2011	7	Phase II	40-50	<2	<0.1	**43.4**	3.3	6.0	<5	**23.8**	14.1	<0.45	<5	N/A	N/A	N/A
P314-6WB	MW-6	2014	10	Phase II	40-50	0.8	<0.01	4.0	3.2	**14.2**	<5	4.6	6.0	<0.10	<10	<50	<50	<100
P314-BD1 (Dup)	MW-6	2014	10	Phase II	40-50	0.9	0.01	4.6	2.7	8.6	<4.9	4.0	7.0	<0.10	<10	<50	<50	<100
P314-6WB (Interlab)	MW-6	2014	10	Phase II	40-50	**5.9**	0.26	**21.0**	**6.3**	**15.0**	**37.0**	**27.0**	**130.0**	<0.01	<12	<10	<50	N/A
MW-6B	MW-6	2019	15	Phase II	40-45	<1.0	<0.050	4.6	2.0	11.0	1.2	3.9	6.3	<0.010	<3.5	<3.0	9.1	<4.7

TABLE 1

PIN-3 Main Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**12.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**15.7**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.00	0.0	0.0	13.2	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**46.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**55.4**	**50.0**
Downgradient																		
	MW-7 surface																	
05-26644	MW-7	2005	1	Phase I	0	<1	<1	<20	<5	7.5	<10	<5	<15	<0.003	<10	<4	<9	<8
05-26645 (Dup)	MW-7	2005	1	Phase I	0	<1	<1	<20	<5	8.5	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-5	MW-7	2006	2	Phase I	10	**1.3**	<0.5	6.1	2.9	10.2	2.5	<5	10.0	<0.01	<10	<5	8	<5
P3-MW-7-1	MW-7	2007	3	Phase I	10	**1.31**	<0.5	6.8	2.6	11.5	<30	<5	9.5	<0.01	<10	<5	**24**	17
P3-MW-7A	MW-7	2008	4	Phase I	10	<5	<0.5	5.1	2.1	10.3	2.1	<5	5.3	<0.05	<10	<30	<50	N/A
P3-MW-7B (Dup)	MW-7	2008	4	Phase I	15	<5	<0.5	6.8	2.5	**12.1**	2.5	<5	7.5	<0.05	<10	<30	<50	N/A
P309-7WA	MW-7	2009	5	Phase I	0-15	<1	<0.1	4.0	2.0	5.0	1.0	4.0	<10	<0.01	<12	<10	15	<10
SS11-025	MW-7	2011	7	Phase II	0-15	<2	<0.1	18.5	3.4	10.4	<5	**13.4**	**17.5**	<0.45	<5	N/A	N/A	N/A
P314-7WA	MW-7	2014	10	Phase II	0-15	**2.0**	<0.01	4.5	2.0	7.2	<5	3.4	8.0	<0.10	<10	<50	<50	<100
MW-7A	MW-7	2019	15	Phase II	0-15	<1.0	<0.050	5.2	2.4	9.6	1.8	4.6	8.7	<0.010	<3.5	<3.0	12	<4.7
	MW-7 depth																	
05-26646	MW-7	2005	1	Phase I	30	<1	<1	<20	<5	8.6	<10	<5	<15	<0.003	<10	4	13	<8
05-26647 (Dup)	MW-7	2005	1	Phase I	30	<1	<1	<20	<5	7.0	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-6	MW-7	2006	2	Phase I	30	**1.7**	<0.5	4.5	2.3	8.6	2.6	<5	8.1	<0.01	<10	<5	<5	<5
P3-MW-7-2	MW-7	2007	3	Phase I	40	**1.15**	<0.5	4.3	<2	8.0	<30	<5	8.1	<0.01	<10	<5	**31**	<5
Not sampled - refusal	MW-7	2008	4	Phase I	40-50													
P309-7WB	MW-7	2009	5	Phase I	25-35	<1	<0.1	3.0	2.0	6.0	1.0	3.0	<10	<0.01	<12	**13**	**24**	<10
S11-026	MW-7	2011	7	Phase II	40-50	<2	0.1	**87.9**	3.7	**12.0**	<5	**44.9**	**20.3**	<0.45	<5	N/A	N/A	N/A
P314-7WB	MW-7	2014	10	Phase II	40-50	**1.1**	0.01	4.3	2.3	7.3	<4.9	3.7	7.0	<0.10	<10	<50	<50	<100
MW-7B	MW-7	2019	15	Phase II	20-30	<1.0	<0.050	5.1	2.0	**12.0**	1.6	3.7	7.5	<0.010	<3.5	<2.0	9.6	<3.9

TABLE 1

PIN-3 Main Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**12.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**15.7**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.00	0.0	0.0	13.2	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**46.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**55.4**	**50.0**
Downgradient																		
	MW-8 surface																	
05-26640	MW-8	2005	1	Phase I	0	<1	<1	<20	<5	5.9	<10	<5	<15	<0.003	<10	4	**17**	12
05-26641 (Dup)	MW-8	2005	1	Phase I	0	<1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6	**20**	12
TP-7	MW-8	2006	2	Phase I	10	0.447	<0.5	2.9	<2	4.2	<2	<5	4.8	<0.01	<10	<5	<5	<5
P3-MW-8-1	MW-8	2007	3	Phase I	10	0.331	<0.5	3.6	<2	4.0	<30	<5	5.0	<0.01	<10	<5	**19**	6
P3-MW-8A	MW-8	2008	4	Phase I	10	<5	<0.5	2.5	<2	2.9	<2	<5	3.0	<0.05	<10	<30	<50	N/A
P309-8WA	MW-8	2009	5	Phase I	0-15	<1	<0.1	2.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	**17**	28
SS11-027	MW-8	2011	7	Phase II	0-15	<2	<0.1	<5	1.7	5.1	<5	4.2	12.5	<0.45	<5	N/A	N/A	N/A
SS11-028 (Interlab)	MW-8	2011	7	Phase II	0-15	<1	<0.1	3.0	1.0	<5	<1	3.0	<10	<0.01	<12	<10	<10	<10
P314-8WA	MW-8	2014	10	Phase II	0-15	0.7	<0.01	4.0	2.0	5.1	<5	3.1	5.0	<0.10	<10	<50	<50	<100
MW-8A	MW-8	2019	15	Phase II	0-15	<1.0	<0.050	2.9	1.1	4.6	0.59	2.1	3.8	<0.010	<3.5	4.2	11	<4.7
	MW-8 depth																	
05-26642	MW-8	2005	1	Phase I	30	<1	<1	<20	<5	<5	<10	<5	<15	<0.003	**11**	5	<9	8
05-26643 (Dup)	MW-8	2005	1	Phase I	30	<1	<1	<20	<5	5.4	<10	<5	<15	<0.003	N/A	N/A	N/A	N/A
TP-8	MW-8	2006	2	Phase I	50	0.903	<0.5	6.1	2.6	6.8	<2	<5	9.5	<0.01	<10	<5	<5	<5
P3-MW-8-2	MW-8	2007	3	Phase I	50	0.521	<0.5	3.8	<2	4.5	<30	<5	4.8	<0.01	<10	<5	**18**	15
P3-MW-8B	MW-8	2008	4	Phase I	50	<5	<0.5	4.1	<2	5.5	<2	<5	4.2	<0.05	<10	<30	<50	N/A
P3-MW-13B (Dup)	MW-8	2008	4	Phase I	50	<5	<0.5	3.3	<2	3.6	<2	<5	3.9	<0.05	<10	<30	<50	N/A
P3-MW-13B (Interlab)	MW-8	2008	4	Phase I	50	0.6	<0.2	3.0	1.0	4.0	0.9	3.0	6.0	<0.030	<5	<5	<5	N/A
P309-8WB	MW-8	2009	5	Phase I	40-50	<1	<0.1	2.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	13	11
SS11-029	MW-8	2011	7	Phase II	40-50	<2	<0.1	<5	2.0	4.1	<5	4.3	12.3	<0.45	<5	N/A	N/A	N/A
SS11-030 (Interlab)	MW-8	2011	7	Phase II	40-50	<1	<0.1	4.0	2.0	<5	<1	3.0	<10	<0.01	<12	<10	<10	<10
P314-8WB	MW-8	2014	10	Phase II	40-50	0.6	<0.01	6.4	2.4	7.3	<5	4.6	5.0	<0.10	<10	<50	<50	<100
MW-8B	MW-8	2019	15	Phase II	40-50	<1.0	<0.050	3.2	1.3	3.7	1.1	2.3	4.0	<0.010	<3.5	3.1	11	<4.7

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

N/A = not analyzed

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

Some 2011 interlab duplicate TPH results reported as F1-F4 fractions.

TABLE 1A

PIN-3 Main Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
03-9619	MW-5	2003			<0.0030	<0.0010	<0.0050	<0.0030	0.0130	<0.0100	0.0110	0.0230	N/A	N/A	N/A	N/A
04-15421	MW-5	2004			<0.0030	<0.0010	0.0080	<0.0030	0.0070	<0.0100	0.0150	0.0140	<0.05	<0.5	<1.0	<1.0
Downgradient																
04-15422	MW-6	2004			<0.0030	<0.0010	0.0190	<0.0030	<0.0050	<0.0100	0.0090	<0.0100	<0.05	<0.5	<1.0	<1.0
04-15424	MW-7	2004			<0.0030	<0.0010	0.0350	<0.0030	0.0110	<0.0100	0.0190	0.0240	<0.05	<0.5	<1.0	<1.0
04-15425	MW-8	2004			0.0050	<0.0010	0.0930	0.0050	0.0100	<0.0100	0.0480	0.0190	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0022	0.0005	0.0315	0.0022	0.0087	0.0050	0.0204	0.0170	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0315**	**0.0030**	**0.0087**	**0.0100**	**0.0204**	**0.0170**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0366	0.0000	0.0041	0.0000	0.0159	0.0078	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1412**	**0.0030**	**0.0210**	**0.0100**	**0.0681**	**0.0403**	**0.05**	**0.5**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Monitoring Data																
Upgradient - MW-5																
05-26748	MW-5	2005	1	Phase I	<0.0030	<0.0010	<0.0050	<0.0030	0.0076	<0.010	0.0130	**0.0190**	<0.05	<0.5	<1.0	<1.0
MW-1	MW-5	2006	2	Phase I	0.0015	<0.000034	<0.0020	**0.00559**	<0.0020	<0.0010	0.0103	<0.010	<0.1	<0.25	<0.25	N/A
P3-MW-5	MW-5	2007	3	Phase I	<0.0025	0.000365	<0.0050	**0.0160**	**0.0131**	<0.0025	**0.0421**	<0.025	<0.1	N/A	N/A	N/A
P3-MW-17 (Dup)	MW-5	2007	3	Phase I	<0.0025	0.000282	<0.0050	**0.0138**	**0.0092**	<0.0025	**0.0394**	<0.025	<0.1	N/A	N/A	N/A
P3-MW-17 (Interlab)	MW-5	2007	3	Phase I	0.0010	<0.0002	<0.001	**0.0100**	0.0060	<0.001	**0.0230**	0.0170	N/A	0.26	<0.25	<0.25
P3-MW-5	MW-5	2008	4	Phase I	<0.0010	<0.00005	<0.0005	0.00171	0.0039	<0.0010	0.0112	0.0089	<0.1	N/A	N/A	N/A
P309-5W	MW-5	2009	5	Phase I	0.0003	0.000072	0.0040	0.0011	0.0052	<0.0002	0.0130	0.0050	<0.1	<0.1	<0.1	N/A
WS11-005	MW-5	2011	7	Phase II	<0.0010	<0.0005	<0.020	**0.0140**	<0.0020	<0.0010	**0.1780**	**0.0700**	<0.5	N/A	N/A	N/A
P314-5W	MW-5	2014	10	Phase II	0.0010	<0.00001	0.0069	**0.0048**	0.0030	0.0002	**0.0235**	0.0080	<0.2	0.20	<0.1	<0.1
MW-5	MW-5	2019	15	Phase II	0.00048	0.000026	<0.0010	0.00056	0.0041	0.00014	0.0110	0.0030	<0.015	<0.020	<0.043	<0.055

TABLE 1A

PIN-3 Main Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
03-9619	MW-5	2003			<0.0030	<0.0010	<0.0050	<0.0030	0.0130	<0.0100	0.0110	0.0230	N/A	N/A	N/A	N/A
04-15421	MW-5	2004			<0.0030	<0.0010	0.0080	<0.0030	0.0070	<0.0100	0.0150	0.0140	<0.05	<0.5	<1.0	<1.0
Downgradient																
04-15422	MW-6	2004			<0.0030	<0.0010	0.0190	<0.0030	<0.0050	<0.0100	0.0090	<0.0100	<0.05	<0.5	<1.0	<1.0
04-15424	MW-7	2004			<0.0030	<0.0010	0.0350	<0.0030	0.0110	<0.0100	0.0190	0.0240	<0.05	<0.5	<1.0	<1.0
04-15425	MW-8	2004			0.0050	<0.0010	0.0930	0.0050	0.0100	<0.0100	0.0480	0.0190	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0022	0.0005	0.0315	0.0022	0.0087	0.0050	0.0204	0.0170	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0315**	**0.0030**	**0.0087**	**0.0100**	**0.0204**	**0.0170**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0366	0.0000	0.0041	0.0000	0.0159	0.0078	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1412**	**0.0030**	**0.0210**	**0.0100**	**0.0681**	**0.0403**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-6																
05-26747	MW-6	2005	1	Phase I	<0.0030	<0.0010	**0.0350**	<0.0030	0.0065	<0.010	0.0150	0.0140	<0.05	<0.5	<1.0	<1.0
MW-2	MW-6	2006	2	Phase I	<0.0010	<0.000034	0.0171	<0.0006	<0.0020	<0.0010	0.0020	<0.010	<0.1	<0.25	<0.25	N/A
Not sampled - insufficient volume	MW-6	2007	3	Phase I												
P3-MW-6	MW-6	2008	4	Phase I	<0.0050	<0.00025	0.0135	<0.0025	<0.0050	<0.0050	<0.025	**0.0357**	<0.1	N/A	N/A	N/A
P309-6W	MW-6	2009	5	Phase I	**0.0250**	0.00015	**1.1000**	**0.0091**	**0.0420**	**0.0340**	**0.3000**	**2.2000**	<0.1	<0.1	<0.1	N/A
WS11-001	MW-6	2011	7	Phase II	<0.0010	<0.0005	<0.020	0.0010	<0.0020	<0.0010	**0.0240**	**0.0800**	<0.5	N/A	N/A	N/A
WS11-002 (Dup)	MW-6	2011	7	Phase II	<0.0010	<0.0005	<0.020	0.0010	<0.0020	<0.0010	**0.0220**	**0.0600**	<0.5	N/A	N/A	N/A
WS11-001 (Interlab)	MW-6	2011	7	Phase II	0.0007	0.000007	0.0090	0.0007	0.0024	0.0002	0.0140	0.0150	<0.1	<0.1	<0.1	<0.1
P314-6W	MW-6	2014	10	Phase II	**0.0187**	<0.00001	**0.6250**	**0.0093**	**0.0410**	**0.0174**	**0.2200**	**0.5070**	<0.2	<0.2	<0.1	<0.1
MW-6	MW-6	2019	15	Phase II	0.00045	<0.000020	0.0045	0.00033	0.0016	0.00024	0.0069	0.0140	**0.063**	<0.020	<0.043	<0.055

TABLE 1A

PIN-3 Main Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
03-9619	MW-5	2003			<0.0030	<0.0010	<0.0050	<0.0030	0.0130	<0.0100	0.0110	0.0230	N/A	N/A	N/A	N/A
04-15421	MW-5	2004			<0.0030	<0.0010	0.0080	<0.0030	0.0070	<0.0100	0.0150	0.0140	<0.05	<0.5	<1.0	<1.0
Downgradient																
04-15422	MW-6	2004			<0.0030	<0.0010	0.0190	<0.0030	<0.0050	<0.0100	0.0090	<0.0100	<0.05	<0.5	<1.0	<1.0
04-15424	MW-7	2004			<0.0030	<0.0010	0.0350	<0.0030	0.0110	<0.0100	0.0190	0.0240	<0.05	<0.5	<1.0	<1.0
04-15425	MW-8	2004			0.0050	<0.0010	0.0930	0.0050	0.0100	<0.0100	0.0480	0.0190	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0022	0.0005	0.0315	0.0022	0.0087	0.0050	0.0204	0.0170	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0315**	**0.0030**	**0.0087**	**0.0100**	**0.0204**	**0.0170**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0366	0.0000	0.0041	0.0000	0.0159	0.0078	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1412**	**0.0030**	**0.0210**	**0.0100**	**0.0681**	**0.0403**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-7																
05-26746	MW-7	2005	1	Phase I	<0.0030	<0.0010	0.0190	<0.0030	**0.0099**	<0.010	0.0130	**0.0220**	<0.05	<0.5	<1.0	<1.0
MW-3	MW-7	2006	2	Phase I	<0.0050	<0.00017	<0.010	<0.0030	<0.010	<0.0050	<0.010	<0.050	<0.1	<0.25	<0.25	N/A
Not sampled - insufficient volume	MW-7	2007	3	Phase I												
P3-MW-7	MW-7	2008	4	Phase I	<0.010	<0.0005	0.0055	<0.0050	<0.010	<0.010	<0.050	<0.0050	N/A	N/A	N/A	N/A
P309-7W	MW-7	2009	5	Phase I	**0.0300**	0.00029	**0.3400**	**0.0064**	**0.0420**	**0.0260**	**0.1000**	**0.0300**	N/A	N/A	N/A	N/A
WS11-003	MW-7	2011	7	Phase II	<0.0010	<0.0005	<0.020	<0.0010	<0.0020	<0.0010	0.0040	**0.0200**	<0.5	N/A	N/A	N/A
P314-7W	MW-7	2014	10	Phase II	**0.0044**	0.00009	**0.0506**	0.0005	0.0070	0.0016	0.0125	0.0140	<0.2	0.20	<0.1	<0.1
MW-7	MW-7	2019	15	Phase II	0.00059	<0.000020	0.0046	0.00073	0.0013	0.00034	0.0120	0.0110	0.043	<0.020	<0.043	<0.055

TABLE 1A

PIN-3 Main Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
03-9619	MW-5	2003			<0.0030	<0.0010	<0.0050	<0.0030	0.0130	<0.0100	0.0110	0.0230	N/A	N/A	N/A	N/A
04-15421	MW-5	2004			<0.0030	<0.0010	0.0080	<0.0030	0.0070	<0.0100	0.0150	0.0140	<0.05	<0.5	<1.0	<1.0
Downgradient																
04-15422	MW-6	2004			<0.0030	<0.0010	0.0190	<0.0030	<0.0050	<0.0100	0.0090	<0.0100	<0.05	<0.5	<1.0	<1.0
04-15424	MW-7	2004			<0.0030	<0.0010	0.0350	<0.0030	0.0110	<0.0100	0.0190	0.0240	<0.05	<0.5	<1.0	<1.0
04-15425	MW-8	2004			0.0050	<0.0010	0.0930	0.0050	0.0100	<0.0100	0.0480	0.0190	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0022	0.0005	0.0315	0.0022	0.0087	0.0050	0.0204	0.0170	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0315**	**0.0030**	**0.0087**	**0.0100**	**0.0204**	**0.0170**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0366	0.0000	0.0041	0.0000	0.0159	0.0078	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1412**	**0.0030**	**0.0210**	**0.0100**	**0.0681**	**0.0403**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-8																
05-26745	MW-8	2005	1	Phase I	**0.0037**	<0.0010	**0.0640**	**0.0036**	0.0080	<0.010	**0.0370**	**0.0190**	<0.05	<0.5	<1.0	<1.0
05-26744 (Dup)	MW-8	2005	1	Phase I	0.0030	<0.0010	**0.0700**	<0.003	**0.0090**	<0.010	**0.0300**	**0.0220**	N/A	N/A	N/A	N/A
MW-4	MW-8	2006	2	Phase I	<0.0025	<0.000085	<0.0050	<0.0015	<0.0050	<0.0025	**0.0218**	<0.025	<0.1	<0.25	<0.25	N/A
P3-MW-8	MW-8	2007	3	Phase I	<0.016	<0.00034	**0.0760**	<0.0060	<0.020	<0.010	**0.0550**	<0.10	<0.1	N/A	N/A	N/A
P3-MW-8	MW-8	2008	4	Phase I	<0.0050	<0.00025	<0.0025	<0.0025	<0.0050	<0.0050	<0.025	**0.0173**	<0.1	N/A	N/A	N/A
P3-MW-13 (Interlab)	MW-8	2008	4	Phase I	0.0006	<0.00004	<0.0002	0.0006	0.0026	<0.0002	0.0150	0.0020	N/A	N/A	N/A	N/A
P309-8W	MW-8	2009	5	Phase I	**0.0130**	0.00011	**0.2500**	**0.0120**	**0.0140**	**0.0120**	**0.1300**	**0.0280**	<0.1	<0.1	<0.1	N/A
P309-BD1W (Dup)	MW-8	2009	5	Phase I	0.0016	0.000013	**0.0340**	0.0022	0.0027	0.0025	**0.0230**	0.0060	<0.1	<0.1	<0.1	N/A
WS11-004	MW-8	2011	7	Phase II	<0.0010	<0.0005	<0.020	0.0020	<0.0020	<0.0010	**0.0380**	**0.0700**	<0.5	N/A	N/A	N/A
P314-8W	MW-8	2014	10	Phase II	**0.0172**	0.00083	**0.2310**	**0.0167**	**0.0260**	0.0088	**0.1920**	**0.0760**	<0.2	0.20	<0.1	<0.1
P314-BDW1 (Dup)	MW-8	2014	10	Phase II	**0.0293**	0.00079	**0.4090**	**0.0279**	**0.0410**	**0.0141**	**0.3150**	**0.1200**	<0.2	0.20	<0.1	0.20
P314-8W (Interlab)	MW-8	2014	10	Phase II	**0.0100**	0.00084	**0.1400**	**0.0100**	**0.0170**	0.0072	**0.1200**	**0.0540**	<0.1	<0.1	<0.2	N/A
MW-8	MW-8	2019	15	Phase II	0.0004	<0.000020	0.0028	0.00063	0.0011	0.00022	0.0110	0.0086	0.042	<0.020	<0.043	<0.055

Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

N/A = not analyzed

2006 hydrocarbons analyzed as VPH/EPH.

2007 hydrocarbons analyzed as Total Extractable Hydrocarbons.

2008 hydrocarbons analyzed at TPH plus F1 fraction HCs.

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

TABLE 2

PIN-3 North Warning System Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**13.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**79.7**	**57.4**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	8.8	0.0	2.5	0.0	0.00	0.0	0.0	119.9	91.3
Baseline Data Mean + 3x Standard Deviation						**3.3**	**1.0**	**20.0**	**5.0**	**40.2**	**10.0**	**12.6**	**15.0**	**0.10**	**10.0**	**10.0**	**439.5**	**331.3**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P3-1 surface																	
05-26668	P3-1	2005	1	Phase I	0	**2.4**	<1	<20	<5	7.2	<10	<5	**16.5**	<0.003	<10	<4	54	57
P3-1-1	P3-1	2007	3	Phase I	10	**2.32**	<1	5.2	<2	11.9	<30	<5	**19.5**	<0.01	<10	**24**	**700**	**790**
P309-1A	P3-1	2009	5	Phase I	0-15	**2.0**	<0.1	3.0	1.0	<5	2.0	3.0	<10	<0.01	<12	<10	11	<10
SS11-012	P3-1	2011	7	Phase II	0-15	<2	<0.1	**31.6**	1.8	5.9	<5	**19.0**	10.3	<0.45	<5	N/A	N/A	N/A
P314-1A	P3-1	2014	10	Phase II	0-15	**2.1**	0.28	5.2	3.0	13.5	5.7	4.9	**57.0**	<0.10	<10	<50	**108**	<100
P3-1A	P3-1	2019	15	Phase II	0-15	**1.5**	<0.050	4.2	1.4	6.9	1.9	2.8	6.1	<0.010	<3.5	4.7	60	14
	P3-1 depth																	
05-26670	P3-1	2005	1	Phase I	30	**1.4**	<1	<20	<5	<5	<10	<5	<15	0.0034	<10	<4	12	<8
P3-1-2	P3-1	2007	3	Phase I	40	**1.6**	<0.5	4.1	<2	3.9	<30	<5	7.6	<0.01	<10	5	5	<5
P309-1B	P3-1	2009	5	Phase I	25-35	**3.0**	<0.1	3.0	1.0	<5	3.0	2.0	<10	<0.01	<12	<10	49	<10
SS11-013	P3-1	2011	7	Phase II	40-50	**2.0**	<0.1	18.9	2.0	3.3	<5	**13.1**	9.7	<0.45	<5	N/A	N/A	N/A
SS11-014 (Interlab)	P3-1	2011	7	Phase II	40-50	1.0	0.1	4.0	2.0	<5	3.0	5.0	<10	<0.01	<12	<10	<10	<10
P314-1B	P3-1	2014	10	Phase II	25-35	1.0	<0.01	2.6	1.3	1.9	<5	1.5	4.0	<0.10	<10	<50	<50	<100
P3-1B	P3-1	2019	15	Phase II	20-28	**2.1**	<0.050	3.9	1.2	6.8	2.4	2.4	5.3	<0.010	<3.5	<3.0	46	<4.7

TABLE 2

PIN-3 North Warning System Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**13.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**79.7**	**57.4**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	8.8	0.0	2.5	0.0	0.00	0.0	0.0	119.9	91.3
Baseline Data Mean + 3x Standard Deviation						**3.3**	**1.0**	**20.0**	**5.0**	**40.2**	**10.0**	**12.6**	**15.0**	**0.10**	**10.0**	**10.0**	**439.5**	**331.3**
Downgradient																		
	P3-2 surface																	
05-26656	P3-2	2005	1	Phase I	0	1.1	<1	<20	<5	6.6	<10	<5	<15	<0.003	<10	5.9	16	<8
P3-2-1	P3-2	2007	3	Phase I	10	**1.17**	<0.5	6.1	2.4	10.2	<30	<5	9.2	<0.01	<10	6	<5	<5
P309-2A	P3-2	2009	5	Phase I	0-15	1.0	<0.1	5.0	2.0	9.0	2.0	4.0	<10	<0.01	<12	<10	12	<10
P309-BD4 (Dup)	P3-2	2009	5	Phase I	0-15	1.0	<0.1	5.0	2.0	<5	2.0	3.0	<10	<0.01	<12	<10	<10	<10
SS11-015	P3-2	2011	7	Phase II	0-15	<2	0.2	**31.8**	3.2	10.9	<5	**20.0**	**22.6**	<0.45	<5	N/A	N/A	N/A
SS11-016 (Interlab)	P3-2	2011	7	Phase II	0-15	<1	<0.1	6.0	3.0	8.0	2.0	**10.0**	<10	<0.01	<12	<10	<10	<10
P314-2A	P3-2	2014	10	Phase II	0-15	**1.5**	0.03	4.9	2.7	6.9	<5	3.4	7.0	<0.10	<10	<50	<50	<100
P3-2A	P3-2	2019	15	Phase II	0-15	1.1	<0.050	5.3	2.2	13.0	1.9	4.7	7.8	<0.010	<3.5	<3.0	13	<4.7
	P3-2 depth																	
05-26658	P3-2	2005	1	Phase I	30	**1.7**	<1	<20	<5	9.6	<10	**5.7**	<15	<0.003	<10	<4	<9	<8
P3-2-2	P3-2	2007	3	Phase I	50	0.984	<0.5	5.4	2.4	8.4	<30	<5	9.2	<0.01	<10	<5	<5	<5
P3-20-2 (Dup)	P3-2	2007	3	Phase I	50	1.0	<1	5.2	2.4	9.2	<30	<5	7.9	<0.05	<10	<5	<5	<5
P3-20-2 (Interlab)	P3-2	2007	3	Phase I	50	<10	<0.5	5.0	2.0	4.0	<5	3.0	7.0	<0.03	<5	<80	<250	N/A
P309-2B	P3-2	2009	5	Phase I	40-50	1.0	<0.1	5.0	2.0	12.0	2.0	4.0	<10	<0.01	<12	<10	<10	<10
SS11-017	P3-2	2011	7	Phase II	40-50	<2	0.1	**25.4**	3.0	8.0	<5	**16.9**	14.1	<0.45	<5	N/A	N/A	N/A
P314-2B	P3-2	2014	10	Phase II	40-50	1.0	<0.01	7.0	3.1	5.3	<5	4.5	7.0	<0.10	<10	<50	<50	<100
P3-2B	P3-2	2019	15	Phase II	40-50	<1.0	<0.050	5.2	1.9	8.8	1.6	4.1	6.4	<0.010	<3.5	4.5	20	<4.7

TABLE 2

PIN-3 North Warning System Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**13.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**79.7**	**57.4**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	8.8	0.0	2.5	0.0	0.00	0.0	0.0	119.9	91.3
Baseline Data Mean + 3x Standard Deviation						**3.3**	**1.0**	**20.0**	**5.0**	**40.2**	**10.0**	**12.6**	**15.0**	**0.10**	**10.0**	**10.0**	**439.5**	**331.3**
Downgradient																		
	P3-3 surface																	
05-26662	P3-3	2005	1	Phase I	0	**2.9**	<1	<20	<5	**19.7**	**13.7**	**10.2**	**36.7**	0.0046	<10	<4	**160**	30
P3-3-1	P3-3	2007	3	Phase I	10	**2.94**	<0.5	5.4	2.3	13.1	<30	<5	**20.0**	<0.01	<10	9	**200**	**170**
P309-3A	P3-3	2009	5	Phase I	0-15	**2.0**	<0.1	5.0	2.0	8.0	2.0	5.0	<10	<0.01	<12	<10	19	<10
SS11-018	P3-3	2011	7	Phase II	0-15	<2	0.2	**53.3**	2.9	11.3	<5	**30.1**	15.0	<0.45	<5	N/A	N/A	N/A
P314-3A	P3-3	2014	10	Phase II	0-15	**1.4**	0.05	4.3	2.3	7.6	<5	3.5	7.0	<0.10	<10	<50	<50	<100
P3-3A	P3-3	2019	15	Phase II	0-15	**1.4**	0.1	5.1	2.1	**14.0**	4.6	4.2	8.5	<0.010	<3.5	3.2	26	4.3
	P3-3 depth																	
05-26660	P3-3	2005	1	Phase I	30	<1	<1	<20	<5	9.0	<10	**5.8**	<15	<0.003	<10	4.3	10	<8
P3-3-2	P3-3	2007	3	Phase I	50	1.15	<0.5	6.7	2.8	7.5	<30	<5	8.9	<0.01	<10	<5	<5	<5
P309-3B	P3-3	2009	5	Phase I	40-50	1.0	<0.1	4.0	2.0	6.0	1.0	3.0	<10	<0.01	<12	<10	11	<10
SS11-019	P3-3	2011	7	Phase II	40-50	<2	0.1	**22.6**	2.8	9.9	<5	**16.0**	**17.3**	<0.45	<5	N/A	N/A	N/A
P314-3B	P3-3	2014	10	Phase II	40-50	**2.4**	0.27	5.3	3.9	**14.8**	<5	**6.8**	7.0	<0.10	<10	<50	<50	<100
P3-3B	P3-3	2019	15	Phase II	40-50	**1.3**	0.11	7.3	2.8	11.0	2.6	**5.7**	6.9	<0.010	<3.5	<2.0	13	<3.9

TABLE 2

PIN-3 North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**13.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**79.7**	**57.4**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	8.8	0.0	2.5	0.0	0.00	0.0	0.0	119.9	91.3
Baseline Data Mean + 3x Standard Deviation						**3.3**	**1.0**	**20.0**	**5.0**	**40.2**	**10.0**	**12.6**	**15.0**	**0.10**	**10.0**	**10.0**	**439.5**	**331.3**
Downgradient																		
	P3-4 surface																	
05-26664	P3-4	2005	1	Phase I	0	**2.0**	<1	<20	<5	7.4	<10	**6.3**	<15	<0.003	<10	<4	11	<8
P3-4-1	P3-4	2007	3	Phase I	10	**1.61**	<1	7.0	<4	13.2	<60	<10	**37.4**	<0.022	<10	**13**	<5	<5
P309-4A	P3-4	2009	5	Phase I	0-15	**3.0**	0.1	4.0	2.0	8.0	4.0	5.0	<10	<0.01	<12	<10	54	<10
SS11-020	P3-4	2011	7	Phase II	0-15	<2	0.5	**55.8**	1.9	8.2	6.1	**29.7**	**34.0**	<0.45	<5	N/A	N/A	N/A
P314-4A	P3-4	2014	10	Phase II	0-15	**1.5**	0.53	2.8	1.1	8.9	5.9	2.8	**55.0**	<0.10	<10	<50	60	<100
P314-BD2 (Dup)	P3-4	2014	10	Phase II	0-15	**1.3**	0.42	2.7	1.2	7.7	<4.9	2.7	**52.0**	<0.10	<10	<50	74	<100
P314-4A (Interlab)	P3-4	2014	10	Phase II	0-15	<2	0.53	3.6	<2	<10	3.7	3.9	**40.0**	<0.03	<31	<26	<130	N/A
P3-4A	P3-4	2019	15	Phase II	0-15	<1.0	<0.050	4.7	2.0	6.9	1.5	3.9	6.6	<0.010	<3.5	<2.0	21	<3.9
	P3-4 depth																	
05-26666	P3-4	2005	1	Phase I	30	**1.2**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-4-2	P3-4	2007	3	Phase I	40	**3.08**	<0.5	4.9	<2	10.0	<30	<5	9.9	<0.011	<10	<5	5	18
P309-4B	P3-4	2009	5	Phase I	40-50	**3.0**	<0.1	4.0	2.0	8.0	3.0	5.0	<10	<0.01	<12	<10	26	<10
SS11-021	P3-4	2011	7	Phase II	40-50	**2.3**	0.1	**68.0**	2.0	5.5	<5	**37.6**	8.3	<0.45	<5	N/A	N/A	N/A
P314-4B	P3-4	2014	10	Phase II	40-50	**6.2**	0.53	8.8	3.1	**22.2**	6.6	**10.3**	13.0	<0.10	<10	<50	53	<100
P3-4B	P3-4	2019	15	Phase II	35-40	<1.0	<0.050	4.7	1.8	6.6	1.2	3.5	5.8	<0.010	<3.5	<3.0	17	<4.7

N/A = not analyzed

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

Some 2011 interlab duplicate TPH results reported as F1-F4 fractions.

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

TABLE 3

PIN-3 South Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P3-5 Surface																	
05-26720	P3-5	2005	1	Phase I	0	<1	<1	<20	<5	8.1	<10	<5	<15	<0.003	<10	7.3	45	13
P3-5-1	P3-5	2007	3	Phase I	10	**1.58**	<0.5	5.7	2.9	7.1	<30	<5	9.7	<0.01	<10	<5	<5	<5
P309-5A	P3-5	2009	5	Phase I	0-15	<1	<0.1	2.0	1.0	**11.0**	<1	2.0	<10	<0.01	<12	<10	26	<10
SS11-059	P3-5	2011	7	Phase II	0-15	<2	0.1	**21.9**	3.1	**15.3**	<5	**14.0**	**19.8**	<0.45	<5	N/A	N/A	N/A
P314-5A	P3-5	2014	10	Phase II	0-15	**1.4**	0.03	5.7	3.2	**13.7**	<5	**5.4**	10.0	<0.10	<10	<50	<50	<100
P3-5A	P3-5	2019	15	Phase II	0-15	<1.0	<0.050	2.4	1.0	4.9	0.63	2.0	3.5	<0.010	<3.5	<3.0	32	<4.7
	P3-5 Depth																	
05-26722	P3-5	2005	1	Phase I	30	<1	<1	<20	<5	10.0	<10	<5	<15	<0.003	<10	5.8	<9	<8
P3-5-2	P3-5	2007	3	Phase I	50	**1.24**	<0.5	4.6	<2	8.1	<30	<5	6.7	<0.01	<10	<5	<5	<5
P309-5B	P3-5	2009	5	Phase I	40-50	<1	<0.1	2.0	1.0	**12.0**	<1	3.0	<10	<0.01	<12	<10	28	12
SS11-060	P3-5	2011	7	Phase II	40-50	<2	<0.1	15.1	1.4	9.4	<5	**8.5**	9.4	<0.45	<5	N/A	N/A	N/A
P314-5B	P3-5	2014	10	Phase II	40-50	**1.5**	0.37	5.6	3.9	**17.7**	5.8	**5.5**	12.0	<0.10	<10	<50	<50	<100
P3-5B	P3-5	2019	15	Phase II	40-50	<1.0	0.16	3.0	1.6	**11.0**	1.2	4.0	8.4	<0.020	<7.0	<5.9	**140**	<9.4

TABLE 3

PIN-3 South Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
Upgradient																		
	P3-9 Surface																	
05-26730	P3-9	2005	1	Phase I	0	**1.7**	<1	<20	<5	**13.8**	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-9-1	P3-9	2007	3	Phase I	10	**1.02**	<0.5	5.2	2.3	5.7	<30	<5	7.9	<0.05	<10	<5	<5	<5
P309-9A	P3-9	2009	5	Phase I	0-15	<1	<0.1	3.0	2.0	**11.0**	3.0	4.0	<10	<0.01	<12	<10	<10	<10
SS11-062	P3-9	2011	7	Phase II	0-15	<2	<0.1	**20.2**	2.5	6.8	<5	**12.1**	12.1	<0.45	<5	N/A	N/A	N/A
P314-9A	P3-9	2014	10	Phase II	0-15	**1.1**	<0.01	6.3	2.9	8.9	<4.9	4.4	8.0	<0.10	<10	<50	<50	<100
P3-9A	P3-9	2019	15	Phase II	0-15	**1.1**	<0.050	4.1	2.2	8.2	1.5	3.8	7.1	<0.010	<3.5	**39**	43	<4.7
	P3-9 Depth																	
05-26736	P3-9	2005	1	Phase I	30	<1	<1	<20	**5.6**	**12.7**	<10	**5.3**	<15	<0.003	<10	**54**	**46**	<8
P3-9-2	P3-9	2007	3	Phase I	50	**1.15**	<0.5	4.8	2.7	**10.2**	<30	<5	8.3	<0.05	<10	**26**	40	<5
P3-22-2 (Dup)	P3-9	2007	3	Phase I	50	**1.06**	<0.5	5.8	2.9	9.4	<30	<5	8.9	<0.05	<10	**120**	**110**	6
P3-22-2 (Interlab)	P3-9	2007	3	Phase I	50	<10	<0.5	5.0	3.0	6.0	<5	4.0	9.0	<0.03	<5	<80	<250	N/A
P309-9B	P3-9	2009	5	Phase I	40-50	<1	<0.1	2.0	1.0	<5	1.0	2.0	<10	<0.01	<12	<10	<10	<10
SS11-063	P3-9	2011	7	Phase II	40-50	<2	<0.1	**61.9**	2.9	8.7	<5	**30.6**	12.4	<0.45	<5	N/A	N/A	N/A
P314-9B	P3-9	2014	10	Phase II	40-50	0.8	<0.01	4.3	2.3	6.4	<4.9	3.2	6.0	<0.10	<10	**230**	**158**	<100
P3-9B	P3-9	2019	15	Phase II	40-50	**1.2**	<0.050	4.1	2.4	10.0	1.6	3.4	7.2	<0.010	<3.5	**14**	20	<4.7

TABLE 3

PIN-3 South Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
Downgradient																		
	P3-6 surface																	
05-26724	P3-6	2005	1	Phase I	0	1.0	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-6-1	P3-6	2007	3	Phase I	10	0.491	<0.5	3.2	<2	**124.0**	<30	**9.1**	6.1	<0.01	<10	**13**	**120**	**130**
P309-6A	P3-6	2009	5	Phase I	0-15	<1	<0.1	1.0	<1	<5	<1	1.0	<10	<0.01	<12	**11**	19	<10
SS11-054	P3-6	2011	7	Phase II	0-15	<2	<0.1	<5	1.1	2.6	<5	3.2	8.7	<0.45	<5	N/A	N/A	N/A
P314-6A	P3-6	2014	10	Phase II	0-15	0.9	0.01	3.3	1.9	4.6	<5	3.1	5.0	<0.10	<10	<50	<50	<100
P3-6A	P3-6	2019	15	Phase II	0-15	<1.0	<0.050	2.1	0.91	2.8	0.68	1.7	3.3	<0.010	<3.5	<3.0	<6.4	<4.7
	P3-6 depth																	
05-26726	P3-6	2005	1	Phase I	30	**1.4**	<1	<20	<5	**16.0**	<10	<5	<15	<0.003	<10	8	10	<8
P3-6-2	P3-6	2007	3	Phase I	50	**1.36**	<0.5	5.5	2.6	7.5	<30	<5	8.3	<0.01	<10	<5	<5	<5
P309-6B	P3-6	2009	5	Phase I	40-50	<1	<0.1	3.0	1.0	7.0	<1	3.0	<10	<0.01	<12	<10	15	<10
SS11-056	P3-6	2011	7	Phase II	40-50	<2	0.1	**27.2**	2.4	**10.1**	<5	**14.9**	**15.9**	<0.45	<5	N/A	N/A	N/A
P314-6B	P3-6	2014	10	Phase II	40-50	**1.2**	0.07	4.5	3.5	**12.9**	<5	5.0	7.0	<0.10	<10	<50	<50	<100
P314-BD3 (Dup)	P3-6	2014	10	Phase II	40-50	**2.2**	0.03	3.2	2.4	**12.8**	<5	3.5	5.0	<0.10	<10	<50	<50	<100
P314-6B (Interlab)	P3-6	2014	10	Phase II	40-50	1.0	<0.1	**57.0**	2.2	7.4	1.1	**27.0**	<10	<0.01	<12	<10	<50	N/A
P3-6B	P3-6	2019	15	Phase II	40-50	<1.0	<0.050	2.5	0.97	9.0	0.7	1.9	4.2	<0.010	<3.5	<3.0	13	<4.7

TABLE 3

PIN-3 South Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
Downgradient																		
	P3-7 surface																	
05-26712	P3-7	2005	1	Phase I	0	**1.2**	<1	<20	<5	**14.1**	<10	**5.7**	**15.7**	<0.003	<10	4.7	<9	<8
P3-7-1	P3-7	2007	3	Phase I	10	**1.54**	<0.5	6.9	3.0	**14.6**	<30	**5.1**	12.0	<0.05	<10	<5	<5	<5
P309-7A	P3-7	2009	5	Phase I	0-15	**2.0**	<0.1	**42.0**	3.0	8.0	4.0	**21.0**	<10	<0.01	<12	<10	17	<10
SS11-052	P3-7	2011	7	Phase II	0-15	**2.2**	0.1	**40.1**	4.6	**20.8**	<5	**22.9**	**18.5**	<0.45	<5	N/A	N/A	N/A
P314-7A	P3-7	2014	10	Phase II	0-15	**1.3**	0.03	4.8	3.4	**12.1**	<4.9	5.0	8.0	<0.10	<10	<50	**53**	<100
P3-7A	P3-7	2019	15	Phase II	0-15	**3.7**	<0.050	7.4	3.2	**14.0**	4.8	**6.1**	11.0	<0.010	<3.5	<2.0	12	<3.9
	P3-7 depth																	
05-26714	P3-7	2005	1	Phase I	30	**1.9**	<1	<20	<5	**12.2**	<10	**6.4**	**16.9**	<0.003	<10	4	<9	10
P3-7-2	P3-7	2007	3	Phase I	50	**1.01**	<0.5	6.2	2.5	9.4	<30	<5	9.4	<0.05	10	**14**	<5	<5
P309-7B	P3-7	2009	5	Phase I	40-50	1.0	<0.1	**27.0**	2.0	8.0	8.0	**13.0**	<10	<0.01	<12	<10	<10	<10
SS11-053	P3-7	2011	7	Phase II	40-50	**2.9**	0.1	**50.7**	4.4	**11.4**	<5	**26.9**	**17.1**	<0.45	<5	N/A	N/A	N/A
P314-7B	P3-7	2014	10	Phase II	40-50	0.5	<0.01	3.1	1.6	**17.4**	<5	2.7	4.0	<0.10	<10	<50	<50	<100
P3-7B	P3-7	2019	15	Phase II	40-50	**2.6**	0.091	6.6	2.9	**13.0**	6.2	**5.3**	12.0	<0.050	<3.5	2.2	14	<3.9

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PIN-3 South Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
Downgradient																		
	P3-8 surface																	
05-26716	P3-8	2005	1	Phase I	0	**1.4**	<1	<20	<5	**13.0**	<10	**5.6**	<15	0.0053	<10	<4	**120**	**140**
P3-8-1	P3-8	2007	3	Phase I	10	**1.2**	<0.5	7.0	2.9	**20.7**	<30	**5.4**	12.3	<0.05	<10	<5	**88**	**140**
P309-8A	P3-8	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	<5	4.0	3.0	<10	<0.01	<12	<10	34	**38**
P309-BD5 (Dup)	P3-8	2009	5	Phase I	0-15	<1	<0.1	2.0	2.0	<5	4.0	2.0	<10	<0.01	<12	<10	<10	<10
SS11-057	P3-8	2011	7	Phase II	0-15	<2	0.1	**25.0**	3.3	**16.0**	**14.3**	**15.0**	**22.1**	<0.45	<5	N/A	N/A	N/A
P314-8A	P3-8	2014	10	Phase II	0-15	1.0	0.04	5.9	2.6	**10.1**	**17.5**	4.1	10.0	<0.10	<10	<50	**467**	**665**
P3-8A	P3-8	2019	15	Phase II	0-15	**2.0**	<0.050	7.7	3.5	**13.0**	7.5	**5.6**	11.0	<0.010	<3.5	2.2	42	**41**
	P3-8 depth																	
05-26718	P3-8	2005	1	Phase I	30	**1.3**	<1	<20	<5	**15.3**	<10	<5	<15	0.0031	<10	<4	**300**	**540**
P3-8-2	P3-8	2007	3	Phase I	50	0.901	<0.5	4.3	2.0	8.8	<30	<5	7.1	<0.05	<10	<5	<5	**41**
P3-21-2 (Dup)	P3-8	2007	3	Phase I	50	**1.03**	<0.5	3.8	<2	7.2	<30	<5	6.3	<0.05	<10	<5	32	**29**
P3-21-2 (Interlab)	P3-8	2007	3	Phase I	50	<10	<0.5	4.0	2.0	7.0	<5	3.0	7.0	<0.03	<5	<80	<250	N/A
P309-8B	P3-8	2009	5	Phase I	40-50	<1	<0.1	3.0	2.0	<5	1.0	3.0	<10	<0.01	<12	<10	27	**32**
SS11-058	P3-8	2011	7	Phase II	40-50	<2	0.1	**20.4**	3.0	**18.8**	6.2	**12.5**	**16.6**	<0.45	<5	N/A	N/A	N/A
P314-8B	P3-8	2014	10	Phase II	40-50	**1.3**	0.02	3.6	2.3	**10.8**	<5	4.2	7.0	<0.10	<10	<50	**169**	**240**
P3-8B	P3-8	2019	15	Phase II	40-50	<1.0	<0.050	3.6	1.6	5.9	2.5	3.1	5.0	<0.050	<3.5	4.1	19	12

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
Downgradient																		
	P3-10 surface																	
05-26732	P3-10	2005	1	Phase I	0	<1	<1	<20	<5	7.4	<10	<5	<15	<0.003	<10	<4	<9	<8
P3-10-1	P3-10	2007	3	Phase I	10	0.838	<0.5	4.4	2.1	**11.2**	<30	<5	8.6	<0.05	<10	<5	<5	**35**
P309-10A	P3-10	2009	5	Phase I	0-15	<1	<0.1	2.0	1.0	<5	1.0	3.0	<10	<0.01	<12	<10	<10	<10
SS11-064	P3-10	2011	7	Phase II	0-15	<2	<0.1	11.3	1.7	5.7	<5	**7.1**	12.2	<0.45	<5	N/A	N/A	N/A
P314-10A	P3-10	2014	10	Phase II	0-15	0.7	<0.01	3.0	1.6	7.3	<5	2.4	5.0	<0.10	<10	<50	<50	<100
P3-10A	P3-10	2019	15	Phase II	0-15	<1.0	<0.050	4.4	2.0	**11.0**	1.3	3.6	9.0	<0.010	<3.5	<2.0	10	<3.9
	P3-10 depth																	
05-26734	P3-10	2005	1	Phase I	30	<1	<1	<20	<5	5.9	<10	<5	<15	<0.003	<10	4.3	<9	<8
P3-10-2	P3-10	2007	3	Phase I	50	**1.24**	<0.5	8.1	3.2	**15.1**	<30	**5.9**	10.1	<0.05	<10	<5	<5	7
P309-10B	P3-10	2009	5	Phase I	40-50	1.0	<0.1	2.0	1.0	6.0	1.0	2.0	<10	<0.01	<12	<10	<10	<10
SS11-066	P3-10	2011	7	Phase II	40-50	<2	0.1	18.6	1.9	7.0	<5	**10.4**	11.9	<0.45	<5	N/A	N/A	N/A
P314-10B	P3-10	2014	10	Phase II	40-50	1.0	<0.01	4.4	2.7	**21.8**	<4.9	3.8	7.0	<0.10	<10	<50	<50	<100
P3-10B	P3-10	2019	15	Phase II	40-50	<1.0	<0.050	2.8	1.3	5.3	0.95	2.5	4.4	<0.010	<3.5	2.3	17	<3.9

TABLE 3

PIN-3 South Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**10.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**45.8**	**24.3**
Baseline Data - Standard Deviation						0.4	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.00	0.0	0.0	36.8	22.5
Baseline Data Mean + 3x Standard Deviation						**2.3**	**1.0**	**20.0**	**5.0**	**24.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**156.1**	**91.8**
Downgradient																		
	P3-11 surface																	
05-26728	P3-11	2005	1	Phase I	0	**1.3**	<1	<20	<5	7.0	<10	<5	<15	<0.003	<30	8.7	14	<8
P3-11-1	P3-11	2007	3	Phase I	10	0.222	<0.5	3.9	<2	7.0	<30	<5	7.9	<0.05	<15	8	**210**	**250**
P309-11A	P3-11	2009	3	Phase I	0-15	<1	<0.1	2.0	1.0	<5	<1	3.0	<10	<0.02	<12	<10	<10	<10
SS11-067	P3-11	2011	5	Phase I	0-15	**2.8**	0.9	**28.0**	1.8	**11.0**	<5	**16.3**	**20.2**	<0.45	<5	N/A	N/A	N/A
SS11-068 (Dup)	P3-11	2011	5	Phase I	0-15	**4.7**	**1.4**	**28.9**	2.2	**18.5**	<5	**18.5**	**21.7**	<0.45	<5	N/A	N/A	N/A
P314-11A	P3-11	2014	10	Phase II	0-15	0.7	0.07	4.3	2.1	7.1	<5	3.3	6.0	<0.10	<10	<50	<50	<100
P3-11A	P3-11	2019	15	Phase II	0-15	<1.0	<0.050	3.1	1.6	7.0	0.81	2.9	4.6	<0.050	<6.6	6.6	**200**	**26**
	P3-11 depth																	
Not sampled	P3-11	2005	1	Phase I														
P3-11-2	P3-11	2007	1	Phase I	50	0.912	<0.5	5.2	2.4	**12.5**	<30	<5	9.0	<0.05	<10	<5	35	17
P309-11B	P3-11	2009	3	Phase I	40-50	1.0	<0.1	**48.0**	**6.0**	**39.0**	1.0	**32.0**	<10	<0.01	<12	<10	<10	<10
SS11-069	P3-11	2011	5	Phase I	40-50	**2.2**	0.1	**22.1**	2.6	**17.5**	<5	**13.3**	**15.3**	<0.45	<5	N/A	N/A	N/A
SS11-070 (Dup)	P3-11	2011	7	Phase II	40-50	<2	0.1	**26.0**	2.8	9.7	<5	**15.2**	**16.6**	<0.45	<5	N/A	N/A	N/A
P314-11B	P3-11	2014	10	Phase II	40-50	**2.2**	<0.01	6.4	4.0	**16.3**	<4.9	**6.3**	12.0	<0.10	<10	<50	<50	<100
P3-11B	P3-11	2019	15	Phase II	40-50	**1.4**	<0.050	6.2	2.7	**16.0**	2.2	**5.1**	7.9	<0.050	<3.5	3.8	12	<4.7
P3-19B (Dup)	P3-11	2019	15	Phase II	40-50	**1.8**	<0.050	5.8	2.5	**13.0**	2.1	4.8	7.3	<0.050	<3.5	<3.0	<6.4	<4.7

N/A = not analyzed

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

Some 2011 interlab duplicate TPH results reported as F1-F4 fractions.

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

TABLE 4

PIN-3 North Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**16.7**	**16.6**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.00	0.0	0.0	11.2	13.2
Baseline Data Mean + 3x Standard Deviation						**3.4**	**1.0**	**20.0**	**5.0**	**46.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.2**	**56.1**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P3-12 surface																	
05-26706	P3-12	2005	1	Phase I	0	**1.5**	<1	<20	<5	6.2	<10	<5	<15	0.0043	<10	<4	14	<8
P3-12-1	P3-12	2007	3	Phase I	10	**1.46**	<0.5	3.4	<2	**13.3**	<30	<5	**34.5**	<0.05	<10	<5	**51**	**30**
P309-12A	P3-12	2009	5	Phase I	0-15	<1	<0.1	3.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	10	<10
SS11-001	P3-12	2011	7	Phase II	0-15	<2	<0.1	7.8	1.8	4.0	<5	**6.4**	12.6	<0.45	<5	N/A	N/A	N/A
P314-12A	P3-12	2014	10	Phase II	0-15	0.9	0.03	3.9	1.7	7.0	<4.9	3.1	12.0	<0.10	<10	<50	<50	<100
P3-12A	P3-12	2019	15	Phase II	0-15	<1.0	<0.050	4.2	1.7	5.6	1.4	3.0	6.6	<0.010	<3.5	<2.0	**17**	<3.9
	P3-12 depth																	
Not sampled	P3-12	2005	1	Phase I														
P3-12-2	P3-12	2007	3	Phase I	40	1.0	<0.5	4.1	<2	3.5	<30	<5	6.9	<0.05	<10	<5	9	10
P309-12B	P3-12	2009	5	Phase I	20-30	<1	<0.1	2.0	<1	<5	<1	2.0	<10	<0.01	<12	<10	10	<10
SS11-002	P3-12	2011	7	Phase II	40-50	<2	0.1	10.1	2.1	4.1	<5	**8.1**	13.8	<0.45	<5	N/A	N/A	N/A
P314-12B	P3-12	2014	10	Phase II	20-30	1.0	0.03	4.1	2.0	3.3	<4.9	3.0	6.0	<0.10	<10	<50	<50	<100
P3-12B	P3-12	2019	15	Phase II	25-33	<1.0	<0.050	3.9	1.5	5.0	1.4	3.0	5.9	<0.010	<3.5	3.1	**32**	5.8

TABLE 4

PIN-3 North Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**16.7**	**16.6**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.00	0.0	0.0	11.2	13.2
Baseline Data Mean + 3x Standard Deviation						**3.4**	**1.0**	**20.0**	**5.0**	**46.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.2**	**56.1**
Downgradient																		
	P3-13 surface																	
05-26708	P3-13	2005	1	Phase I	0	**1.6**	<1	<20	<5	5.3	<10	<5	**16.6**	0.0039	<10	<4	**51**	**44**
P3-13-1	P3-13	2007	3	Phase I	10	1.08	<0.5	3.9	<2	4.6	<30	<5	13.4	<0.05	<10	<5	**140**	**200**
P309-13A	P3-13	2009	5	Phase I	0-15	<1	<0.1	2.0	<1	<5	2.0	2.0	<10	<0.01	<12	<10	**31**	12
SS11-003	P3-13	2011	7	Phase II	0-15	<2	<0.1	14.1	<1	<2	<5	**9.4**	7.3	<0.45	<5	N/A	N/A	N/A
P314-13A	P3-13	2014	10	Phase II	0-15	**1.2**	0.06	3.8	1.4	4.7	<5	2.5	**16.0**	<0.10	<10	<50	<50	<100
P3-13A	P3-13	2019	15	Phase II	0-15	**1.2**	<0.050	2.7	0.94	2.9	1.9	2.1	6.1	<0.010	<3.5	3.7	**39**	8.7
P3-17A (Dup)	P3-13	2019	15	Phase II	0-15	**1.2**	<0.050	2.7	0.95	3.4	2.4	3.0	5.5	<0.010	<3.5	3.2	**46**	8.9
	P3-13 depth																	
Not sampled	P3-13	2005	1	Phase I														
P3-13-2	P3-13	2007	3	Phase I	40	**1.83**	<0.5	3.4	<2	3.3	<30	<5	7.1	<0.05	<10	<5	**59**	**73**
P309-13B	P3-13	2009	5	Phase I	15-25	**2.0**	<0.1	2.0	<1	<5	3.0	2.0	<10	<0.01	<12	<10	**46**	15
SS11-004	P3-13	2011	7	Phase II	40-50	<2	<0.1	14.4	<1	<2	<5	**11.2**	7.4	<0.45	<5	N/A	N/A	N/A
Not sampled - refusal	P3-13	2014	10	Phase II														
P3-13B	P3-13	2019	15	Phase II	15-20	**1.2**	<0.050	2.6	1.1	**67.0**	1.9	2.2	6.8	<0.010	<3.5	<2.0	15	<3.9

TABLE 4

PIN-3 North Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**16.7**	**16.6**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.00	0.0	0.0	11.2	13.2
Baseline Data Mean + 3x Standard Deviation						**3.4**	**1.0**	**20.0**	**5.0**	**46.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.2**	**56.1**
Downgradient																		
	P3-14 surface																	
05-26710	P3-14	2005	1	Phase I	0	**1.4**	<1	<20	<5	<5	<10	<5	<15	0.0034	<10	4.1	**18**	**18**
P3-14-1	P3-14	2007	3	Phase I	10	0.768	<0.5	3.2	<2	3.7	<30	<5	8.1	<0.05	<10	<5	**31**	**59**
P309-14A	P3-14	2009	5	Phase I	0-15	**2.0**	<0.1	3.0	1.0	<5	2.0	3.0	<10	<0.01	<12	<10	**26**	<10
SS11-005	P3-14	2011	7	Phase II	0-15	<2	0.2	6.7	<1	3.5	<5	**5.8**	12.9	<0.45	<5	N/A	N/A	N/A
P314-14A	P3-14	2014	10	Phase II	0-15	1.0	0.02	3.8	1.4	3.0	<5	2.1	7.0	<0.10	<10	<50	<50	<100
P314-BD5 (Dup)	P3-14	2014	10	Phase II	0-15	0.9	0.02	3.3	1.2	2.7	<5	1.6	6.0	<0.10	<10	<50	<50	<100
P314-14A (Interlab)	P3-14	2014	10	Phase II	0-15	**1.2**	<0.1	18.0	1.1	8.7	2.2	**8.8**	<10	<0.01	<12	<10	<50	N/A
P3-14A	P3-14	2019	15	Phase II	0-15	<1.0	<0.050	4.0	1.2	6.3	1.8	2.5	9.2	<0.010	<3.5	3.3	**37**	8.8
	P3-14 depth																	
Not sampled	P3-14	2005	1	Phase I														
P3-14-2	P3-14	2007	3	Phase I	30	**2.85**	<0.5	3.2	<2	3.9	<30	<5	7.2	<0.05	<10	7	**52**	**51**
Not sampled - refusal	P3-14	2009	5	Phase I														
S11-006	P3-14	2011	7	Phase II	30-50	<2	<0.1	6.9	<1	2.9	<5	**6.5**	9.7	<0.45	<5	N/A	N/A	N/A
Not sampled - refusal	P3-14	2014	10	Phase II														
P3-14B	P3-14	2019	15	Phase II	15-20	1.0	<0.050	4.6	1.1	8.8	1.8	2.7	8.5	<0.010	<3.5	3.0	**52**	15

TABLE 4

PIN-3 North Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**16.7**	**16.6**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.00	0.0	0.0	11.2	13.2
Baseline Data Mean + 3x Standard Deviation						**3.4**	**1.0**	**20.0**	**5.0**	**46.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.2**	**56.1**
Downgradient																		
	P3-15 surface																	
05-26704	P3-15	2005	1	Phase I	0	**2.3**	<1	<20	<5	7.3	<10	<5	**15.2**	<0.003	<10	5.3	**31**	**38**
P3-15-1	P3-15	2007	3	Phase I	10	1.05	<0.5	4.5	<2	9.3	<30	<5	11.3	<0.05	<10	<5	**61**	**87**
P309-15A	P3-15	2009	5	Phase I	0-15	1.0	<0.1	3.0	1.0	<5	2.0	3.0	<10	<0.01	<12	<10	**34**	12
S11-010	P3-15	2011	7	Phase II	0-15	<2	<0.1	10.6	1.1	2.8	<5	**8.5**	11.4	<0.45	<5	N/A	N/A	N/A
P314-15A	P3-15	2014	10	Phase II	0-15	**1.3**	0.04	4.1	2.3	7.0	<5	3.9	11.0	<0.10	<10	<50	<50	<100
P3-15A	P3-15	2019	15	Phase II	0-15	1.0	<0.050	3.4	1.2	**49.0**	1.9	2.8	15.0	<0.010	<3.5	<3.0	**46**	<4.7
	P3-15 depth																	
Not sampled	P3-15	2005	1	Phase I														
P3-15-2	P3-15	2007	3	Phase I	20	**1.79**	<0.5	4.1	<2	4.6	<30	<5	9.0	<0.05	<10	<5	**44**	**50**
P309-15B	P3-15	2009	5	Phase I	20-30	**3.0**	<0.1	3.0	1.0	<5	3.0	3.0	<10	<0.01	<12	<10	**33**	11
SS11-011	P3-15	2011	7	Phase II	40-50	<2	<0.1	8.2	1.2	2.5	<5	**7.7**	10.9	<0.45	<5	N/A	N/A	N/A
P314-15B	P3-15	2014	10	Phase II	20-30	0.6	<0.01	4.0	1.5	4.7	<4.9	2.3	4.0	<0.10	<10	<50	<50	<100
P3-15B	P3-15	2019	15	Phase II	25-35	**1.7**	<0.050	3.7	1.2	6.9	2.6	2.3	6.5	<0.010	<3.5	6.0	**35**	10

TABLE 4

PIN-3 North Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.2**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**16.7**	**16.6**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.00	0.0	0.0	11.2	13.2
Baseline Data Mean + 3x Standard Deviation						**3.4**	**1.0**	**20.0**	**5.0**	**46.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.2**	**56.1**
Downgradient																		
	P3-16 surface																	
05-26698	P3-16	2005	1	Phase I	0	**2.2**	<1	<20	<5	**10.6**	<10	**7.0**	<15	<0.003	<10	7	**27**	**31**
P3-16-1	P3-16	2007	3	Phase I	10	**1.73**	<0.5	3.9	<2	8.4	<30	**6.4**	7.9	<0.05	<10	<5	**78**	**100**
P309-16A	P3-16	2009	5	Phase I	0-15	**2.0**	<0.1	2.0	1.0	6.0	2.0	**6.0**	<10	<0.01	<12	<10	**34**	12
P309-BD3 (Dup)	P3-16	2009	5	Phase I	0-15	**2.0**	<0.1	3.0	1.0	6.0	3.0	**7.0**	<10	<0.01	<12	<10	**26**	10
SS11-007	P3-16	2011	7	Phase II	0-15	<2	<0.1	6.6	1.1	8.0	<5	**10.7**	7.7	<0.45	<5	N/A	N/A	N/A
P314-16A	P3-16	2014	10	Phase II	0-15	**1.8**	0.04	5.6	2.1	**17.6**	<4.9	**9.9**	9.0	<0.10	<10	<50	<50	<100
P3-16A	P3-16	2019	15	Phase II	0-15	**2.9**	<0.050	3.7	1.6	**13.0**	4.8	**7.6**	8.0	<0.010	<3.5	**23**	**100**	**23**
P3-18A (Dup)	P3-16	2019	15	Phase II	0-15	**2.2**	<0.050	3.1	1.5	**11.0**	4.0	**6.1**	7.4	<0.010	<3.5	9.2	**55**	11
	P3-16 depth																	
Not sampled	P3-16	2005	1	Phase I														
P3-16-2	P3-16	2007	3	Phase I	40	**2.12**	<0.5	3.7	<2	6.9	<30	**5.2**	6.5	<0.05	<10	7	**44**	**50**
P309-16B	P3-16	2009	5	Phase I	15-25	**2.0**	<0.1	2.0	1.0	<5	3.0	5.0	<10	<0.01	<12	**13**	**31**	11
SS11-008	P3-16	2011	7	Phase II	40-50	<2	<0.1	15.0	1.5	3.2	<5	**11.1**	10.1	<0.45	<5	N/A	N/A	N/A
SS11-009 (Interlab)	P3-16	2011	7	Phase II	40-50	<1	<0.1	5.0	2.0	<5	2.0	4.0	<10	<0.01	<12	<10	<10	<10
P314-16B	P3-16	2014	10	Phase II	20-30	**2.6**	0.02	3.6	2.3	6.4	5.3	**6.5**	5.0	<0.10	<10	<50	<50	<100
P3-16B	P3-16	2019	15	Phase II	25-35	**1.9**	<0.050	3.4	1.3	**16.0**	3.2	**6.8**	8.0	<0.010	<3.5	5.5	**42**	7.7

N/A = not analyzed

Some 2009 sample intervals appear to have been switched in report (B=shallow, A=depth); where discrepancy exists without explanation, field notes were taken as accurate source.

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

TABLE 5

PIN-3 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.3**	**1.0**	**20.0**	**5.0**	**9.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**69.9**	**97.8**
Baseline Data - Standard Deviation						1.7	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.00	0.0	0.0	71.1	114.5
Baseline Data Mean + 3x Standard Deviation						**6.3**	**1.0**	**20.0**	**5.0**	**22.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**283.1**	**441.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Downgradient (no clear indication of upgradient and downgradient sampling locations, all classified as downgradient)																		
	MW-13 surface																	
05-26688	MW-13	2005	1	Phase I	0	1.1	<1	<20	<5	6.8	<10	<5	<15	<0.003	<10	<4	33	24
P3-MW-13-1	MW-13	2007	3	Phase I	10	0.884	<0.5	5.2	<2	6.0	<30	<5	10.2	<0.01	<10	**11**	**180**	37
P309-13WA	MW-13	2009	5	Phase I	0-15	**3.0**	<0.1	3.0	2.0	5.0	2.0	4.0	<10	<0.01	<12	<10	36	12
SS11-035	MW-13	2011	7	Phase II	0-15	<2	0.1	**74.3**	2.7	7.2	<5	**37.1**	13.8	<0.45	<5	N/A	N/A	N/A
P314-13WA	MW-13	2014	10	Phase II	0-15	1.0	0.11	4.2	2.3	**17.6**	6.3	3.1	12.0	<0.10	<10	<50	<50	<100
P314-BD4 (Dup)	MW-13	2014	10	Phase II	0-15	0.9	0.11	4.5	2.4	8.6	7.1	3.7	11.0	<0.10	<10	<50	<50	<100
P314-13WA (Interlab)	MW-13	2014	10	Phase II	0-15	**1.6**	0.1	**35.0**	1.9	8.9	7.4	**17.0**	<10	<0.01	<12	<10	<50	N/A
MW-13A	MW-13	2019	15	Phase II	0-15	<1.0	0.064	3.6	1.5	6.7	4.1	2.8	6.6	<0.010	<3.5	<3.0	27	<4.7
	MW-13 depth																	
05-26690	MW-13	2005	1	Phase I	30	1.1	<1	<20	<5	6.8	<10	<5	<15	<0.003	<10	<4	12	12
P3-MW-13-2	MW-13	2007	3	Phase I	50	0.998	<0.5	4.4	2.1	8.0	<30	<5	7.0	<0.01	<10	5	**190**	<5
P309-13WB	MW-13	2009	5	Phase I	28-38	**3.0**	<0.1	3.0	2.0	<5	1.0	4.0	<10	<0.01	<12	<10	13	<10
SS11-036	MW-13	2011	7	Phase II	40-50	<2	0.1	**83.4**	3.2	8.2	<5	**40.7**	12.9	<0.45	<5	N/A	N/A	N/A
P314-13WB	MW-13	2014	10	Phase II	40-50	0.8	0.03	2.8	1.7	5.6	<5	2.2	4.0	<0.10	<10	<50	<50	<100
MW-13B	MW-13	2019	15	Phase II	40-50	<1.0	<0.050	3.3	1.4	7.2	1.7	2.5	4.8	<0.010	<3.5	<3.0	25	<4.7
MW-18B (Dup)	MW-13	2019	15	Phase II	40-50	<1.0	<0.050	3.8	1.3	6.9	1.6	2.4	4.1	<0.010	<3.5	3.1	28	6.9

TABLE 5

PIN-3 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.3**	**1.0**	**20.0**	**5.0**	**9.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**69.9**	**97.8**
Baseline Data - Standard Deviation						1.7	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.00	0.0	0.0	71.1	114.5
Baseline Data Mean + 3x Standard Deviation						**6.3**	**1.0**	**20.0**	**5.0**	**22.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**283.1**	**441.4**
Downgradient																		
	MW-14 surface																	
05-26700	MW-14	2005	1	Phase I	0	1.1	<1	<20	<5	9.5	<10	<5	<15	<0.003	<10	10	41	44
P3-MW-14-1	MW-14	2007	3	Phase I	10	1.2	<0.5	3.7	<2	**22.0**	<30	**6.7**	**54.1**	0.01	<10	<5	**110**	**130**
P309-14WA	MW-14	2009	5	Phase I	0-15	**3.0**	<0.1	2.0	<1	<5	1.0	3.0	<10	<0.01	<12	**12**	36	11
P309-BD1 (Dup)	MW-14	2009	5	Phase I	0-15	<1	<0.1	3.0	1.0	<5	1.0	2.0	<10	<0.01	<12	10	37	12
SS11-037	MW-14	2011	7	Phase II	0-15	<2	0.1	<5	<1	5.1	<5	2.9	13.7	<0.45	<5	N/A	N/A	N/A
P314-14WA	MW-14	2014	10	Phase II	0-15	0.7	0.21	2.0	0.9	**10.1**	<4.9	3.2	11.0	<0.10	<10	<50	<50	<100
MW-14A	MW-14	2019	15	Phase II	0-15	**2.0**	<0.050	2.8	1.2	4.4	1.2	2.7	4.2	<0.010	<3.5	<3.0	20	<4.7
	MW-14 depth																	
05-26702	MW-14	2005	1	Phase I	20	**1.5**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	<9	11
P3-MW-14-2	MW-14	2007	3	Phase I	20	**3.3**	<0.5	3.5	<2	3.9	<30	<5	6.7	<0.01	<10	<5	<5	<5
P309-14WB	MW-14	2009	5	Phase I	35-42	1.0	<0.1	2.0	<1	<5	<1	1.0	<10	<0.01	<12	<10	16	<10
SS11-038	MW-14	2011	7	Phase II	40-50	<2	0.1	**41.0**	1.4	5.9	<5	**20.8**	12.1	<0.45	<5	N/A	N/A	N/A
P314-14WB	MW-14	2014	10	Phase II	30-40	1.3	0.02	2.7	1.3	1.6	<4.9	1.9	3.0	<0.10	<10	<50	<50	<100
MW-14B	MW-14	2019	15	Phase II	20-30	**2.1**	<0.050	2.9	1.2	4.2	1.2	3.1	4.9	<0.010	<3.5	<3.0	11	<4.7
MW-19B (Dup)	MW-14	2019	15	Phase II	20-30	**2.0**	<0.050	3.0	1.3	3.7	1.0	2.8	4.0	<0.010	<3.5	<2.0	17	<3.9

TABLE 5

PIN-3 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.3**	**1.0**	**20.0**	**5.0**	**9.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**69.9**	**97.8**
Baseline Data - Standard Deviation						1.7	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.00	0.0	0.0	71.1	114.5
Baseline Data Mean + 3x Standard Deviation						**6.3**	**1.0**	**20.0**	**5.0**	**22.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**283.1**	**441.4**
Downgradient																		
	MW-15 surface																	
05-2694	MW-15	2005	1	Phase I	0	1.1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	6.9	44	34
P3-MW-15-1	MW-15	2007	3	Phase I	10	0.489	<0.5	3.6	<2	9.1	<30	<5	10.0	<0.01	<10	<5	12	17
P309-15WA	MW-15	2009	5	Phase I	0-15	<1	<0.1	1.0	<1	<5	<1	1.0	<10	<0.01	<12	<10	36	<10
SS11-039	MW-15	2011	7	Phase II	0-15	<2	<0.1	**65.2**	3.4	8.5	<5	**33.9**	**16.3**	<0.45	<5	N/A	N/A	N/A
P314-15WA	MW-15	2014	10	Phase II	0-15	0.6	0.07	2.6	1.4	8.1	6.4	2.3	11.0	<0.10	<10	<50	<50	<100
MW-15A	MW-15	2019	15	Phase II	0-15	<1.0	<0.050	2.6	1.2	5.7	0.97	2.0	5.2	<0.010	<3.5	<3.0	20	<4.7
	MW-15 depth																	
05-2696	MW-15	2005	1	Phase I	30	<1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	5	<9	<8
P3-MW-15-2	MW-15	2007	3	Phase I	50	0.957	<0.5	4.2	<2	8.8	<30	<5	5.5	<0.01	<10	<5	<5	<5
P3-19-2 (Dup)	MW-15	2007	3	Phase I	50	1.07	<0.5	4.2	2.1	6.2	<30	<5	7.1	<0.05	<10	<5	<5	8
P3-19-2 (Interlab)	MW-15	2007	3	Phase I	50	<10	<0.5	4.0	2.0	3.0	<5	3.0	6.0	<0.03	<5	<80	<250	N/A
P309-15WB	MW-15	2009	5	Phase I	40-50	<1	<0.1	2.0	1.0	<5	2.0	2.0	<10	<0.01	<12	<10	20	<10
SS11-041	MW-15	2011	7	Phase II	40-50	<2	0.2	**48.2**	3.4	**14.6**	<5	**26.3**	**19.3**	<0.45	<5	N/A	N/A	N/A
P314-15WB	MW-15	2014	10	Phase II	40-50	0.9	0.06	4.4	2.0	5.1	<5	2.9	6.0	<0.10	<10	<50	<50	<100
MW-15B	MW-15	2019	15	Phase II	30-40	<1.0	<0.050	4.1	1.4	6.7	1.5	2.4	5.6	<0.010	<3.5	<3.0	14	<4.7

TABLE 5

PIN-3 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.3**	**1.0**	**20.0**	**5.0**	**9.6**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**69.9**	**97.8**
Baseline Data - Standard Deviation						1.7	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.00	0.0	0.0	71.1	114.5
Baseline Data Mean + 3x Standard Deviation						**6.3**	**1.0**	**20.0**	**5.0**	**22.0**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**283.1**	**441.4**
Downgradient																		
	MW-16 surface																	
05-2692	MW-16	2005	1	Phase I	0	1.1	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	4.1	29	22
P3-MW-16-1	MW-16	2007	3	Phase I	10	1.1	<0.5	4.2	<2	6.9	<30	<5	9.0	<0.01	<10	<5	19	<5
P3-MW-16-2 (Dup)^	MW-16	2007	3	Phase I	15	1.07	<0.5	3.6	<2	4.4	<30	<5	7.4	<0.01	<10	<5	39	11
P309-16WA	MW-16	2009	5	Phase I	0-15	<1	<0.1	2.0	<1	<5	2.0	2.0	<10	<0.01	<12	<10	45	15
SS11-033	MW-16	2011	7	Phase II	0-15	<2	0.1	12.8	1.2	5.6	<5	**9.0**	**17.6**	<0.45	<5	N/A	N/A	N/A
P314-16WA	MW-16	2014	10	Phase II	0-15	0.8	0.08	2.5	1.3	3.1	<5	2.0	7.0	<0.10	<10	<50	<50	<100
MW-16A	MW-16	2019	15	Phase II	0-15	<1.0	0.057	2.6	0.98	4.1	1.9	2.2	7.9	<0.010	<3.5	<3.0	**84**	<4.7
	MW-16 depth																	
Not sampled - refusal	MW-16	2005	1	Phase I														
Not sampled - refusal	MW-16	2007	3	Phase I														
Not sampled - refusal	MW-16	2009	5	Phase I														
SS11-034	MW-16	2011	7	Phase II	30-40	<2	<0.1	16.3	1.5	3.0	<5	**9.4**	10.0	<0.45	<5	N/A	N/A	N/A
Not sampled - refusal	MW-16	2014	10	Phase II														
MW-16B	MW-16	2019	15	Phase II	15-25	<1.0	<0.050	2.3	0.82	2.0	1.5	1.8	4.4	<0.010	<3.5	<3.0	19	<4.7

Legend

XX **Sample exceeds baseline mean**

XX **Sample exceeds baseline mean + 3x SD**

N/A = not analyzed

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

Some 2011 interlab duplicate TPH results reported as F1-F4 fractions.

^P3-MW-16-2 was collected as the depth sample for MW-16. However, bedrock was encountered at 15 cm, 5 cm below the surface sample; therefore sample was considered as a duplicate of the surface sample.

TABLE 5A

PIN-3 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
03-9618	MW-13	2003			<0.0030	<0.0010	0.0140	<0.0030	0.0100	<0.0100	0.0080	0.0150	N/A	N/A	N/A	N/A
04-15426	MW-13	2004			0.0040	<0.0010	0.0550	<0.0030	0.0140	<0.0100	0.0280	0.0330	<0.05	<0.5	<1.0	<1.0
04-15427	MW-14	2004			0.0060	<0.0010	0.0850	0.0040	0.0100	<0.0100	0.0400	0.0170	<0.05	<0.5	<1.0	<1.0
04-15428	MW-15	2004			<0.0030	<0.0010	0.0130	<0.0030	0.0190	<0.0100	0.0130	0.0260	<0.05	<0.5	<1.0	<1.0
04-15430	MW-16	2004			<0.0030	<0.0010	0.0380	<0.0030	0.0080	<0.0100	0.0170	<0.0100	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0029	0.0005	0.0410	0.0020	0.0122	0.0050	0.0212	0.0192	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0410**	**0.0030**	**0.0122**	**0.0100**	**0.0212**	**0.0192**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0302	0.0000	0.0044	0.0000	0.0128	0.0107	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1317**	**0.0030**	**0.0253**	**0.0100**	**0.0597**	**0.0514**	**0.05**	**0.5**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Monitoring Data																
Downgradient - MW-13 (no clear indication of upgradient and downgradient sampling locations, all classified as downgradient)																
05-26738	MW-13	2005	1	Phase I	<0.0030	<0.0010	0.0330	<0.0030	0.0110	<0.010	0.0170	**0.0280**	<0.05	<0.5	<1.0	<1.0
Not sampled - insufficient volume	MW-13	2007	3	Phase I												
P309-13W	MW-13	2009	5	Phase I	0.0013	0.00005	0.0070	0.0010	0.0047	0.0091	0.0071	**0.2500**	<0.1	<0.1	<0.1	N/A
WS11-009	MW-13	2011	7	Phase II	<0.0010	<0.00050	0.0200	<0.0010	<0.0020	<0.0010	0.0050	**0.1200**	<0.5	N/A	N/A	N/A
P314-13W	MW-13	2014	10	Phase II	**0.0045**	<0.00001	**0.1760**	0.0016	**0.0170**	0.0022	**0.0595**	**0.3710**	<0.2	0.20	<0.1	<0.1
MW-13	MW-13	2019	15	Phase II	0.0005	<0.000020	0.0043	<0.00030	0.0022	0.0004	0.0040	**0.0320**	**0.053**	<0.020	0.046	<0.055

TABLE 5A

PIN-3 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
03-9618	MW-13	2003			<0.0030	<0.0010	0.0140	<0.0030	0.0100	<0.0100	0.0080	0.0150	N/A	N/A	N/A	N/A
04-15426	MW-13	2004			0.0040	<0.0010	0.0550	<0.0030	0.0140	<0.0100	0.0280	0.0330	<0.05	<0.5	<1.0	<1.0
04-15427	MW-14	2004			0.0060	<0.0010	0.0850	0.0040	0.0100	<0.0100	0.0400	0.0170	<0.05	<0.5	<1.0	<1.0
04-15428	MW-15	2004			<0.0030	<0.0010	0.0130	<0.0030	0.0190	<0.0100	0.0130	0.0260	<0.05	<0.5	<1.0	<1.0
04-15430	MW-16	2004			<0.0030	<0.0010	0.0380	<0.0030	0.0080	<0.0100	0.0170	<0.0100	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0029	0.0005	0.0410	0.0020	0.0122	0.0050	0.0212	0.0192	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0410**	**0.0030**	**0.0122**	**0.0100**	**0.0212**	**0.0192**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0302	0.0000	0.0044	0.0000	0.0128	0.0107	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1317**	**0.0030**	**0.0253**	**0.0100**	**0.0597**	**0.0514**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-14																
05-26739	MW-14	2005	1	Phase I	**0.0039**	<0.0010	**0.0710**	**0.0036**	0.0082	<0.010	**0.0310**	0.0130	<0.05	<0.5	<1.0	<1.0
P3-MW-14	MW-14	2007	3	Phase I	<0.0025	0.00025	0.0155	<0.0015	<0.0050	<0.0025	0.0156	<0.025	<0.1	N/A	N/A	N/A
P309-14W	MW-14	2009	5	Phase I	**0.0150**	0.00011	**0.3300**	**0.0083**	**0.0210**	**0.0150**	**0.1100**	0.0150	<0.1	<0.1	<0.1	N/A
WS11-008	MW-14	2011	7	Phase II	<0.0010	<0.0005	<0.020	<0.0010	<0.0020	<0.0010	0.0130	**0.0500**	<0.5	N/A	N/A	N/A
P314-14W	MW-14	2014	10	Phase II	**0.0186**	0.00002	**0.2700**	**0.0094**	**0.0320**	**0.0147**	**0.0989**	**0.0250**	<0.2	<0.2	<0.1	<0.1
MW-14	MW-14	2019	15	Phase II	0.00087	<0.000020	0.0065	0.00033	0.0012	0.00035	0.0052	<0.0030	**0.071**	<0.020	<0.043	<0.055

TABLE 5A

PIN-3 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
03-9618	MW-13	2003			<0.0030	<0.0010	0.0140	<0.0030	0.0100	<0.0100	0.0080	0.0150	N/A	N/A	N/A	N/A
04-15426	MW-13	2004			0.0040	<0.0010	0.0550	<0.0030	0.0140	<0.0100	0.0280	0.0330	<0.05	<0.5	<1.0	<1.0
04-15427	MW-14	2004			0.0060	<0.0010	0.0850	0.0040	0.0100	<0.0100	0.0400	0.0170	<0.05	<0.5	<1.0	<1.0
04-15428	MW-15	2004			<0.0030	<0.0010	0.0130	<0.0030	0.0190	<0.0100	0.0130	0.0260	<0.05	<0.5	<1.0	<1.0
04-15430	MW-16	2004			<0.0030	<0.0010	0.0380	<0.0030	0.0080	<0.0100	0.0170	<0.0100	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0029	0.0005	0.0410	0.0020	0.0122	0.0050	0.0212	0.0192	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0410**	**0.0030**	**0.0122**	**0.0100**	**0.0212**	**0.0192**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0302	0.0000	0.0044	0.0000	0.0128	0.0107	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1317**	**0.0030**	**0.0253**	**0.0100**	**0.0597**	**0.0514**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-15																
05-26741	MW-15	2005	1	Phase I	<0.0030	<0.001	0.0150	<0.0030	**0.0220**	**0.0120**	**0.0320**	**0.0310**	<0.05	<0.5	<1.0	<1.0
05-26740 (Dup)	MW-15	2005	1	Phase I	**0.0100**	<0.001	**0.0900**	**0.0040**	0.0080	<0.010	**0.0400**	0.0100	<0.05	<0.5	<1.0	<1.0
P3-MW-15	MW-15	2007	3	Phase I	<0.0025	<0.000085	<0.0050	**0.0095**	<0.0050	<0.0025	0.0154	<0.025	<0.1	N/A	N/A	N/A
P309-15W	MW-15	2009	5	Phase I	0.0018	0.000036	0.0040	0.0016	**0.0140**	0.0095	0.0061	**0.0280**	<0.1	<0.1	<0.1	N/A
WS11-006	MW-15	2011	7	Phase II	0.0030	<0.0005	<0.020	0.0010	<0.0020	<0.0010	0.0200	**0.0900**	<0.5	N/A	N/A	N/A
WS11-007 (Dup)	MW-15	2011	7	Phase II	0.0030	<0.0005	<0.020	0.0010	<0.0020	<0.0010	0.0210	**0.1000**	<0.5	N/A	N/A	N/A
WS11-006 (Interlab)	MW-15	2011	7	Phase II	0.0007	0.000016	<0.0010	0.0007	0.0022	0.0003	0.0075	<0.0030	<0.1	<0.1	<0.1	<0.1
P314-15W	MW-15	2014	10	Phase II	**0.0069**	<0.00001	0.0377	0.0020	0.0090	**0.0120**	**0.0224**	**0.0260**	<0.2	0.20	<0.1	0.10
MW-15	MW-15	2019	15	Phase II	0.00054	<0.000020	<0.0010	0.00075	0.0051	0.00044	0.0049	0.0100	<0.015	<0.020	<0.043	<0.055

TABLE 5A

PIN-3 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
03-9618	MW-13	2003			<0.0030	<0.0010	0.0140	<0.0030	0.0100	<0.0100	0.0080	0.0150	N/A	N/A	N/A	N/A
04-15426	MW-13	2004			0.0040	<0.0010	0.0550	<0.0030	0.0140	<0.0100	0.0280	0.0330	<0.05	<0.5	<1.0	<1.0
04-15427	MW-14	2004			0.0060	<0.0010	0.0850	0.0040	0.0100	<0.0100	0.0400	0.0170	<0.05	<0.5	<1.0	<1.0
04-15428	MW-15	2004			<0.0030	<0.0010	0.0130	<0.0030	0.0190	<0.0100	0.0130	0.0260	<0.05	<0.5	<1.0	<1.0
04-15430	MW-16	2004			<0.0030	<0.0010	0.0380	<0.0030	0.0080	<0.0100	0.0170	<0.0100	<0.05	<0.5	<1.0	<1.0
				N value	5	5	5	5	5	5	5	5	4	4	4	4
Baseline Data - Arithmetic Mean					0.0029	0.0005	0.0410	0.0020	0.0122	0.0050	0.0212	0.0192	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.0410**	**0.0030**	**0.0122**	**0.0100**	**0.0212**	**0.0192**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0302	0.0000	0.0044	0.0000	0.0128	0.0107	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0030**	**0.0010**	**0.1317**	**0.0030**	**0.0253**	**0.0100**	**0.0597**	**0.0514**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-16																
05-26742	MW-16	2005	1	Phase I	<0.0030	<0.0010	**0.0490**	<0.0030	0.0096	<0.010	0.0210	0.0130	<0.05	<0.5	<1.0	<1.0
P3-MW-16	MW-16	2007	3	Phase I	<0.0025	0.000297	0.0089	<0.0015	<0.0050	<0.0025	0.0061	<0.025	<0.1	N/A	N/A	N/A
P309-16W	MW-16	2009	5	Phase I	0.0029	0.000047	**0.0620**	0.0014	0.0074	0.0052	0.0210	0.0050	<0.1	<0.1	<0.1	N/A
WS11-010	MW-16	2011	7	Phase II	**0.0040**	<0.0005	<0.020	<0.0010	<0.0020	<0.0010	0.0130	**0.0400**	<0.5	N/A	N/A	N/A
P314-16W	MW-16	2014	10	Phase II	0.0019	<0.00001	0.0363	0.0008	0.0110	0.0021	**0.0215**	0.0050	<0.2	0.20	<0.1	<0.1
MW-16	MW-16	2019	15	Phase II	0.00057	<0.000020	0.0130	<0.00030	0.0038	0.00062	0.0075	<0.0030	**0.071**	<0.020	<0.043	<0.055

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

N/A = not analyzed

2007 hydrocarbons analyzed as Total Extractable Hydrocarbons.

2008 hydrocarbons analyzed at TPH plus F1 fraction HCs.

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

TABLE 6

PIN-3 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3* C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**15.2**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	10.9	0.0	1.8	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**47.9**	**10.0**	**10.3**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	MW-9 surface																	
05-26680	MW-9	2005	1	Phase I	0	**1.4**	<1	<20	<5	**18.0**	<10	<5	<15	0.0033	<10	6.8	9.1	<8
TP-9	MW-9	2006	2	Phase I	10	**1.52**	<0.5	6.3	2.8	9.1	3.3	<5	9.9	<0.01	<10	<5	<5	<5
P3-MW-9-1	MW-9	2007	3	Phase I	10	**1.31**	<0.5	5.7	2.8	10.0	<30	<5	9.0	<0.01	<10	<5	20	<5
P3-MW-9A	MW-9	2008	4	Phase I	10	<5	<0.5	6.8	2.5	8.4	3.2	<5	4.7	<0.05	<10	<30	<50	N/A
P309-9WA	MW-9	2009	5	Phase I	0-15	<1	<0.1	9.0	2.0	6.0	2.0	**9.0**	<10	<0.01	<12	<10	27	11
SS11-042	MW-9	2011	7	Phase II	0-15	<2	<0.1	**20.7**	3.2	9.3	<5	**14.5**	**15.6**	<0.45	<5	N/A	N/A	N/A
P314-9WA	MW-9	2014	10	Phase II	0-15	**1.4**	0.01	7.1	2.8	7.2	<4.9	3.7	7.0	<0.10	<10	<50	<50	<100
MW-9A	MW-9	2019	15	Phase II	0-15	**1.4**	<0.050	4.9	2.3	13.0	3.1	4.2	6.9	<0.010	<3.5	3.5	24	6.9
	MW-9 depth																	
05-26682	MW-9	2005	1	Phase I	30	**1.4**	<1	<20	<5	12.4	<10	<5	<15	0.0038	<10	<4	14	8
TP-10	MW-9	2006	2	Phase I	50	**1.53**	<0.5	5.3	2.8	10.3	3.1	<5	10.8	<0.01	<10	<5	<5	<5
P3-MW-9-2	MW-9	2007	3	Phase I	50	**1.57**	<0.5	5.8	3.1	14.0	<30	**5.2**	**16.4**	<0.01	<10	<5	31	21
P3-MW-9B	MW-9	2008	4	Phase I	50	<5	<0.5	5.4	2.7	10.0	3.8	<5	5.3	<0.05	<10	<30	<50	N/A
P309-9WB	MW-9	2009	5	Phase I	40-50	<1	<0.1	**27.0**	4.0	14.0	2.0	**21.0**	<10	<0.01	<12	<10	14	<10
S11-044	MW-9	2011	7	Phase II	40-50	<2	<0.1	**31.7**	3.3	8.8	<5	**19.6**	13.8	<0.45	<5	N/A	N/A	N/A
P314-9WB	MW-9	2014	10	Phase II	40-50	**1.4**	<0.01	5.0	2.9	7.0	<5	3.9	6.0	<0.10	<10	<50	<50	<100
MW-9B	MW-9	2019	15	Phase II	40-50	**1.5**	<0.050	5.5	2.3	**21.0**	7.4	4.6	11.0	<0.010	<3.5	3.2	48	13

TABLE 6

PIN-3 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3* C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**15.2**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	10.9	0.0	1.8	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**47.9**	**10.0**	**10.3**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Downgradient																		
	MW-10 surface																	
05-26684	MW-10	2005	1	Phase I	0	**1.5**	<1	<20	<5	**33.6**	<10	**5.1**	<15	<0.003	**11**	6.4	34	22
TP-11	MW-10	2006	2	Phase I	10	**1.04**	<0.5	3.7	<2	6.8	<2	<5	4.5	<0.01	<10	<5	9	10
P3-MW-10-1	MW-10	2007	3	Phase I	10	0.891	<0.5	5.9	2.2	11.9	<30	<5	7.2	<0.01	<10	<5	29	17
P3-MW-10A	MW-10	2008	4	Phase I	10	<5	<0.5	4.7	2.1	**20.5**	**11.7**	**5.4**	13.0	<0.05	<10	<30	**57**	N/A
P309-10WA	MW-10	2009	5	Phase I	0-15	**4.0**	<0.1	15.0	2.0	8.0	2.0	**9.0**	<10	<0.01	<12	<10	21	<10
SS11-050	MW-10	2011	7	Phase II	0-15	<2	<0.1	16.2	2.4	5.1	<5	**10.8**	10.1	<0.45	<5	N/A	N/A	N/A
SS11-071 (Dup)	MW-10	2011	7	Phase II	0-15	<2	<0.1	13.8	2.1	5.1	<5	**8.4**	8.8	<0.45	<5	N/A	N/A	N/A
P314-10WA	MW-10	2014	10	Phase II	0-15	1.0	0.1	4.2	1.7	**56.5**	<4.9	**8.2**	5.0	<0.10	<10	<50	**52**	<100
MW-10A	MW-10	2019	15	Phase II	0-15	**1.1**	<0.050	4.5	2.0	7.1	1.4	3.6	5.3	<0.010	<3.5	<3.0	19	<4.7
	MW-10 depth																	
05-26686	MW-10	2005	1	Phase I	30	**2.3**	<1	<20	<5	7.4	<10	<5	<15	<0.003	<10	5.4	<9	<8
TP-12	MW-10	2006	2	Phase I	50	**1.43**	<0.5	6.8	3.3	11.8	2.1	**6.2**	10.7	<0.01	<10	<5	10	<5
P3-MW-10-2	MW-10	2007	3	Phase I	50	**1.09**	<0.5	5.2	2.3	9.8	<30	<5	6.6	<0.01	<10	<5	14	<5
P3-MW-10B	MW-10	2008	4	Phase I	50	<5	<0.5	4.8	2.2	8.4	<2	<5	4.2	<0.05	<10	<30	<50	N/A
P309-10WB	MW-10	2009	5	Phase I	40-50	**3.0**	<0.1	9.0	2.0	<5	1.0	**6.0**	<10	<0.01	<12	**12**	25	<10
SS11-051	MW-10	2011	7	Phase II	40-50	<2	<0.1	6.3	1.9	4.9	<5	**5.6**	9.5	<0.45	<5	N/A	N/A	N/A
SS11-072 (Dup)	MW-10	2011	7	Phase II	40-50	<2	<0.1	18.6	2.0	6.1	<5	**10.7**	8.6	<0.45	<5	N/A	N/A	N/A
P314-10WB	MW-10	2014	10	Phase II	40-50	**1.1**	<0.01	3.3	2.1	4.3	<5	2.9	4.0	<0.10	<10	<50	<50	<100
MW-10B	MW-10	2019	15	Phase II	40-50	<1.0	<0.050	3.2	1.5	6.5	1.1	2.8	4.1	<0.010	<3.5	<3.0	14	<4.7

TABLE 6

PIN-3 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3* C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**15.2**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	10.9	0.0	1.8	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**47.9**	**10.0**	**10.3**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Downgradient																		
	MW-11 surface																	
05-26676	MW-11	2005	1	Phase I	0	**1.1**	<1	<20	<5	6.0	<10	<5	<15	<0.003	<10	<4	45	32
TP-13	MW-11	2006	2	Phase I	10	0.934	<0.5	4.8	<2	12.9	2.1	<5	10.2	<0.02	<10	<5	50	**74**
TP-19 (Interlab)	MW-11	2006	2	Phase I	10	0.7	0.2	6.0	1.8	**17.5**	5.6	**18.1**	5.0	<0.10	<10	<50	<50	<50
P3-MW-11-1	MW-11	2007	3	Phase I	10	0.679	<0.5	4.6	2.0	4.9	<30	<5	5.4	<0.01	<10	**13**	41	23
P3-MW-11A	MW-11	2008	4	Phase I	10	<5	<0.5	3.8	<2	4.7	<2	<5	4.2	<0.05	<10	<30	<50	N/A
P309-11WA	MW-11	2009	5	Phase I	0-15	1.0	<0.1	3.0	1.0	7.0	<1	3.0	<10	<0.01	<12	<10	28	11
SS11-048	MW-11	2011	7	Phase II	0-15	<2	<0.1	**22.9**	3.7	7.6	<5	**12.1**	**46.9**	<0.45	<5	N/A	N/A	N/A
SS11-073 (Dup)	MW-11	2011	7	Phase II	0-15	<2	<0.1	6.4	1.6	4.3	<5	4.9	8.6	<0.45	<5	N/A	N/A	N/A
P314-11WA	MW-11	2014	10	Phase II	0-15	0.7	0.02	2.8	1.5	**15.9**	<4.9	3.4	4.0	<0.10	<10	<50	<50	<100
MW-11A	MW-11	2019	15	Phase II	0-15	<1.0	<0.050	4.4	1.8	11.0	7.3	3.6	9.3	<0.010	<3.5	4.8	**68**	17
	MW-11 depth																	
05-26678	MW-11	2005	1	Phase I	30	**1.3**	<1	<20	<5	<5	<10	<5	<15	<0.003	<10	<4	10	<8
TP-14	MW-11	2006	2	Phase I	50	0.865	<0.5	4.5	<2	6.1	<2	<5	6.7	<0.01	<10	<5	<5	<5
TP-20 (Interlab)	MW-11	2006	2	Phase I	50	**1.3**	<0.05	7.0	2.4	7.0	2.4	**17.7**	7.0	<0.10	<10	<50	<50	<50
P3-MW-11-2	MW-11	2007	3	Phase I	50	0.904	<0.5	4.7	2.3	7.4	<30	<5	7.1	<0.01	<10	<5	<5	<5
P3-18-2 (Dup)	MW-11	2007	3	Phase I	50	0.777	<0.5	4.6	<2	7.0	<30	<5	5.0	<0.05	<10	<5	<5	12
P3-18-2 (Interlab)	MW-11	2007	3	Phase I	50	<10	<0.5	3.0	2.0	6.0	<5	3.0	5.0	<0.03	<5	<80	<250	N/A
P3-MW-11B	MW-11	2008	4	Phase I	50	<5	<0.5	4.0	<2	5.0	<2	<5	5.1	<0.05	<10	<30	<50	N/A
P309-11WB	MW-11	2009	5	Phase I	40-50	**4.0**	<0.1	3.0	2.0	<5	1.0	5.0	<10	<0.01	<12	<10	22	<10
SS11-049	MW-11	2011	7	Phase II	40-50	<2	<0.1	<5	1.0	2.3	<5	2.3	6.6	<0.45	<5	N/A	N/A	N/A
SS11-074 (Dup)	MW-11	2011	7	Phase II	40-50	<2	<0.1	<5	1.3	3.7	<5	3.4	7.6	<0.45	<5	N/A	N/A	N/A
P314-11WB	MW-11	2014	10	Phase II	40-50	0.9	<0.01	4.4	2.5	4.5	<5	3.8	9.0	<0.10	<10	<50	<50	<100
P314-BD6 (Dup)	MW-11	2014	10	Phase II	40-50	0.9	<0.01	4.1	1.9	4.4	<4.9	3.2	4.0	<0.10	<10	<50	<50	<100
P314-11WB (Interlab)	MW-11	2014	10	Phase II	40-50	**1.1**	<0.1	**22.0**	2.0	<5	1.5	**11.0**	<10	<0.01	<12	<10	<50	N/A
MW-11B	MW-11	2019	15	Phase II	40-50	<1.0	<0.050	3.8	1.6	6.6	1.2	3.0	4.8	<0.010	<3.5	<3.0	9.7	<4.7

TABLE 6

PIN-3 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C_6-C_{10} (mg/kg)	F2* C_{10}-C_{16} (mg/kg)	F3* C_{16}-C_{34} (mg/kg)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**1.0**	**1.0**	**20.0**	**5.0**	**15.2**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Baseline Data - Standard Deviation						0.0	0.0	0.0	0.0	10.9	0.0	1.8	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**1.0**	**1.0**	**20.0**	**5.0**	**47.9**	**10.0**	**10.3**	**15.0**	**0.10**	**10.0**	**10.0**	**50.0**	**50.0**
Downgradient																		
	MW-12 surface																	
05-26672	MW-12	2005	1	Phase I	0	**2.8**	<1	<20	<5	**25.3**	<10	**7.3**	**21.9**	<0.003	**17**	**16**	**740**	**410**
TP-15	MW-12	2006	2	Phase I	10	**1.5**	<0.5	6.0	3.2	11.0	3.8	**5.6**	9.8	<0.01	<10	<5	16	14
P3-MW-12-1	MW-12	2007	3	Phase I	10	**1.63**	<0.5	5.8	<2	**21.6**	<30	<5	**27.7**	<0.01	<10	<5	**190**	**230**
P3-MW-12A	MW-12	2008	4	Phase I	10	<5	<0.5	5.3	3.1	**41.9**	**22.4**	**7.5**	**18.9**	<0.090	<10	<30	**77**	N/A
P309-12WA	MW-12	2009	5	Phase I	0-15	1.0	<0.1	3.0	1.0	**16.0**	1.0	4.0	<10	<0.01	<12	<10	35	11
SS11-045	MW-12	2011	7	Phase II	0-15	<2	<0.1	10.5	2.3	9.2	<5	**7.3**	13.1	<0.45	<5	N/A	N/A	N/A
P314-12WA	MW-12	2014	10	Phase II	0-15	**1.5**	0.12	4.3	1.9	**71.6**	<4.9	**9.1**	8.0	<0.10	<10	<50	<50	<100
MW-12A	MW-12	2019	15	Phase II	0-15	<1.0	<0.050	3.1	1.3	6.3	1.1	2.7	3.7	<0.010	<3.5	<3.0	8.4	<4.7
	MW-12 depth																	
05-26674	MW-12	2005	1	Phase I	30	**1.5**	<1	<20	<5	6.7	<10	**5.2**	<15	<0.003	<10	<4	10	12
TP-16	MW-12	2006	2	Phase I	50	**1.19**	<0.5	7.8	3.4	8.8	2.2	**6.1**	10.5	<0.01	<10	<5	<5	<5
P3-MW-12-2	MW-12	2007	3	Phase I	50	**1.03**	<0.5	4.3	2.1	6.4	<30	<5	6.0	<0.01	<10	<5	<5	<5
P3-MW-12B	MW-12	2008	4	Phase I	50	<5	<0.5	7.5	3.1	**16.2**	2.6	<5	6.5	<0.05	<10	<30	<50	N/A
P309-12WB	MW-12	2009	5	Phase I	40-15	**3.0**	<0.1	5.0	2.0	6.0	2.0	5.0	<10	<0.01	<12	<10	26	<10
SS11-047	MW-12	2011	7	Phase II	40-50	<2	<0.1	15.1	2.8	10.6	<5	**10.6**	13.5	<0.45	<5	N/A	N/A	N/A
P314-12WB	MW-12	2014	10	Phase II	40-50	0.9	<0.01	3.8	2.7	10.7	<4.9	3.6	6.0	<0.10	<10	<50	<50	<100
MW-12B	MW-12	2019	15	Phase II	40-50	**1.1**	<0.050	4.5	2.2	13.0	1.3	4.0	6.5	<0.010	<3.5	<3.0	12	<4.7
MW-17B (Dup)	MW-12	2019	15	Phase II	40-50	<1.0	<0.050	3.9	2.0	12.0	1.2	4.0	5.7	<0.010	<3.5	3.0	19	<4.7

N/A = not analyzed

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

Some 2011 interlab duplicate TPH results reported as F1-F4 fractions.

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

TABLE 6A

PIN-3 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
04-15419	MW-11	2004			0.0150	<0.0010	0.0870	0.0190	0.2230	0.2300	0.0520	0.1750	<0.05	<0.5	<1.0	<1.0
04-15420	MW-12	2004			0.0150	<0.0010	0.1340	0.0230	0.3930	0.8250	0.0770	0.8780	<0.05	<0.5	<1.0	<1.0
				N value	2	2	2	2	2	2	2	2	2	2	2	2
Baseline Data - Arithmetic Mean					0.0150	0.0005	0.1105	0.0210	0.3080	0.5275	0.0645	0.5265	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0150**	**0.0010**	**0.1105**	**0.0210**	**0.3080**	**0.5275**	**0.0645**	**0.5265**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0332	0.0028	0.1202	0.4207	0.0177	0.4971	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0150**	**0.0010**	**0.2102**	**0.0295**	**0.6686**	**1.79**	**0.1175**	**2.02**	**0.05**	**0.5**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Monitoring Data																
Upgradient - MW-9																
Not sampled - dry/frozen	MW-9	2005	1	Phase I												
Not sampled - dry/frozen	MW-9	2006	2	Phase I												
Not sampled - dry/frozen	MW-9	2007	3	Phase I												
Not sampled - dry/frozen	MW-9	2008	4	Phase I												
Not sampled - dry/frozen	MW-9	2009	5	Phase I												
Not sampled - dry/frozen	MW-9	2011	7	Phase II												
Not sampled - dry/frozen	MW-9	2014	10	Phase II												
Not sampled - dry/frozen	MW-9	2019	15	Phase II												

TABLE 6A

PIN-3 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
04-15419	MW-11	2004			0.0150	<0.0010	0.0870	0.0190	0.2230	0.2300	0.0520	0.1750	<0.05	<0.5	<1.0	<1.0
04-15420	MW-12	2004			0.0150	<0.0010	0.1340	0.0230	0.3930	0.8250	0.0770	0.8780	<0.05	<0.5	<1.0	<1.0
				N value	2	2	2	2	2	2	2	2	2	2	2	2
Baseline Data - Arithmetic Mean					0.0150	0.0005	0.1105	0.0210	0.3080	0.5275	0.0645	0.5265	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0150**	**0.0010**	**0.1105**	**0.0210**	**0.3080**	**0.5275**	**0.0645**	**0.5265**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0332	0.0028	0.1202	0.4207	0.0177	0.4971	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0150**	**0.0010**	**0.2102**	**0.0295**	**0.6686**	**1.79**	**0.1175**	**2.02**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-10																
Not sampled - dry/frozen	MW-10	2005	1	Phase I												
Not sampled - dry/frozen	MW-10	2006	2	Phase I												
Not sampled - dry/frozen	MW-10	2007	3	Phase I												
Not sampled - dry/frozen	MW-10	2008	4	Phase I												
Not sampled - dry/frozen	MW-10	2009	5	Phase I												
Not sampled - dry/frozen	MW-10	2011	7	Phase II												
Not sampled - dry/frozen	MW-10	2014	10	Phase II												
MW-10	MW-10	2019	15	Phase II	0.00021	<0.000020	<0.0010	<0.00030	0.0032	0.0010	0.0013	0.0120	0.041	<0.020	<0.043	<0.055

TABLE 6A

PIN-3 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
04-15419	MW-11	2004			0.0150	<0.0010	0.0870	0.0190	0.2230	0.2300	0.0520	0.1750	<0.05	<0.5	<1.0	<1.0
04-15420	MW-12	2004			0.0150	<0.0010	0.1340	0.0230	0.3930	0.8250	0.0770	0.8780	<0.05	<0.5	<1.0	<1.0
				N value	2	2	2	2	2	2	2	2	2	2	2	2
Baseline Data - Arithmetic Mean					0.0150	0.0005	0.1105	0.0210	0.3080	0.5275	0.0645	0.5265	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0150**	**0.0010**	**0.1105**	**0.0210**	**0.3080**	**0.5275**	**0.0645**	**0.5265**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0332	0.0028	0.1202	0.4207	0.0177	0.4971	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0150**	**0.0010**	**0.2102**	**0.0295**	**0.6686**	**1.79**	**0.1175**	**2.02**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-11																
Not sampled - insufficient volume	MW-11	2005	1	Phase I												
MW-5	MW-11	2006	2	Phase I	<0.0050	<0.000085	0.0127	<0.0015	<0.0050	0.0035	0.0052	0.0280	<0.1	<0.25	<0.25	N/A
MW-6 (Dup)	MW-11	2006	2	Phase I	<0.0070	<0.00017	<0.0100	<0.0030	<0.0100	<0.0050	<0.010	0.0540	<0.1	<0.25	<0.25	N/A
MW-7 (Interlab)	MW-11	2006	2	Phase I	<0.0010	0.00005	<0.0010	0.0007	0.0017	0.0030	<0.0080	0.0410	<0.1	<0.08	<0.08	N/A
P3-MW-11	MW-11	2007	3	Phase I	<0.0250	<0.00085	<0.0500	<0.0150	<0.0500	<0.0250	<0.0500	<0.25	<0.1	N/A	N/A	N/A
P3-MW-18 (Dup)	MW-11	2007	3	Phase I	<0.0250	<0.00085	<0.0500	<0.0150	<0.0500	<0.0250	<0.0500	<0.25	<0.1	N/A	N/A	N/A
P3-MW-18 (Interlab)	MW-11	2007	3	Phase I	0.0030	<0.0002	0.0020	<0.001	0.0040	0.0010	0.0030	0.0120	N/A	<0.1	<0.25	<0.25
P3-MW-11	MW-11	2008	4	Phase I	<0.0050	<0.00025	<0.0025	<0.0025	0.0056	<0.0050	<0.0250	0.0295	<0.1	N/A	N/A	N/A
P309-11W	MW-11	2009	5	Phase I	0.0030	0.00078	0.0420	0.0067	**0.4800**	**2.30**	0.0280	**0.6100**	<0.1	<0.1	<0.1	N/A
WS11-011	MW-11	2011	7	Phase II	<0.0010	<0.00050	0.0600	<0.0010	0.0080	0.0320	0.0100	0.0600	<0.5	N/A	N/A	N/A
P314-11W	MW-11	2014	10	Phase II	0.0118	0.00014	**0.4080**	0.0108	0.2410	**0.9960**	**0.0655**	0.2890	<0.2	0.20	0.20	0.70
MW-11	MW-11	2019	15	Phase II	0.00037	<0.000020	0.0085	<0.00030	0.0078	0.0085	0.0023	0.0140	0.032	<0.020	<0.043	<0.055

TABLE 6A

PIN-3 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Downgradient																
04-15419	MW-11	2004			0.0150	<0.0010	0.0870	0.0190	0.2230	0.2300	0.0520	0.1750	<0.05	<0.5	<1.0	<1.0
04-15420	MW-12	2004			0.0150	<0.0010	0.1340	0.0230	0.3930	0.8250	0.0770	0.8780	<0.05	<0.5	<1.0	<1.0
				N value	2	2	2	2	2	2	2	2	2	2	2	2
Baseline Data - Arithmetic Mean					0.0150	0.0005	0.1105	0.0210	0.3080	0.5275	0.0645	0.5265	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0150**	**0.0010**	**0.1105**	**0.0210**	**0.3080**	**0.5275**	**0.0645**	**0.5265**	**0.05**	**0.5**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0000	0.0000	0.0332	0.0028	0.1202	0.4207	0.0177	0.4971	0.00	0.0	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0150**	**0.0010**	**0.2102**	**0.0295**	**0.6686**	**1.79**	**0.1175**	**2.02**	**0.05**	**0.5**	**1.0**	**1.0**
Downgradient - MW-12																
Not sampled - insufficient volume	MW-12	2005	1	Phase I												
MW-9	MW-12	2006	2	Phase I	<0.0050	0.000087	<0.0050	<0.0015	<0.0050	<0.0025	0.0067	<0.0250	<0.1	<0.25	<0.25	N/A
P3-MW-12	MW-12	2007	3	Phase I	<0.0050	<0.00017	0.0100	<0.0030	<0.010	<0.0050	0.0140	<0.0500	<0.1	N/A	N/A	N/A
P3-MW-12	MW-12	2008	4	Phase I	<0.0050	<0.00025	<0.0025	<0.0025	<0.0050	<0.0050	<0.025	<0.0050	<0.1	N/A	N/A	N/A
P309-12W	MW-12	2009	5	Phase I	0.0090	0.0004	**0.1500**	0.0070	0.0950	0.1000	0.0570	0.5000	<0.1	<0.1	<0.1	N/A
WS11-012	MW-12	2011	7	Phase II	<0.0010	<0.00050	<0.0200	0.0010	<0.0020	<0.0010	0.0210	0.0800	<0.5	N/A	N/A	N/A
WS11-013 (Dup)	MW-12	2011	7	Phase II	<0.0010	<0.00050	<0.0200	0.0010	<0.0020	<0.0010	0.0210	0.0800	<0.5	N/A	N/A	N/A
WS11-012 (Interlab)	MW-12	2011	7	Phase II	0.0003	0.000013	0.0010	0.0005	0.0018	0.0003	0.0049	<0.0030	<0.1	<0.1	<0.1	<0.1
P314-12W	MW-12	2014	10	Phase II	0.0135	0.00002	**0.2030**	0.0158	0.1380	0.1250	**0.1150**	0.2710	<0.2	<0.2	<0.1	<0.1
MW-12	MW-12	2019	15	Phase II	0.00031	<0.000020	0.0047	<0.00030	0.0037	0.0040	0.0046	0.0130	0.038	<0.020	<0.043	<0.055
MW-17 (Dup)	MW-17	2019	15	Phase II	0.00035	<0.000020	0.0045	0.00031	0.0035	0.0040	0.0045	0.0130	0.032	<0.020	<0.043	<0.055

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

N/A = not analyzed

2006 hydrocarbons analyzed as VPH/EPH.

2007 hydrocarbons analyzed as Total Extractable Hydrocarbons.

2008 hydrocarbons analyzed at TPH plus F1 fraction HCs.

Most 2011 hydrocarbons reported by the laboratory as Total Petroleum Hydrocarbons (TPH) (C6-C50).

APPENDIX A

Statement of Limitations

This report has been prepared exclusively for the Department of National Defence (DND) Canada. Any other person or entity may not rely upon the report without express written consent from Department of National Defence (DND) Canada.

Any use, which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Arcadis Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Some of the information presented in this report was provided through existing documents. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, Arcadis Canada Inc., in certain instances, has been required to assume that the information provided is accurate.

The conclusions presented represent the best judgment of the assessors based on current environmental standards and on the site conditions observed on August 15, 16, 17, 18 and 19, 2019. Due to the nature of the investigation and the limited data available, the assessors cannot warrant against undiscovered environmental liabilities.

Should additional information become available, Arcadis Canada Inc. requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

There is no warranty, expressed or implied that the work reported herein has uncovered all potential environmental liabilities, nor does the report preclude the possibility of contamination outside of the areas of investigation. The findings of this report were developed in a manner consistent with a level of care and skill normally exercised by members of the environmental science and engineering profession currently practicing under similar conditions in the area.

A potential remains for the presence of unknown, unidentified, or unforeseen surface and sub-surface contamination. Any evidence of such potential site contamination would require appropriate surface and sub-surface exploration and testing.

If new information is developed in future work (which may include excavations, borings, or other studies), Arcadis Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

APPENDIX B

Laboratory QA/QC Reports and Certificates of Analysis

APPENDIX B1

Laboratory QA/QC Reports and Certificates of Analysis – Soil

Your Project #: 30000251
Site#: PIN-3

Attention: Elliott Holden

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Your C.O.C. #: 591564-02-01, 591564-07-01, 591564-08-01, 591564-09-01, 591564-10-01, 591564-11-01, 591564-12-01

Report Date: 2019/11/25
Report #: R2815581
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B970574
Received: 2019/08/22, 10:05

Sample Matrix: Soil
Samples Received: 62

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract) (2)	16	N/A	2019/08/26	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (2)	46	N/A	2019/08/27	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	14	N/A	2019/08/27		Auto Calc
F1-BTEX	47	N/A	2019/08/28		Auto Calc
CCME Hydrocarbons (F2-F4)+F3A/B in soil (3)	4	2019/08/26	2019/08/28	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4)+F3A/B in soil (3)	1	2019/08/27	2019/08/29	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (4)	28	2019/08/26	2019/08/27	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (4)	14	2019/08/26	2019/08/28	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (4)	14	2019/08/27	2019/08/28	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (4)	6	2019/08/27	2019/08/29	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2/F2+F3B) in soil (5)	5	N/A	2019/11/22		Auto Calc
Elements by ICPMS - Soils	60	2019/08/27	2019/08/27	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils	1	2019/08/27	2019/08/28	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils	1	2019/08/29	2019/08/29	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Moisture	42	N/A	2019/08/27	AB SOP-00002	CCME PHC-CWS m
Moisture	20	N/A	2019/08/28	AB SOP-00002	CCME PHC-CWS m
Polychlorinated Biphenyls in Soil (1)	20	2019/08/29	2019/08/29	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	37	2019/08/29	2019/08/30	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	5	2019/08/30	2019/08/30	CAL SOP-00149	EPA 8082A R1 m

Your Project #: 30000251
Site#: PIN-3

Attention: Elliott Holden

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Your C.O.C. #: 591564-02-01, 591564-07-01, 591564-08-01, 591564-09-01, 591564-10-01, 591564-11-01, 591564-12-01

Report Date: 2019/11/25
Report #: R2815581
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B970574
Received: 2019/08/22, 10:05

Sample Matrix: Soil
Samples Received: 62

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total PCBs in Soil (1)	40	N/A	2019/08/30		Auto Calc
Total PCBs in Soil (1)	22	N/A	2019/09/03		Auto Calc

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by BV Labs Calgary Environmental
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(3) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(4) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements

Your Project #: 30000251
Site#: PIN-3

Attention: Elliott Holden

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Your C.O.C. #: 591564-02-01, 591564-07-01, 591564-08-01, 591564-09-01, 591564-10-01, 591564-11-01, 591564-12-01

Report Date: 2019/11/25
Report #: R2815581
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B970574

Received: 2019/08/22, 10:05

of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parminder Virk, Key Account Specialist
Email: Parminder.Virk@bvlabs.com
Phone# (403)735-2235

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0060	WJ0060	WJ0061	WJ0061		WJ0062		
Sampling Date		2019/08/16 09:40	2019/08/16 09:40	2019/08/16 09:40	2019/08/16 09:40		2019/08/16 10:10		
COC Number		591564-02-01	591564-02-01	591564-02-01	591564-02-01		591564-02-01		
	UNITS	MW-9A	MW-9A Lab-Dup	MW-9B	MW-9B Lab-Dup	QC Batch	MW-10A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	3.5	6.2	3.2	N/A	9564487	<3.0	3.0	9563568
F3 (C16-C34 Hydrocarbons)	mg/kg	24	29	48	N/A	9564487	19	6.4	9563568
F4 (C34-C50 Hydrocarbons)	mg/kg	6.9	13	13	N/A	9564487	<4.7	4.7	9563568
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	N/A	9564487	Yes	N/A	9563568
Physical Properties									
Moisture	%	5.9	6.0	16	N/A	9564271	5.1	0.30	9563308
Volatiles									
Xylenes (Total)	mg/kg	N/A	N/A	<0.045	N/A	9562593	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	N/A	N/A	<3.5	N/A	9562593	<3.5	3.5	9562593
Field Preserved Volatiles									
Benzene	mg/kg	N/A	N/A	<0.0050	<0.0050	9563205	<0.0050	0.0050	9563205
Toluene	mg/kg	N/A	N/A	<0.050	<0.050	9563205	<0.050	0.050	9563205
Ethylbenzene	mg/kg	N/A	N/A	<0.010	<0.010	9563205	<0.010	0.010	9563205
m & p-Xylene	mg/kg	N/A	N/A	<0.040	<0.040	9563205	<0.040	0.040	9563205
o-Xylene	mg/kg	N/A	N/A	<0.020	<0.020	9563205	<0.020	0.020	9563205
F1 (C6-C10)	mg/kg	<3.5	N/A	<3.5	<3.5	9563205	<3.5	3.5	9563205
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	96	N/A	93	97	9563205	96	N/A	9563205
4-Bromofluorobenzene (sur.)	%	103	N/A	102	102	9563205	104	N/A	9563205
D10-o-Xylene (sur.)	%	123	N/A	125	133	9563205	137	N/A	9563205
D4-1,2-Dichloroethane (sur.)	%	121	N/A	121	120	9563205	120	N/A	9563205
O-TERPHENYL (sur.)	%	81	80	85	N/A	9564487	92	N/A	9563568

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0063	WJ0063		WJ0064	WJ0065		
Sampling Date		2019/08/16 10:10	2019/08/16 10:10		2019/08/16 10:30	2019/08/16 10:30		
COC Number		591564-02-01	591564-02-01		591564-02-01	591564-02-01		
	UNITS	MW-10B	MW-10B Lab-Dup	QC Batch	MW-11A	MW-11B	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	<3.0	9563568	4.8	<3.0	3.0	9564487
F3 (C16-C34 Hydrocarbons)	mg/kg	14	26	9563568	68	9.7	6.4	9564487
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	<4.7	9563568	17	<4.7	4.7	9564487
Reached Baseline at C50	mg/kg	Yes	Yes	9563568	Yes	Yes	N/A	9564487
Physical Properties								
Moisture	%	6.0	6.2	9563308	15	2.9	0.30	9564271
Volatiles								
Xylenes (Total)	mg/kg	<0.045	N/A	9562593	<0.045	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	N/A	9562593	<3.5	<3.5	3.5	9562593
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	N/A	9563205	<0.0050	<0.0050	0.0050	9563205
Toluene	mg/kg	<0.050	N/A	9563205	<0.050	<0.050	0.050	9563205
Ethylbenzene	mg/kg	<0.010	N/A	9563205	<0.010	<0.010	0.010	9563205
m & p-Xylene	mg/kg	<0.040	N/A	9563205	<0.040	<0.040	0.040	9563205
o-Xylene	mg/kg	<0.020	N/A	9563205	<0.020	<0.020	0.020	9563205
F1 (C6-C10)	mg/kg	<3.5	N/A	9563205	<3.5	<3.5	3.5	9563205
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	93	N/A	9563205	93	95	N/A	9563205
4-Bromofluorobenzene (sur.)	%	103	N/A	9563205	101	103	N/A	9563205
D10-o-Xylene (sur.)	%	121	N/A	9563205	124	122	N/A	9563205
D4-1,2-Dichloroethane (sur.)	%	121	N/A	9563205	122	121	N/A	9563205
O-TERPHENYL (sur.)	%	87	90	9563568	88	81	N/A	9564487

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0066		WJ0067		WJ0068	WJ0069		
Sampling Date		2019/08/16 11:00		2019/08/16 11:00		2019/08/16 11:30	2019/08/17 09:20		
COC Number		591564-02-01		591564-02-01		591564-02-01	591564-02-01		
	UNITS	MW-12A	QC Batch	MW-12B	QC Batch	MW-17B	MW-5A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	9563568	<3.0	9563141	3.0	<3.0	3.0	9564487
F3 (C16-C34 Hydrocarbons)	mg/kg	8.4	9563568	12	9563141	19	12	6.4	9564487
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	9563568	<4.7	9563141	<4.7	<4.7	4.7	9564487
Reached Baseline at C50	mg/kg	Yes	9563568	Yes	9563141	Yes	Yes	N/A	9564487
Physical Properties									
Moisture	%	4.5	9563308	5.7	9563016	6.0	2.7	0.30	9564271
Volatiles									
Xylenes (Total)	mg/kg	<0.045	9562593	<0.045	9562593	<0.045	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	9562593	<3.5	9562593	<3.5	<3.5	3.5	9562593
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	9563205	<0.0050	9563205	<0.0050	<0.0050	0.0050	9563205
Toluene	mg/kg	<0.050	9563205	<0.050	9563205	<0.050	<0.050	0.050	9563205
Ethylbenzene	mg/kg	<0.010	9563205	<0.010	9563205	<0.010	<0.010	0.010	9563205
m & p-Xylene	mg/kg	<0.040	9563205	<0.040	9563205	<0.040	<0.040	0.040	9563205
o-Xylene	mg/kg	<0.020	9563205	<0.020	9563205	<0.020	<0.020	0.020	9563205
F1 (C6-C10)	mg/kg	<3.5	9563205	<3.5	9563205	<3.5	<3.5	3.5	9563205
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	9563205	105	9563205	101	96	N/A	9563205
4-Bromofluorobenzene (sur.)	%	102	9563205	99	9563205	101	104	N/A	9563205
D10-o-Xylene (sur.)	%	118	9563205	126	9563205	126	121	N/A	9563205
D4-1,2-Dichloroethane (sur.)	%	122	9563205	118	9563205	119	123	N/A	9563205
O-TERPHENYL (sur.)	%	95	9563568	85	9563141	78	82	N/A	9564487

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0084		WJ0085		WJ0086		WJ0087		
Sampling Date		2019/08/17 09:20		2019/08/17 09:40		2019/08/17 09:40		2019/08/17 10:00		
COC Number		591564-07-01		591564-07-01		591564-07-01		591564-07-01		
	UNITS	MW-5B	QC Batch	MW-6A	QC Batch	MW-6B	QC Batch	MW-7A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	9564487	<3.0	9563568	<3.0	9563568	<3.0	3.0	9563141
F3 (C16-C34 Hydrocarbons)	mg/kg	13	9564487	17	9563568	9.1	9563568	12	6.4	9563141
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	9564487	<4.7	9563568	<4.7	9563568	<4.7	4.7	9563141
Reached Baseline at C50	mg/kg	Yes	9564487	Yes	9563568	Yes	9563568	Yes	N/A	9563141
Physical Properties										
Moisture	%	3.1	9564271	7.9	9563308	4.3	9563308	3.5	0.30	9563016
Volatiles										
Xylenes (Total)	mg/kg	<0.045	9562593	<0.045	9562593	<0.045	9562593	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	9562593	<3.5	9562593	<3.5	9562593	<3.5	3.5	9562593
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	9563205	<0.0050	9563205	<0.0050	9563250	<0.0050	0.0050	9563250
Toluene	mg/kg	<0.050	9563205	<0.050	9563205	<0.050	9563250	<0.050	0.050	9563250
Ethylbenzene	mg/kg	<0.010	9563205	<0.010	9563205	<0.010	9563250	<0.010	0.010	9563250
m & p-Xylene	mg/kg	<0.040	9563205	<0.040	9563205	<0.040	9563250	<0.040	0.040	9563250
o-Xylene	mg/kg	<0.020	9563205	<0.020	9563205	<0.020	9563250	<0.020	0.020	9563250
F1 (C6-C10)	mg/kg	<3.5	9563205	<3.5	9563205	<3.5	9563250	<3.5	3.5	9563250
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	98	9563205	98	9563205	102	9563250	95	N/A	9563250
4-Bromofluorobenzene (sur.)	%	103	9563205	104	9563205	101	9563250	105	N/A	9563250
D10-o-Xylene (sur.)	%	133	9563205	120	9563205	126	9563250	117	N/A	9563250
D4-1,2-Dichloroethane (sur.)	%	122	9563205	125	9563205	108	9563250	109	N/A	9563250
O-TERPHENYL (sur.)	%	77	9564487	93	9563568	94	9563568	86	N/A	9563141

RDL = Reportable Detection Limit
N/A = Not Applicable

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0087			WJ0088			WJ0089		
Sampling Date		2019/08/17 10:00			2019/08/17 10:00			2019/08/17 10:20		
COC Number		591564-07-01			591564-07-01			591564-07-01		
	UNITS	MW-7A Lab-Dup	RDL	QC Batch	MW-7B	RDL	QC Batch	MW-8A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	N/A	3.0	9563141	<2.0	2.0	9563345	4.2	3.0	9564487
F3 (C16-C34 Hydrocarbons)	mg/kg	N/A	6.4	9563141	9.6	5.5	9563345	11	6.4	9564487
F4 (C34-C50 Hydrocarbons)	mg/kg	N/A	4.7	9563141	<3.9	3.9	9563345	<4.7	4.7	9564487
Reached Baseline at C50	mg/kg	N/A	N/A	9563141	Yes	N/A	9563345	Yes	N/A	9564487
Physical Properties										
Moisture	%	N/A	0.30	9563016	3.1	0.30	9563159	14	0.30	9564271
Volatiles										
Xylenes (Total)	mg/kg	N/A	0.045	9562593	<0.045	0.045	9562593	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	N/A	3.5	9562593	<3.5	3.5	9562593	<3.5	3.5	9562593
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	0.0050	9563250	<0.0050	0.0050	9563250	<0.0050	0.0050	9563250
Toluene	mg/kg	<0.050	0.050	9563250	<0.050	0.050	9563250	<0.050	0.050	9563250
Ethylbenzene	mg/kg	<0.010	0.010	9563250	<0.010	0.010	9563250	<0.010	0.010	9563250
m & p-Xylene	mg/kg	<0.040	0.040	9563250	<0.040	0.040	9563250	<0.040	0.040	9563250
o-Xylene	mg/kg	<0.020	0.020	9563250	<0.020	0.020	9563250	<0.020	0.020	9563250
F1 (C6-C10)	mg/kg	<3.5	3.5	9563250	<3.5	3.5	9563250	<3.5	3.5	9563250
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	93	N/A	9563250	94	N/A	9563250	96	N/A	9563250
4-Bromofluorobenzene (sur.)	%	103	N/A	9563250	103	N/A	9563250	105	N/A	9563250
D10-o-Xylene (sur.)	%	115	N/A	9563250	118	N/A	9563250	123	N/A	9563250
D4-1,2-Dichloroethane (sur.)	%	109	N/A	9563250	109	N/A	9563250	112	N/A	9563250
O-TERPHENYL (sur.)	%	N/A	N/A	9563141	90	N/A	9563345	83	N/A	9564487

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0090	WJ0091		WJ0092	WJ0093		
Sampling Date		2019/08/17 10:20	2019/08/17 18:40		2019/08/17 18:40	2019/08/17 17:40		
COC Number		591564-07-01	591564-07-01		591564-07-01	591564-07-01		
	UNITS	MW-8B	P3-1A	QC Batch	P3-1B	P3-2A	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	3.1	4.7	9564487	<3.0	<3.0	3.0	9563568
F3 (C16-C34 Hydrocarbons)	mg/kg	11	60	9564487	46	13	6.4	9563568
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	14	9564487	<4.7	<4.7	4.7	9563568
Reached Baseline at C50	mg/kg	Yes	Yes	9564487	Yes	Yes	N/A	9563568
Physical Properties								
Moisture	%	11	15	9564271	9.9	3.3	0.30	9563308
Volatiles								
Xylenes (Total)	mg/kg	<0.045	<0.045	9562593	<0.045	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	<3.5	9562593	<3.5	<3.5	3.5	9562593
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	9563250	<0.0050	<0.0050	0.0050	9563250
Toluene	mg/kg	<0.050	<0.050	9563250	<0.050	<0.050	0.050	9563250
Ethylbenzene	mg/kg	<0.010	<0.010	9563250	<0.010	<0.010	0.010	9563250
m & p-Xylene	mg/kg	<0.040	<0.040	9563250	<0.040	<0.040	0.040	9563250
o-Xylene	mg/kg	<0.020	<0.020	9563250	<0.020	<0.020	0.020	9563250
F1 (C6-C10)	mg/kg	<3.5	<3.5	9563250	<3.5	<3.5	3.5	9563250
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	93	94	9563250	94	94	N/A	9563250
4-Bromofluorobenzene (sur.)	%	102	103	9563250	103	104	N/A	9563250
D10-o-Xylene (sur.)	%	114	119	9563250	121	118	N/A	9563250
D4-1,2-Dichloroethane (sur.)	%	110	111	9563250	110	112	N/A	9563250
O-TERPHENYL (sur.)	%	81	95	9564487	104	92	N/A	9563568

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0094			WJ0095	WJ0096	WJ0097	WJ0097		
Sampling Date		2019/08/17 17:40			2019/08/17 18:00	2019/08/17 18:00	2019/08/17 18:20	2019/08/17 18:20		
COC Number		591564-08-01			591564-08-01	591564-08-01	591564-08-01	591564-08-01		
	UNITS	P3-2B	RDL	QC Batch	P3-3A	P3-3B	P3-4A	P3-4A Lab-Dup	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	4.5	3.0	9564487	3.2	<2.0	<2.0	2.5	2.0	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	20	6.4	9564487	26	13	21	30	5.5	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	4.7	9564487	4.3	<3.9	<3.9	5.4	3.9	9563345
Reached Baseline at C50	mg/kg	Yes	N/A	9564487	Yes	Yes	Yes	Yes	N/A	9563345
Physical Properties										
Moisture	%	3.1	0.30	9564271	7.2	4.4	6.9	7.0	0.30	9563159
Volatiles										
Xylenes (Total)	mg/kg	<0.045	0.045	9562593	<0.045	<0.045	<0.045	N/A	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	3.5	9562593	<3.5	<3.5	<3.5	N/A	3.5	9562593
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	0.0050	9563205	<0.0050	<0.0050	<0.0050	N/A	0.0050	9563205
Toluene	mg/kg	<0.050	0.050	9563205	<0.050	<0.050	<0.050	N/A	0.050	9563205
Ethylbenzene	mg/kg	<0.010	0.010	9563205	<0.010	<0.010	<0.010	N/A	0.010	9563205
m & p-Xylene	mg/kg	<0.040	0.040	9563205	<0.040	<0.040	<0.040	N/A	0.040	9563205
o-Xylene	mg/kg	<0.020	0.020	9563205	<0.020	<0.020	<0.020	N/A	0.020	9563205
F1 (C6-C10)	mg/kg	<3.5	3.5	9563205	<3.5	<3.5	<3.5	N/A	3.5	9563205
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95	N/A	9563205	95	96	97	N/A	N/A	9563205
4-Bromofluorobenzene (sur.)	%	103	N/A	9563205	104	103	103	N/A	N/A	9563205
D10-o-Xylene (sur.)	%	121	N/A	9563205	123	120	138	N/A	N/A	9563205
D4-1,2-Dichloroethane (sur.)	%	124	N/A	9563205	124	123	126	N/A	N/A	9563205
O-TERPHENYL (sur.)	%	98	N/A	9564487	85	91	87	86	N/A	9563345

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0098	WJ0099	WJ0100	WJ0101	WJ0102	WJ0103		
Sampling Date		2019/08/17 18:20	2019/08/18 10:10	2019/08/18 10:10	2019/08/18 11:10	2019/08/18 11:10	2019/08/18 12:20		
COC Number		591564-08-01	591564-08-01	591564-08-01	591564-08-01	591564-08-01	591564-08-01		
	UNITS	**P3-4B**	**MW-13A**	**MW-13B**	**MW-14A**	**MW-14B**	**MW-15A**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	9563568
F3 (C16-C34 Hydrocarbons)	mg/kg	17	27	25	20	11	20	6.4	9563568
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	4.7	9563568
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9563568
Physical Properties									
Moisture	%	7.0	11	8.3	15	11	15	0.30	9563308
Volatiles									
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	3.5	9562593
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9563250
Toluene	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	9563250
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9563250
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9563250
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9563250
F1 (C6-C10)	mg/kg	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	3.5	9563250
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	93	93	94	92	94	94	N/A	9563250
4-Bromofluorobenzene (sur.)	%	104	102	104	102	104	103	N/A	9563250
D10-o-Xylene (sur.)	%	120	117	121	124	119	135	N/A	9563250
D4-1,2-Dichloroethane (sur.)	%	112	111	112	112	113	115	N/A	9563250
O-TERPHENYL (sur.)	%	95	108	95	91	92	95	N/A	9563568

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0104		WJ0105		WJ0106		WJ0107		
Sampling Date		2019/08/18 12:20		2019/08/18 09:10		2019/08/18 09:10		2019/08/18 10:30		
COC Number		591564-09-01		591564-09-01		591564-09-01		591564-09-01		
	UNITS	MW-15B	QC Batch	MW-16A	QC Batch	MW-16B	QC Batch	MW-18B	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	9564487	<3.0	9563568	<3.0	9563568	3.1	3.0	9564487
F3 (C16-C34 Hydrocarbons)	mg/kg	14	9564487	84	9563568	19	9563568	28	6.4	9564487
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	9564487	<4.7	9563568	<4.7	9563568	6.9	4.7	9564487
Reached Baseline at C50	mg/kg	Yes	9564487	Yes	9563568	Yes	9563568	Yes	N/A	9564487
Physical Properties										
Moisture	%	8.0	9564271	36	9563308	19	9563308	9.4	0.30	9564271
Volatiles										
Xylenes (Total)	mg/kg	<0.045	9562593	<0.045	9562593	<0.045	9562593	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	9562593	<3.5	9562593	<3.5	9562593	<3.5	3.5	9562593
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	9563250	<0.0050	9563205	<0.0050	9563250	<0.0050	0.0050	9563250
Toluene	mg/kg	<0.050	9563250	<0.050	9563205	<0.050	9563250	<0.050	0.050	9563250
Ethylbenzene	mg/kg	<0.010	9563250	<0.010	9563205	<0.010	9563250	<0.010	0.010	9563250
m & p-Xylene	mg/kg	<0.040	9563250	<0.040	9563205	<0.040	9563250	<0.040	0.040	9563250
o-Xylene	mg/kg	<0.020	9563250	<0.020	9563205	<0.020	9563250	<0.020	0.020	9563250
F1 (C6-C10)	mg/kg	<3.5	9563250	<3.5	9563205	<3.5	9563250	<3.5	3.5	9563250
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	92	9563250	97	9563205	93	9563250	93	N/A	9563250
4-Bromofluorobenzene (sur.)	%	103	9563250	102	9563205	104	9563250	103	N/A	9563250
D10-o-Xylene (sur.)	%	122	9563250	121	9563205	126	9563250	122	N/A	9563250
D4-1,2-Dichloroethane (sur.)	%	114	9563250	126	9563205	114	9563250	113	N/A	9563250
O-TERPHENYL (sur.)	%	86	9564487	95	9563568	94	9563568	92	N/A	9564487

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0108			WJ0109		WJ0110		
Sampling Date		2019/08/18 11:30			2019/08/18 18:10		2019/08/18 18:10		
COC Number		591564-09-01			591564-09-01		591564-09-01		
	UNITS	MW-19B	RDL	QC Batch	P3-5A	RDL	P3-5B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<2.0	2.0	9563345	<3.0	3.0	<5.9 (1)	5.9	9563568
F3 (C16-C34 Hydrocarbons)	mg/kg	17	5.5	9563345	32	6.4	140 (1)	13	9563568
F4 (C34-C50 Hydrocarbons)	mg/kg	<3.9	3.9	9563345	<4.7	4.7	<9.4 (1)	9.4	9563568
Reached Baseline at C50	mg/kg	Yes	N/A	9563345	Yes	N/A	Yes	N/A	9563568
Physical Properties									
Moisture	%	13	0.30	9563159	20	0.30	50	0.30	9563308
Volatiles									
Xylenes (Total)	mg/kg	<0.045	0.045	9562593	<0.045	0.045	<0.12	0.12	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	3.5	9562593	<3.5	3.5	<7.0	7.0	9562593
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	0.0050	9563250	<0.0050	0.0050	<0.013 (1)	0.013	9563250
Toluene	mg/kg	<0.050	0.050	9563250	<0.050	0.050	<0.13 (1)	0.13	9563250
Ethylbenzene	mg/kg	<0.010	0.010	9563250	<0.010	0.010	<0.026 (1)	0.026	9563250
m & p-Xylene	mg/kg	<0.040	0.040	9563250	<0.040	0.040	<0.10 (1)	0.10	9563250
o-Xylene	mg/kg	<0.020	0.020	9563250	<0.020	0.020	<0.052 (1)	0.052	9563250
F1 (C6-C10)	mg/kg	<3.5	3.5	9563250	<3.5	3.5	<7.0 (1)	7.0	9563250
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	95	N/A	9563250	95	N/A	94	N/A	9563250
4-Bromofluorobenzene (sur.)	%	104	N/A	9563250	104	N/A	103	N/A	9563250
D10-o-Xylene (sur.)	%	122	N/A	9563250	124	N/A	109	N/A	9563250
D4-1,2-Dichloroethane (sur.)	%	115	N/A	9563250	116	N/A	115	N/A	9563250
O-TERPHENYL (sur.)	%	77	N/A	9563345	95	N/A	97	N/A	9563568

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.

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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0111	WJ0111		WJ0112			WJ0113		
Sampling Date		2019/08/18 17:00	2019/08/18 17:00		2019/08/18 17:00			2019/08/18 17:20		
COC Number		591564-09-01	591564-09-01		591564-09-01			591564-09-01		
	UNITS	P3-6A	P3-6A Lab-Dup	QC Batch	P3-6B	RDL	QC Batch	P3-7A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	N/A	9563568	<3.0	3.0	9564487	<2.0	2.0	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	<6.4	N/A	9563568	13	6.4	9564487	12	5.5	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	N/A	9563568	<4.7	4.7	9564487	<3.9	3.9	9563345
Reached Baseline at C50	mg/kg	Yes	N/A	9563568	Yes	N/A	9564487	Yes	N/A	9563345
Physical Properties										
Moisture	%	13	N/A	9563308	19	0.30	9564271	8.3	0.30	9563159
Volatiles										
Xylenes (Total)	mg/kg	<0.045	N/A	9562593	<0.045	0.045	9562593	<0.045	0.045	9562593
F1 (C6-C10) - BTEX	mg/kg	<3.5	N/A	9562593	<3.5	3.5	9562593	<3.5	3.5	9562593
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	<0.0050	9563367	<0.0050	0.0050	9563367	<0.0050	0.0050	9563254
Toluene	mg/kg	<0.050	<0.050	9563367	<0.050	0.050	9563367	<0.050	0.050	9563254
Ethylbenzene	mg/kg	<0.010	<0.010	9563367	<0.010	0.010	9563367	<0.010	0.010	9563254
m & p-Xylene	mg/kg	<0.040	<0.040	9563367	<0.040	0.040	9563367	<0.040	0.040	9563254
o-Xylene	mg/kg	<0.020	<0.020	9563367	<0.020	0.020	9563367	<0.020	0.020	9563254
F1 (C6-C10)	mg/kg	<3.5	<3.5	9563367	<3.5	3.5	9563367	<3.5	3.5	9563254
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95	96	9563367	95	N/A	9563367	92	N/A	9563254
4-Bromofluorobenzene (sur.)	%	102	105	9563367	103	N/A	9563367	104	N/A	9563254
D10-o-Xylene (sur.)	%	107	109	9563367	112	N/A	9563367	121	N/A	9563254
D4-1,2-Dichloroethane (sur.)	%	107	109	9563367	105	N/A	9563367	108	N/A	9563254
O-TERPHENYL (sur.)	%	92	N/A	9563568	85	N/A	9564487	86	N/A	9563345

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0114	WJ0114	WJ0115			WJ0116	WJ0117		
Sampling Date		2019/08/18 17:20	2019/08/18 17:20	2019/08/18 17:50			2019/08/18 17:50	2019/08/18 15:20		
COC Number		591564-10-01	591564-10-01	591564-10-01			591564-10-01	591564-10-01		
	UNITS	P3-7B	P3-7B Lab-Dup	P3-8A	RDL	QC Batch	P3-8B	P3-9A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	2.2	N/A	2.2	2.0	9563345	4.1	39	3.0	9564487
F3 (C16-C34 Hydrocarbons)	mg/kg	14	N/A	42	5.5	9563345	19	43	6.4	9564487
F4 (C34-C50 Hydrocarbons)	mg/kg	<3.9	N/A	41	3.9	9563345	12	<4.7	4.7	9564487
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	9563345	Yes	Yes	N/A	9564487
Physical Properties										
Moisture	%	10	N/A	8.2	0.30	9563159	14	4.6	0.30	9564271
Volatiles										
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	0.045	9562594	<0.045	<0.045	0.045	9562594
F1 (C6-C10) - BTEX	mg/kg	<3.5	N/A	<3.5	3.5	9562594	<3.5	<3.5	3.5	9562594
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	0.0050	9563254	<0.0050	<0.0050	0.0050	9563254
Toluene	mg/kg	<0.050	<0.050	<0.050	0.050	9563254	<0.050	<0.050	0.050	9563254
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	0.010	9563254	<0.010	<0.010	0.010	9563254
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	0.040	9563254	<0.040	<0.040	0.040	9563254
o-Xylene	mg/kg	<0.020	<0.020	<0.020	0.020	9563254	<0.020	<0.020	0.020	9563254
F1 (C6-C10)	mg/kg	<3.5	<3.5	<3.5	3.5	9563254	<3.5	<3.5	3.5	9563254
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	92	92	93	N/A	9563254	92	93	N/A	9563254
4-Bromofluorobenzene (sur.)	%	103	105	105	N/A	9563254	105	104	N/A	9563254
D10-o-Xylene (sur.)	%	120	123	116	N/A	9563254	122	124	N/A	9563254
D4-1,2-Dichloroethane (sur.)	%	107	108	110	N/A	9563254	109	111	N/A	9563254
O-TERPHENYL (sur.)	%	81	N/A	79	N/A	9563345	85	85	N/A	9564487

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0118			WJ0119	WJ0120		WJ0121		
Sampling Date		2019/08/18 15:20			2019/08/18 15:40	2019/08/18 15:40		2019/08/18 16:20		
COC Number		591564-10-01			591564-10-01	591564-10-01		591564-10-01		
	UNITS	**P3-9B**	**RDL**	**QC Batch**	**P3-10A**	**P3-10B**	**RDL**	**P3-11A**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	14	3.0	9564487	<2.0	2.3	2.0	6.6 (1)	4.2	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	20	6.4	9564487	10	17	5.5	200 (1)	12	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	4.7	9564487	<3.9	<3.9	3.9	26 (1)	8.4	9563345
Reached Baseline at C50	mg/kg	Yes	N/A	9564487	Yes	Yes	N/A	Yes	N/A	9563345
Physical Properties										
Moisture	%	9.7	0.30	9564271	10	17	0.30	53	0.30	9563159
Volatiles										
Xylenes (Total)	mg/kg	<0.045	0.045	9562594	<0.045	<0.045	0.045	<0.10	0.10	9562594
F1 (C6-C10) - BTEX	mg/kg	4.9	3.5	9562594	<3.5	<3.5	3.5	<6.6	6.6	9562594
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	0.0050	9563254	<0.0050	<0.0050	0.0050	<0.012 (1)	0.012	9563254
Toluene	mg/kg	<0.050	0.050	9563254	<0.050	<0.050	0.050	<0.12 (1)	0.12	9563254
Ethylbenzene	mg/kg	<0.010	0.010	9563254	<0.010	<0.010	0.010	<0.023 (1)	0.023	9563254
m & p-Xylene	mg/kg	<0.040	0.040	9563254	<0.040	<0.040	0.040	<0.092 (1)	0.092	9563254
o-Xylene	mg/kg	<0.020	0.020	9563254	<0.020	<0.020	0.020	<0.046 (1)	0.046	9563254
F1 (C6-C10)	mg/kg	<3.5	3.5	9563254	<3.5	<3.5	3.5	<6.6 (1)	6.6	9563254
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	92	N/A	9563254	93	92	N/A	96	N/A	9563254
4-Bromofluorobenzene (sur.)	%	105	N/A	9563254	104	104	N/A	103	N/A	9563254
D10-o-Xylene (sur.)	%	130	N/A	9563254	125	126	N/A	133	N/A	9563254
D4-1,2-Dichloroethane (sur.)	%	110	N/A	9563254	112	110	N/A	108	N/A	9563254
O-TERPHENYL (sur.)	%	84	N/A	9564487	85	89	N/A	86	N/A	9563345

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0122		WJ0123			WJ0124	WJ0125		
Sampling Date		2019/08/18 16:20		2019/08/18 16:40			2019/08/18 20:20	2019/08/18 20:20		
COC Number		591564-10-01		591564-10-01			591564-11-01	591564-11-01		
	UNITS	P3-11B	QC Batch	P3-19B	RDL	QC Batch	P3-12A	P3-12B	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	3.8	9564487	<3.0	3.0	9563568	<2.0	3.1	2.0	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	12	9564487	<6.4	6.4	9563568	17	32	5.5	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	9564487	<4.7	4.7	9563568	<3.9	5.8	3.9	9563345
Reached Baseline at C50	mg/kg	Yes	9564487	Yes	N/A	9563568	Yes	Yes	N/A	9563345
Physical Properties										
Moisture	%	9.3	9564271	10	0.30	9563308	15	14	0.30	9563159
Volatiles										
Xylenes (Total)	mg/kg	<0.045	9562594	<0.045	0.045	9562594	<0.045	<0.045	0.045	9562594
F1 (C6-C10) - BTEX	mg/kg	<3.5	9562594	<3.5	3.5	9562594	5.3	<3.5	3.5	9562594
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	9563254	<0.0050	0.0050	9563254	<0.0050	<0.0050	0.0050	9563254
Toluene	mg/kg	<0.050	9563254	<0.050	0.050	9563254	<0.050	<0.050	0.050	9563254
Ethylbenzene	mg/kg	<0.010	9563254	<0.010	0.010	9563254	<0.010	<0.010	0.010	9563254
m & p-Xylene	mg/kg	<0.040	9563254	<0.040	0.040	9563254	<0.040	<0.040	0.040	9563254
o-Xylene	mg/kg	<0.020	9563254	<0.020	0.020	9563254	<0.020	<0.020	0.020	9563254
F1 (C6-C10)	mg/kg	<3.5	9563254	<3.5	3.5	9563254	<3.5	<3.5	3.5	9563254
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95	9563254	97	N/A	9563254	95	98	N/A	9563254
4-Bromofluorobenzene (sur.)	%	103	9563254	103	N/A	9563254	102	100	N/A	9563254
D10-o-Xylene (sur.)	%	109	9563254	114	N/A	9563254	110	130	N/A	9563254
D4-1,2-Dichloroethane (sur.)	%	107	9563254	107	N/A	9563254	106	107	N/A	9563254
O-TERPHENYL (sur.)	%	94	9564487	98	N/A	9563568	89	73	N/A	9563345

RDL = Reportable Detection Limit
N/A = Not Applicable

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0126			WJ0127	WJ0128	WJ0129		
Sampling Date		2019/08/18 20:40			2019/08/18 20:40	2019/08/18 21:00	2019/08/18 21:00		
COC Number		591564-11-01			591564-11-01	591564-11-01	591564-11-01		
	UNITS	P3-13A	RDL	QC Batch	P3-13B	P3-14A	P3-14B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	3.7	3.0	9564487	<2.0	3.3	3.0	2.0	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	39	6.4	9564487	15	37	52	5.5	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	8.7	4.7	9564487	<3.9	8.8	15	3.9	9563345
Reached Baseline at C50	mg/kg	Yes	N/A	9564487	Yes	Yes	Yes	N/A	9563345
Physical Properties									
Moisture	%	14	0.30	9564271	6.9	17	20	0.30	9563159
Volatiles									
Xylenes (Total)	mg/kg	<0.045	0.045	9562594	<0.045	<0.045	<0.045	0.045	9562594
F1 (C6-C10) - BTEX	mg/kg	<3.5	3.5	9562594	<3.5	<3.5	<3.5	3.5	9562594
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	0.0050	9563254	<0.0050	<0.0050	<0.0050	0.0050	9563254
Toluene	mg/kg	<0.050	0.050	9563254	<0.050	<0.050	<0.050	0.050	9563254
Ethylbenzene	mg/kg	<0.010	0.010	9563254	<0.010	<0.010	<0.010	0.010	9563254
m & p-Xylene	mg/kg	<0.040	0.040	9563254	<0.040	<0.040	<0.040	0.040	9563254
o-Xylene	mg/kg	<0.020	0.020	9563254	<0.020	<0.020	<0.020	0.020	9563254
F1 (C6-C10)	mg/kg	<3.5	3.5	9563254	<3.5	<3.5	<3.5	3.5	9563254
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	92	N/A	9563254	98	98	91	N/A	9563254
4-Bromofluorobenzene (sur.)	%	105	N/A	9563254	103	102	105	N/A	9563254
D10-o-Xylene (sur.)	%	124	N/A	9563254	125	129	132	N/A	9563254
D4-1,2-Dichloroethane (sur.)	%	114	N/A	9563254	110	111	113	N/A	9563254
O-TERPHENYL (sur.)	%	86	N/A	9564487	73	81	105	N/A	9563345

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0130		WJ0131			WJ0132		
Sampling Date		2019/08/18 21:20		2019/08/18 21:20			2019/08/18 21:40		
COC Number		591564-11-01		591564-11-01			591564-11-01		
	UNITS	P3-15A	QC Batch	P3-15B	RDL	QC Batch	P3-16A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.0	9563568	6.0	3.0	9564487	23	2.0	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	46	9563568	35	6.4	9564487	100	5.5	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	<4.7	9563568	10	4.7	9564487	23	3.9	9563345
Reached Baseline at C50	mg/kg	Yes	9563568	Yes	N/A	9564487	Yes	N/A	9563345
Physical Properties									
Moisture	%	23	9563308	16	0.30	9564271	10	0.30	9563159
Volatiles									
Xylenes (Total)	mg/kg	<0.045	9562594	<0.045	0.045	9562594	<0.045	0.045	9562594
F1 (C6-C10) - BTEX	mg/kg	<3.5	9562594	<3.5	3.5	9562594	<3.5	3.5	9562594
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	9563254	<0.0050	0.0050	9563254	<0.0050	0.0050	9563254
Toluene	mg/kg	<0.050	9563254	<0.050	0.050	9563254	<0.050	0.050	9563254
Ethylbenzene	mg/kg	<0.010	9563254	<0.010	0.010	9563254	<0.010	0.010	9563254
m & p-Xylene	mg/kg	<0.040	9563254	<0.040	0.040	9563254	<0.040	0.040	9563254
o-Xylene	mg/kg	<0.020	9563254	<0.020	0.020	9563254	<0.020	0.020	9563254
F1 (C6-C10)	mg/kg	<3.5	9563254	<3.5	3.5	9563254	<3.5	3.5	9563254
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	96	9563254	92	N/A	9563254	94	N/A	9563254
4-Bromofluorobenzene (sur.)	%	101	9563254	105	N/A	9563254	105	N/A	9563254
D10-o-Xylene (sur.)	%	134	9563254	130	N/A	9563254	126	N/A	9563254
D4-1,2-Dichloroethane (sur.)	%	109	9563254	114	N/A	9563254	113	N/A	9563254
O-TERPHENYL (sur.)	%	96	9563568	83	N/A	9564487	101	N/A	9563345

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		WJ0133	WJ0134	WJ0135		
Sampling Date		2019/08/18 21:40	2019/08/18 21:00	2019/08/18 22:00		
COC Number		591564-11-01	591564-12-01	591564-12-01		
	UNITS	P3-16B	P3-17A	P3-18A	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	5.5	3.2	9.2	2.0	9563345
F3 (C16-C34 Hydrocarbons)	mg/kg	42	46	55	5.5	9563345
F4 (C34-C50 Hydrocarbons)	mg/kg	7.7	8.9	11	3.9	9563345
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	N/A	9563345
Physical Properties						
Moisture	%	18	17	17	0.30	9563159
Volatiles						
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	0.045	9562594
F1 (C6-C10) - BTEX	mg/kg	<3.5	<3.5	<3.5	3.5	9562594
Field Preserved Volatiles						
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	0.0050	9563205
Toluene	mg/kg	<0.050	<0.050	<0.050	0.050	9563205
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	0.010	9563205
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	0.040	9563205
o-Xylene	mg/kg	<0.020	<0.020	<0.020	0.020	9563205
F1 (C6-C10)	mg/kg	<3.5	<3.5	<3.5	3.5	9563205
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	96	96	95	N/A	9563205
4-Bromofluorobenzene (sur.)	%	104	102	102	N/A	9563205
D10-o-Xylene (sur.)	%	127	123	130	N/A	9563205
D4-1,2-Dichloroethane (sur.)	%	126	125	124	N/A	9563205
O-TERPHENYL (sur.)	%	88	95	80	N/A	9563345

RDL = Reportable Detection Limit
N/A = Not Applicable

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BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

PETROLEUM HYDROCARBONS (CCME)

BV Labs ID		WJ0064		WJ0121		WJ0128	WJ0132	WJ0135		
Sampling Date		2019/08/16 10:30		2019/08/18 16:20		2019/08/18 21:00	2019/08/18 21:40	2019/08/18 22:00		
COC Number		591564-02-01		591564-10-01		591564-11-01	591564-11-01	591564-12-01		
	UNITS	**MW-11A**	**RDL**	**P3-11A**	**RDL**	**P3-14A**	**P3-16A**	**P3-18A**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F3A (C16-C22)	mg/kg	8.9 (1)	2.4	22 (2)	3.7	7.3 (1)	38 (1)	18 (1)	1.7	9681449
F3B (C22-C34)	mg/kg	59 (1)	4.9	180 (2)	8.0	29 (1)	63 (1)	38 (1)	3.8	9681449
F2% (BIC)	mg/kg	NC	N/A	NC	N/A	NC	NC	NC	N/A	9678969
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	Yes	Yes	Yes	N/A	9681449
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	88	N/A	86	N/A	81	101	80	N/A	9681449

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs) at client request.
(2) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture.

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0060	WJ0061	WJ0062	WJ0063	WJ0064	WJ0065		
Sampling Date		2019/08/16 09:40	2019/08/16 09:40	2019/08/16 10:10	2019/08/16 10:10	2019/08/16 10:30	2019/08/16 10:30		
COC Number		591564-02-01	591564-02-01	591564-02-01	591564-02-01	591564-02-01	591564-02-01		
	UNITS	MW-9A	MW-9B	MW-10A	MW-10B	MW-11A	MW-11B	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9562576
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	81	70	82	78	70	88	N/A	9567618

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs ID		WJ0066	WJ0067	WJ0068	WJ0069	WJ0084	WJ0085		
Sampling Date		2019/08/16 11:00	2019/08/16 11:00	2019/08/16 11:30	2019/08/17 09:20	2019/08/17 09:20	2019/08/17 09:40		
COC Number		591564-02-01	591564-02-01	591564-02-01	591564-02-01	591564-07-01	591564-07-01		
	UNITS	MW-12A	MW-12B	MW-17B	MW-5A	MW-5B	MW-6A	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9562576
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	85	77	82	80	77	79	N/A	9567618

RDL = Reportable Detection Limit
N/A = Not Applicable

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BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0086	WJ0087	WJ0088	WJ0088	WJ0089	WJ0090		
Sampling Date		2019/08/17 09:40	2019/08/17 10:00	2019/08/17 10:00	2019/08/17 10:00	2019/08/17 10:20	2019/08/17 10:20		
COC Number		591564-07-01	591564-07-01	591564-07-01	591564-07-01	591564-07-01	591564-07-01		
	UNITS	MW-6B	MW-7A	MW-7B	MW-7B Lab-Dup	MW-8A	MW-8B	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567618
Total PCB	mg/kg	<0.010	<0.010	<0.010	N/A	<0.010	<0.010	0.010	9562576
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	78	78	82	121	91	86	N/A	9567618

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs ID		WJ0091	WJ0092	WJ0093		WJ0094	WJ0095		
Sampling Date		2019/08/17 18:40	2019/08/17 18:40	2019/08/17 17:40		2019/08/17 17:40	2019/08/17 18:00		
COC Number		591564-07-01	591564-07-01	591564-07-01		591564-08-01	591564-08-01		
	UNITS	P3-1A	P3-1B	P3-2A	QC Batch	P3-2B	P3-3A	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	9567618	<0.010	<0.010	0.010	9567772
Total PCB	mg/kg	<0.010	<0.010	<0.010	9562576	<0.010	<0.010	0.010	9562576
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	93	85	89	9567618	92	81	N/A	9567772

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0096	WJ0097	WJ0098	WJ0099	WJ0099	WJ0100		
Sampling Date		2019/08/17 18:00	2019/08/17 18:20	2019/08/17 18:20	2019/08/18 10:10	2019/08/18 10:10	2019/08/18 10:10		
COC Number		591564-08-01	591564-08-01	591564-08-01	591564-08-01	591564-08-01	591564-08-01		
	UNITS	P3-3B	P3-4A	P3-4B	MW-13A	MW-13A Lab-Dup	MW-13B	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	N/A	<0.010	0.010	9562576
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	84	84	89	90	81	85	N/A	9567772

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs ID		WJ0101	WJ0102	WJ0103	WJ0104	WJ0105	WJ0106		
Sampling Date		2019/08/18 11:10	2019/08/18 11:10	2019/08/18 12:20	2019/08/18 12:20	2019/08/18 09:10	2019/08/18 09:10		
COC Number		591564-08-01	591564-08-01	591564-08-01	591564-09-01	591564-09-01	591564-09-01		
	UNITS	MW-14A	MW-14B	MW-15A	MW-15B	MW-16A	MW-16B	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9567772
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9562576
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	88	86	95	91	91	93	N/A	9567772

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0107	WJ0108	WJ0109		WJ0110		WJ0111		
Sampling Date		2019/08/18 10:30	2019/08/18 11:30	2019/08/18 18:10		2019/08/18 18:10		2019/08/18 17:00		
COC Number		591564-09-01	591564-09-01	591564-09-01		591564-09-01		591564-09-01		
	UNITS	MW-18B	MW-19B	P3-5A	RDL	P3-5B	RDL	P3-6A	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9567772
Total PCB	mg/kg	<0.010	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	9562576
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	93	112	99	N/A	94	N/A	96	N/A	9567772

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs ID		WJ0112	WJ0113			WJ0114		WJ0115		
Sampling Date		2019/08/18 17:00	2019/08/18 17:20			2019/08/18 17:20		2019/08/18 17:50		
COC Number		591564-09-01	591564-09-01			591564-10-01		591564-10-01		
	UNITS	P3-6B	P3-7A	RDL	QC Batch	P3-7B	RDL	P3-8A	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1221	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1232	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1242	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1248	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1254	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1260	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1262	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Aroclor 1268	mg/kg	<0.010	<0.010	0.010	9568101	<0.050	0.050	<0.010	0.010	9568101
Total PCB	mg/kg	<0.010	<0.010	0.010	9562576	<0.050	0.050	<0.010	0.010	9562578
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	89	86	N/A	9568101	81	N/A	79	N/A	9568101

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0116		WJ0117	WJ0118	WJ0119		WJ0120		
Sampling Date		2019/08/18 17:50		2019/08/18 15:20	2019/08/18 15:20	2019/08/18 15:40		2019/08/18 15:40		
COC Number		591564-10-01		591564-10-01	591564-10-01	591564-10-01		591564-10-01		
	UNITS	P3-8B	RDL	P3-9A	P3-9B	P3-10A	QC Batch	P3-10B	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1221	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1232	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1242	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1248	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1254	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1260	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1262	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Aroclor 1268	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9568101	<0.010	0.010	9569721
Total PCB	mg/kg	<0.050	0.050	<0.010	<0.010	<0.010	9562578	<0.010	0.010	9562578
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	89	N/A	72	75	80	9568101	76	N/A	9569721

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs ID		WJ0120			WJ0121	WJ0122	WJ0123		
Sampling Date		2019/08/18 15:40			2019/08/18 16:20	2019/08/18 16:20	2019/08/18 16:40		
COC Number		591564-10-01			591564-10-01	591564-10-01	591564-10-01		
	UNITS	P3-10B Lab-Dup	RDL	QC Batch	P3-11A	P3-11B	P3-19B	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1221	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1232	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1242	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1248	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1254	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1260	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1262	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Aroclor 1268	mg/kg	<0.010	0.010	9569721	<0.050	<0.050	<0.050	0.050	9568101
Total PCB	mg/kg	N/A	0.010	9562578	<0.050	<0.050	<0.050	0.050	9562578
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	81	N/A	9569721	84	77	56	N/A	9568101

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0124	WJ0125	WJ0126	WJ0127	WJ0128	WJ0129		
Sampling Date		2019/08/18 20:20	2019/08/18 20:20	2019/08/18 20:40	2019/08/18 20:40	2019/08/18 21:00	2019/08/18 21:00		
COC Number		591564-11-01	591564-11-01	591564-11-01	591564-11-01	591564-11-01	591564-11-01		
	UNITS	P3-12A	P3-12B	P3-13A	P3-13B	P3-14A	P3-14B	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9568101
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9562578
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	68	65	51	76	69	62	N/A	9568101

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs ID		WJ0130		WJ0131	WJ0132	WJ0133	WJ0134		
Sampling Date		2019/08/18 21:20		2019/08/18 21:20	2019/08/18 21:40	2019/08/18 21:40	2019/08/18 21:00		
COC Number		591564-11-01		591564-11-01	591564-11-01	591564-11-01	591564-12-01		
	UNITS	P3-15A	QC Batch	P3-15B	P3-16A	P3-16B	P3-17A	RDL	QC Batch
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1221	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1232	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1242	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1248	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1254	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1260	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1262	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Aroclor 1268	mg/kg	<0.010	9568101	<0.010	<0.010	<0.010	<0.010	0.010	9569721
Total PCB	mg/kg	<0.010	9562578	<0.010	<0.010	<0.010	<0.010	0.010	9562578
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	54	9568101	75	57	78	78	N/A	9569721

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

BV Labs ID		WJ0135		
Sampling Date		2019/08/18 22:00		
COC Number		591564-12-01		
	UNITS	P3-18A	RDL	QC Batch
Polychlorinated Biphenyls				
Aroclor 1016	mg/kg	<0.010	0.010	9569721
Aroclor 1221	mg/kg	<0.010	0.010	9569721
Aroclor 1232	mg/kg	<0.010	0.010	9569721
Aroclor 1242	mg/kg	<0.010	0.010	9569721
Aroclor 1248	mg/kg	<0.010	0.010	9569721
Aroclor 1254	mg/kg	<0.010	0.010	9569721
Aroclor 1260	mg/kg	<0.010	0.010	9569721
Aroclor 1262	mg/kg	<0.010	0.010	9569721
Aroclor 1268	mg/kg	<0.010	0.010	9569721
Total PCB	mg/kg	<0.010	0.010	9562578
Surrogate Recovery (%)				
NONACHLOROBIPHENYL (sur.)	%	71	N/A	9569721

RDL = Reportable Detection Limit
N/A = Not Applicable

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0060		WJ0061		WJ0062		WJ0063		
Sampling Date		2019/08/16 09:40		2019/08/16 09:40		2019/08/16 10:10		2019/08/16 10:10		
COC Number		591564-02-01		591564-02-01		591564-02-01		591564-02-01		
	UNITS	MW-9A	QC Batch	MW-9B	QC Batch	MW-10A	QC Batch	MW-10B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	1.4	9563951	1.5	9563995	1.1	9564089	<1.0	1.0	9563951
Total Cadmium (Cd)	mg/kg	<0.050	9563951	<0.050	9563995	<0.050	9564089	<0.050	0.050	9563951
Total Chromium (Cr)	mg/kg	4.9	9563951	5.5	9563995	4.5	9564089	3.2	1.0	9563951
Total Cobalt (Co)	mg/kg	2.3	9563951	2.3	9563995	2.0	9564089	1.5	0.50	9563951
Total Copper (Cu)	mg/kg	13	9563951	21	9563995	7.1	9564089	6.5	1.0	9563951
Total Lead (Pb)	mg/kg	3.1	9563951	7.4	9563995	1.4	9564089	1.1	0.50	9563951
Total Nickel (Ni)	mg/kg	4.2	9563951	4.6	9563995	3.6	9564089	2.8	1.0	9563951
Total Zinc (Zn)	mg/kg	6.9 (1)	9563951	11 (1)	9563995	5.3 (1)	9564089	4.1 (1)	1.0	9563951

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0064		WJ0065	WJ0066		WJ0067	WJ0068		
Sampling Date		2019/08/16 10:30		2019/08/16 10:30	2019/08/16 11:00		2019/08/16 11:00	2019/08/16 11:30		
COC Number		591564-02-01		591564-02-01	591564-02-01		591564-02-01	591564-02-01		
	UNITS	MW-11A	QC Batch	MW-11B	MW-12A	QC Batch	MW-12B	MW-17B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	9563951	<1.0	<1.0	9563995	1.1	<1.0	1.0	9563951
Total Cadmium (Cd)	mg/kg	<0.050	9563951	<0.050	<0.050	9563995	<0.050	<0.050	0.050	9563951
Total Chromium (Cr)	mg/kg	4.4	9563951	3.8	3.1	9563995	4.5	3.9	1.0	9563951
Total Cobalt (Co)	mg/kg	1.8	9563951	1.6	1.3	9563995	2.2	2.0	0.50	9563951
Total Copper (Cu)	mg/kg	11	9563951	6.6	6.3	9563995	13	12	1.0	9563951
Total Lead (Pb)	mg/kg	7.3	9563951	1.2	1.1	9563995	1.3	1.2	0.50	9563951
Total Nickel (Ni)	mg/kg	3.6	9563951	3.0	2.7	9563995	4.0	4.0	1.0	9563951
Total Zinc (Zn)	mg/kg	9.3 (1)	9563951	4.8 (1)	3.7 (1)	9563995	6.5 (1)	5.7 (1)	1.0	9563951

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0068	WJ0069	WJ0084		WJ0085	WJ0086		
Sampling Date		2019/08/16 11:30	2019/08/17 09:20	2019/08/17 09:20		2019/08/17 09:40	2019/08/17 09:40		
COC Number		591564-02-01	591564-02-01	591564-07-01		591564-07-01	591564-07-01		
	UNITS	MW-17B Lab-Dup	MW-5A	MW-5B	QC Batch	MW-6A	MW-6B	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	<1.0	<1.0	1.2	9563951	<1.0	<1.0	1.0	9564089
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	9563951	<0.050	<0.050	0.050	9564089
Total Chromium (Cr)	mg/kg	4.3	4.9	4.5	9563951	4.5	4.6	1.0	9564089
Total Cobalt (Co)	mg/kg	2.0	2.0	1.6	9563951	2.1	2.0	0.50	9564089
Total Copper (Cu)	mg/kg	12	6.2	5.7	9563951	8.4	11	1.0	9564089
Total Lead (Pb)	mg/kg	1.2	1.9	1.5	9563951	1.4	1.2	0.50	9564089
Total Nickel (Ni)	mg/kg	3.5	3.4	2.8	9563951	4.2	3.9	1.0	9564089
Total Zinc (Zn)	mg/kg	6.0	6.9 (1)	5.7 (1)	9563951	6.7 (1)	6.3 (1)	1.0	9564089

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0087		WJ0088	WJ0089	WJ0090		WJ0091		
Sampling Date		2019/08/17 10:00		2019/08/17 10:00	2019/08/17 10:20	2019/08/17 10:20		2019/08/17 18:40		
COC Number		591564-07-01		591564-07-01	591564-07-01	591564-07-01		591564-07-01		
	UNITS	MW-7A	QC Batch	MW-7B	MW-8A	MW-8B	QC Batch	P3-1A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	9563951	<1.0	<1.0	<1.0	9564089	1.5	1.0	9563995
Total Cadmium (Cd)	mg/kg	<0.050	9563951	<0.050	<0.050	<0.050	9564089	<0.050	0.050	9563995
Total Chromium (Cr)	mg/kg	5.2	9563951	5.1	2.9	3.2	9564089	4.2	1.0	9563995
Total Cobalt (Co)	mg/kg	2.4	9563951	2.0	1.1	1.3	9564089	1.4	0.50	9563995
Total Copper (Cu)	mg/kg	9.6	9563951	12	4.6	3.7	9564089	6.9	1.0	9563995
Total Lead (Pb)	mg/kg	1.8	9563951	1.6	0.59	1.1	9564089	1.9	0.50	9563995
Total Nickel (Ni)	mg/kg	4.6	9563951	3.7	2.1	2.3	9564089	2.8	1.0	9563995
Total Zinc (Zn)	mg/kg	8.7 (1)	9563951	7.5 (1)	3.8 (1)	4.0 (1)	9564089	6.1 (1)	1.0	9563995

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0092		WJ0093	WJ0094		WJ0095	WJ0096		
Sampling Date		2019/08/17 18:40		2019/08/17 17:40	2019/08/17 17:40		2019/08/17 18:00	2019/08/17 18:00		
COC Number		591564-07-01		591564-07-01	591564-08-01		591564-08-01	591564-08-01		
	UNITS	P3-1B	QC Batch	P3-2A	P3-2B	QC Batch	P3-3A	P3-3B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.1	9564089	1.1	<1.0	9563951	1.4	1.3	1.0	9564089
Total Cadmium (Cd)	mg/kg	<0.050	9564089	<0.050	<0.050	9563951	0.10	0.11	0.050	9564089
Total Chromium (Cr)	mg/kg	3.9	9564089	5.3	5.2	9563951	5.1	7.3	1.0	9564089
Total Cobalt (Co)	mg/kg	1.2	9564089	2.2	1.9	9563951	2.1	2.8	0.50	9564089
Total Copper (Cu)	mg/kg	6.8	9564089	13	8.8	9563951	14	11	1.0	9564089
Total Lead (Pb)	mg/kg	2.4	9564089	1.9	1.6	9563951	4.6	2.6	0.50	9564089
Total Nickel (Ni)	mg/kg	2.4	9564089	4.7	4.1	9563951	4.2	5.7	1.0	9564089
Total Zinc (Zn)	mg/kg	5.3 (1)	9564089	7.8 (1)	6.4 (1)	9563951	8.5	6.9 (1)	1.0	9564089

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0097		WJ0098		WJ0099		WJ0100		
Sampling Date		2019/08/17 18:20		2019/08/17 18:20		2019/08/18 10:10		2019/08/18 10:10		
COC Number		591564-08-01		591564-08-01		591564-08-01		591564-08-01		
	UNITS	P3-4A	QC Batch	P3-4B	QC Batch	MW-13A	QC Batch	MW-13B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	9563951	<1.0	9564089	<1.0	9563995	<1.0	1.0	9564089
Total Cadmium (Cd)	mg/kg	<0.050	9563951	<0.050	9564089	0.064	9563995	<0.050	0.050	9564089
Total Chromium (Cr)	mg/kg	4.7	9563951	4.7	9564089	3.6	9563995	3.3	1.0	9564089
Total Cobalt (Co)	mg/kg	2.0	9563951	1.8	9564089	1.5	9563995	1.4	0.50	9564089
Total Copper (Cu)	mg/kg	6.9	9563951	6.6	9564089	6.7	9563995	7.2	1.0	9564089
Total Lead (Pb)	mg/kg	1.5	9563951	1.2	9564089	4.1	9563995	1.7	0.50	9564089
Total Nickel (Ni)	mg/kg	3.9	9563951	3.5	9564089	2.8	9563995	2.5	1.0	9564089
Total Zinc (Zn)	mg/kg	6.6 (1)	9563951	5.8 (1)	9564089	6.6 (1)	9563995	4.8 (1)	1.0	9564089

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0101		WJ0102		WJ0103		WJ0104		
Sampling Date		2019/08/18 11:10		2019/08/18 11:10		2019/08/18 12:20		2019/08/18 12:20		
COC Number		591564-08-01		591564-08-01		591564-08-01		591564-09-01		
	UNITS	MW-14A	QC Batch	MW-14B	QC Batch	MW-15A	QC Batch	MW-15B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.0	9563951	2.1	9564089	<1.0	9563951	<1.0	1.0	9563995
Total Cadmium (Cd)	mg/kg	<0.050	9563951	<0.050	9564089	<0.050	9563951	<0.050	0.050	9563995
Total Chromium (Cr)	mg/kg	2.8	9563951	2.9	9564089	2.6	9563951	4.1	1.0	9563995
Total Cobalt (Co)	mg/kg	1.2	9563951	1.2	9564089	1.2	9563951	1.4	0.50	9563995
Total Copper (Cu)	mg/kg	4.4	9563951	4.2	9564089	5.7	9563951	6.7	1.0	9563995
Total Lead (Pb)	mg/kg	1.2	9563951	1.2	9564089	0.97	9563951	1.5	0.50	9563995
Total Nickel (Ni)	mg/kg	2.7	9563951	3.1	9564089	2.0	9563951	2.4	1.0	9563995
Total Zinc (Zn)	mg/kg	4.2 (1)	9563951	4.9 (1)	9564089	5.2 (1)	9563951	5.6 (1)	1.0	9563995

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0105		WJ0106	WJ0107		WJ0108	WJ0109		
Sampling Date		2019/08/18 09:10		2019/08/18 09:10	2019/08/18 10:30		2019/08/18 11:30	2019/08/18 18:10		
COC Number		591564-09-01		591564-09-01	591564-09-01		591564-09-01	591564-09-01		
	UNITS	MW-16A	QC Batch	MW-16B	MW-18B	QC Batch	MW-19B	P3-5A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	9563905	<1.0	<1.0	9563995	2.0	<1.0	1.0	9563951
Total Cadmium (Cd)	mg/kg	0.057	9563905	<0.050	<0.050	9563995	<0.050	<0.050	0.050	9563951
Total Chromium (Cr)	mg/kg	2.6	9563905	2.3	3.8	9563995	3.0	2.4	1.0	9563951
Total Cobalt (Co)	mg/kg	0.98	9563905	0.82	1.3	9563995	1.3	1.0	0.50	9563951
Total Copper (Cu)	mg/kg	4.1	9563905	2.0	6.9	9563995	3.7	4.9	1.0	9563951
Total Lead (Pb)	mg/kg	1.9	9563905	1.5	1.6	9563995	1.0	0.63	0.50	9563951
Total Nickel (Ni)	mg/kg	2.2	9563905	1.8	2.4	9563995	2.8	2.0	1.0	9563951
Total Zinc (Zn)	mg/kg	7.9 (1)	9563905	4.4 (1)	4.1 (1)	9563995	4.0 (1)	3.5 (1)	1.0	9563951

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0110		WJ0111		WJ0112		WJ0113		
Sampling Date		2019/08/18 18:10		2019/08/18 17:00		2019/08/18 17:00		2019/08/18 17:20		
COC Number		591564-09-01		591564-09-01		591564-09-01		591564-09-01		
	UNITS	P3-5B	QC Batch	P3-6A	QC Batch	P3-6B	QC Batch	P3-7A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	9568080	<1.0	9563951	<1.0	9563995	3.7	1.0	9563951
Total Cadmium (Cd)	mg/kg	0.16	9568080	<0.050	9563951	<0.050	9563995	<0.050	0.050	9563951
Total Chromium (Cr)	mg/kg	3.0	9568080	2.1	9563951	2.5	9563995	7.4	1.0	9563951
Total Cobalt (Co)	mg/kg	1.6	9568080	0.91	9563951	0.97	9563995	3.2	0.50	9563951
Total Copper (Cu)	mg/kg	11	9568080	2.8	9563951	9.0	9563995	14	1.0	9563951
Total Lead (Pb)	mg/kg	1.2	9568080	0.68	9563951	0.70	9563995	4.8	0.50	9563951
Total Nickel (Ni)	mg/kg	4.0	9568080	1.7	9563951	1.9	9563995	6.1	1.0	9563951
Total Zinc (Zn)	mg/kg	8.4 (1)	9568080	3.3 (1)	9563951	4.2 (1)	9563995	11 (1)	1.0	9563951

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0114	WJ0115		WJ0116		WJ0117		
Sampling Date		2019/08/18 17:20	2019/08/18 17:50		2019/08/18 17:50		2019/08/18 15:20		
COC Number		591564-10-01	591564-10-01		591564-10-01		591564-10-01		
	UNITS	P3-7B	P3-8A	QC Batch	P3-8B	QC Batch	P3-9A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	2.6	2.0	9564089	<1.0	9563951	1.1	1.0	9563905
Total Cadmium (Cd)	mg/kg	0.091	<0.050	9564089	<0.050	9563951	<0.050	0.050	9563905
Total Chromium (Cr)	mg/kg	6.6	7.7	9564089	3.6	9563951	4.1	1.0	9563905
Total Cobalt (Co)	mg/kg	2.9	3.5	9564089	1.6	9563951	2.2	0.50	9563905
Total Copper (Cu)	mg/kg	13	13	9564089	5.9	9563951	8.2	1.0	9563905
Total Lead (Pb)	mg/kg	6.2	7.5	9564089	2.5	9563951	1.5	0.50	9563905
Total Nickel (Ni)	mg/kg	5.3	5.6	9564089	3.1	9563951	3.8	1.0	9563905
Total Zinc (Zn)	mg/kg	12 (1)	11 (1)	9564089	5.0 (1)	9563951	7.1 (1)	1.0	9563905

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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BV Labs Job #: B970574
Report Date: 2019/11/25

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0118	WJ0119	WJ0120	WJ0121		WJ0122		
Sampling Date		2019/08/18 15:20	2019/08/18 15:40	2019/08/18 15:40	2019/08/18 16:20		2019/08/18 16:20		
COC Number		591564-10-01	591564-10-01	591564-10-01	591564-10-01		591564-10-01		
	UNITS	P3-9B	P3-10A	P3-10B	P3-11A	QC Batch	P3-11B	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	1.2	<1.0	<1.0	<1.0	9563995	1.4	1.0	9564089
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	<0.050	9563995	<0.050	0.050	9564089
Total Chromium (Cr)	mg/kg	4.1	4.4	2.8	3.1	9563995	6.2	1.0	9564089
Total Cobalt (Co)	mg/kg	2.4	2.0	1.3	1.6	9563995	2.7	0.50	9564089
Total Copper (Cu)	mg/kg	10	11	5.3	7.0	9563995	16	1.0	9564089
Total Lead (Pb)	mg/kg	1.6	1.3	0.95	0.81	9563995	2.2	0.50	9564089
Total Nickel (Ni)	mg/kg	3.4	3.6	2.5	2.9	9563995	5.1	1.0	9564089
Total Zinc (Zn)	mg/kg	7.2 (1)	9.0 (1)	4.4 (1)	4.6 (1)	9563995	7.9 (1)	1.0	9564089

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0123	WJ0124		WJ0125	WJ0126		WJ0127		
Sampling Date		2019/08/18 16:40	2019/08/18 20:20		2019/08/18 20:20	2019/08/18 20:40		2019/08/18 20:40		
COC Number		591564-10-01	591564-11-01		591564-11-01	591564-11-01		591564-11-01		
	UNITS	P3-19B	P3-12A	QC Batch	P3-12B	P3-13A	QC Batch	P3-13B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	1.8	<1.0	9564089	<1.0	1.2	9563951	1.2	1.0	9563995
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	9564089	<0.050	<0.050	9563951	<0.050	0.050	9563995
Total Chromium (Cr)	mg/kg	5.8	4.2	9564089	3.9	2.7	9563951	2.6	1.0	9563995
Total Cobalt (Co)	mg/kg	2.5	1.7	9564089	1.5	0.94	9563951	1.1	0.50	9563995
Total Copper (Cu)	mg/kg	13	5.6	9564089	5.0	2.9	9563951	67 (1)	1.0	9563995
Total Lead (Pb)	mg/kg	2.1	1.4	9564089	1.4	1.9	9563951	1.9	0.50	9563995
Total Nickel (Ni)	mg/kg	4.8	3.0	9564089	3.0	2.1	9563951	2.2	1.0	9563995
Total Zinc (Zn)	mg/kg	7.3 (2)	6.6 (2)	9564089	5.9 (2)	6.1 (2)	9563951	6.8 (3)	1.0	9563995

RDL = Reportable Detection Limit
(1) Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.
(2) Detection limits calculated based on method detection limits (MDLs) at client request.
(3) Detection limits calculated based on method detection limits (MDLs) at client request.
Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.

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BV Labs Job #: B970574
Report Date: 2019/11/25

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Client Project #: 30000251
Sampler Initials: EH

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WJ0127	WJ0128		WJ0129		WJ0130	WJ0131		
Sampling Date		2019/08/18 20:40	2019/08/18 21:00		2019/08/18 21:00		2019/08/18 21:20	2019/08/18 21:20		
COC Number		591564-11-01	591564-11-01		591564-11-01		591564-11-01	591564-11-01		
	UNITS	P3-13B Lab-Dup	P3-14A	QC Batch	P3-14B	QC Batch	P3-15A	P3-15B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	1.3	<1.0	9563995	1.0	9563905	1.0	1.7	1.0	9563995
Total Cadmium (Cd)	mg/kg	0.064	<0.050	9563995	<0.050	9563905	<0.050	<0.050	0.050	9563995
Total Chromium (Cr)	mg/kg	2.6	4.0	9563995	4.6	9563905	3.4	3.7	1.0	9563995
Total Cobalt (Co)	mg/kg	0.96	1.2	9563995	1.1	9563905	1.2	1.2	0.50	9563995
Total Copper (Cu)	mg/kg	2.2 (1)	6.3	9563995	8.8	9563905	49	6.9	1.0	9563995
Total Lead (Pb)	mg/kg	1.9	1.8	9563995	1.8	9563905	1.9	2.6	0.50	9563995
Total Nickel (Ni)	mg/kg	2.2	2.5	9563995	2.7	9563905	2.8	2.3	1.0	9563995
Total Zinc (Zn)	mg/kg	9.3 (1)	9.2 (2)	9563995	8.5 (2)	9563905	15 (2)	6.5 (2)	1.0	9563995

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0132	WJ0133		WJ0134		WJ0135		
Sampling Date		2019/08/18 21:40	2019/08/18 21:40		2019/08/18 21:00		2019/08/18 22:00		
COC Number		591564-11-01	591564-11-01		591564-12-01		591564-12-01		
	UNITS	P3-16A	P3-16B	QC Batch	P3-17A	QC Batch	P3-18A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	2.9	1.9	9563995	1.2	9563905	2.2	1.0	9563995
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	9563995	<0.050	9563905	<0.050	0.050	9563995
Total Chromium (Cr)	mg/kg	3.7	3.4	9563995	2.7	9563905	3.1	1.0	9563995
Total Cobalt (Co)	mg/kg	1.6	1.3	9563995	0.95	9563905	1.5	0.50	9563995
Total Copper (Cu)	mg/kg	13	16	9563995	3.4	9563905	11	1.0	9563995
Total Lead (Pb)	mg/kg	4.8	3.2	9563995	2.4	9563905	4.0	0.50	9563995
Total Nickel (Ni)	mg/kg	7.6	6.8	9563995	3.0	9563905	6.1	1.0	9563995
Total Zinc (Zn)	mg/kg	8.0 (1)	8.0 (1)	9563995	5.5 (1)	9563905	7.4 (1)	1.0	9563995

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.4°C
Package 2	4.4°C
Package 3	5.2°C
Package 4	2.9°C
Package 5	6.2°C
Package 6	1.1°C
Package 7	5.8°C

BTEXF1-4: F24:Detection limits calculated based on method detection limits (MDLs) at client request.

Report re-issued with updated detection limits as per client request on 2019.10.09.

Version 3: Report reissued to include results for chromatogram F3 range and/or sub-fraction concentrations for F3a and F3b on samples P3-11A, MW-11A, P3-14A, P3-16A, P3-18A as per client request received 2019/11/18

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL) Comments

Sample WJ0110 [P3-5B] Polychlorinated Biphenyls in Soil: Detection limits raised due to high moisture content, samples contain => 50% moisture.
Sample WJ0114 [P3-7B] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference.
Sample WJ0116 [P3-8B] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference.
Sample WJ0121 [P3-11A] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference and high moisture content, samples contain => 50% moisture.
Sample WJ0122 [P3-11B] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference.
Sample WJ0123 [P3-19B] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9563141	O-TERPHENYL (sur.)	2019/08/27	78	60 - 140	84	60 - 140	100	%				
9563205	1,4-Difluorobenzene (sur.)	2019/08/27	93	50 - 140	97	50 - 140	100	%				
9563205	4-Bromofluorobenzene (sur.)	2019/08/27	106	50 - 140	105	50 - 140	104	%				
9563205	D10-o-Xylene (sur.)	2019/08/27	134	50 - 140	123	50 - 140	114	%				
9563205	D4-1,2-Dichloroethane (sur.)	2019/08/27	114	50 - 140	120	50 - 140	118	%				
9563250	1,4-Difluorobenzene (sur.)	2019/08/27	96	50 - 140	96	50 - 140	96	%				
9563250	4-Bromofluorobenzene (sur.)	2019/08/27	102	50 - 140	105	50 - 140	104	%				
9563250	D10-o-Xylene (sur.)	2019/08/27	118	50 - 140	117	50 - 140	111	%				
9563250	D4-1,2-Dichloroethane (sur.)	2019/08/27	113	50 - 140	111	50 - 140	105	%				
9563254	1,4-Difluorobenzene (sur.)	2019/08/26	95	50 - 140	93	50 - 140	100	%				
9563254	4-Bromofluorobenzene (sur.)	2019/08/26	103	50 - 140	104	50 - 140	101	%				
9563254	D10-o-Xylene (sur.)	2019/08/26	122	50 - 140	122	50 - 140	121	%				
9563254	D4-1,2-Dichloroethane (sur.)	2019/08/26	115	50 - 140	110	50 - 140	102	%				
9563345	O-TERPHENYL (sur.)	2019/08/27	67	60 - 140	83	60 - 140	95	%				
9563367	1,4-Difluorobenzene (sur.)	2019/08/26	97	50 - 140	95	50 - 140	95	%				
9563367	4-Bromofluorobenzene (sur.)	2019/08/26	101	50 - 140	102	50 - 140	103	%				
9563367	D10-o-Xylene (sur.)	2019/08/26	109	50 - 140	114	50 - 140	111	%				
9563367	D4-1,2-Dichloroethane (sur.)	2019/08/26	109	50 - 140	105	50 - 140	102	%				
9563568	O-TERPHENYL (sur.)	2019/08/27	109	60 - 140	91	60 - 140	105	%				
9564487	O-TERPHENYL (sur.)	2019/08/28	83	60 - 140	84	60 - 140	82	%				
9567618	NONACHLOROBIPHENYL (sur.)	2019/08/29	83	50 - 130	79	50 - 130	75	%				
9567772	NONACHLOROBIPHENYL (sur.)	2019/08/30	95	50 - 130	88	50 - 130	92	%				
9568101	NONACHLOROBIPHENYL (sur.)	2019/08/30	75	50 - 130	83	50 - 130	93	%				
9569721	NONACHLOROBIPHENYL (sur.)	2019/08/30	75	50 - 130	85	50 - 130	85	%				
9681449	O-TERPHENYL (sur.)	2019/08/27			83	60 - 140	95	%				
9563016	Moisture	2019/08/27					<0.30	%	2.6	20		
9563141	F2 (C10-C16 Hydrocarbons)	2019/08/27	87	60 - 140	95	60 - 140	<3.0	mg/kg	NC	40		
9563141	F3 (C16-C34 Hydrocarbons)	2019/08/27	86	60 - 140	93	60 - 140	<6.4	mg/kg	NC	40		
9563141	F4 (C34-C50 Hydrocarbons)	2019/08/27	81	60 - 140	87	60 - 140	<4.7	mg/kg	NC	40		
9563159	Moisture	2019/08/27					<0.30	%	1.4	20		
9563205	Benzene	2019/08/27	112	50 - 140	124	60 - 130	<0.0050	mg/kg	NC	50		
9563205	Ethylbenzene	2019/08/27	118	50 - 140	121	60 - 130	<0.010	mg/kg	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9563205	F1 (C6-C10)	2019/08/27	115	60 - 140	121	60 - 140	<3.5	mg/kg	NC	30		
9563205	m & p-Xylene	2019/08/27	119	50 - 140	122	60 - 130	<0.040	mg/kg	NC	50		
9563205	o-Xylene	2019/08/27	116	50 - 140	115	60 - 130	<0.020	mg/kg	NC	50		
9563205	Toluene	2019/08/27	113	50 - 140	120	60 - 130	<0.050	mg/kg	NC	50		
9563250	Benzene	2019/08/27	111	50 - 140	111	60 - 130	<0.0050	mg/kg	NC	50		
9563250	Ethylbenzene	2019/08/27	115	50 - 140	114	60 - 130	<0.010	mg/kg	NC	50		
9563250	F1 (C6-C10)	2019/08/27	115	60 - 140	110	60 - 140	<3.5	mg/kg	NC	30		
9563250	m & p-Xylene	2019/08/27	115	50 - 140	119	60 - 130	<0.040	mg/kg	NC	50		
9563250	o-Xylene	2019/08/27	111	50 - 140	112	60 - 130	<0.020	mg/kg	NC	50		
9563250	Toluene	2019/08/27	110	50 - 140	113	60 - 130	<0.050	mg/kg	NC	50		
9563254	Benzene	2019/08/26	117	50 - 140	114	60 - 130	<0.0050	mg/kg	NC	50		
9563254	Ethylbenzene	2019/08/26	120	50 - 140	118	60 - 130	<0.010	mg/kg	NC	50		
9563254	F1 (C6-C10)	2019/08/26	119	60 - 140	120	60 - 140	<3.5	mg/kg	NC	30		
9563254	m & p-Xylene	2019/08/26	118	50 - 140	121	60 - 130	<0.040	mg/kg	NC	50		
9563254	o-Xylene	2019/08/26	115	50 - 140	115	60 - 130	<0.020	mg/kg	NC	50		
9563254	Toluene	2019/08/26	114	50 - 140	116	60 - 130	<0.050	mg/kg	NC	50		
9563308	Moisture	2019/08/27					<0.30	%	3.3	20		
9563345	F2 (C10-C16 Hydrocarbons)	2019/08/27	75	60 - 140	94	60 - 140	<2.0	mg/kg	25	40		
9563345	F3 (C16-C34 Hydrocarbons)	2019/08/27	77	60 - 140	96	60 - 140	<5.5	mg/kg	37	40		
9563345	F4 (C34-C50 Hydrocarbons)	2019/08/27	75	60 - 140	93	60 - 140	<3.9	mg/kg	31	40		
9563367	Benzene	2019/08/27	99	50 - 140	110	60 - 130	<0.0050	mg/kg	NC	50		
9563367	Ethylbenzene	2019/08/27	107	50 - 140	113	60 - 130	<0.010	mg/kg	NC	50		
9563367	F1 (C6-C10)	2019/08/27	103	60 - 140	123	60 - 140	<3.5	mg/kg	NC	30		
9563367	m & p-Xylene	2019/08/27	105	50 - 140	115	60 - 130	<0.040	mg/kg	NC	50		
9563367	o-Xylene	2019/08/27	102	50 - 140	110	60 - 130	<0.020	mg/kg	NC	50		
9563367	Toluene	2019/08/27	100	50 - 140	112	60 - 130	<0.050	mg/kg	NC	50		
9563568	F2 (C10-C16 Hydrocarbons)	2019/08/27	117	60 - 140	96	60 - 140	<3.0	mg/kg	NC	40		
9563568	F3 (C16-C34 Hydrocarbons)	2019/08/27	120	60 - 140	99	60 - 140	<6.4	mg/kg	NC	40		
9563568	F4 (C34-C50 Hydrocarbons)	2019/08/27	115	60 - 140	95	60 - 140	<4.7	mg/kg	NC	40		
9563905	Total Arsenic (As)	2019/08/27	96	75 - 125	93	80 - 120	<1.0	mg/kg	1.1	30	99	53 - 147
9563905	Total Cadmium (Cd)	2019/08/27	97	75 - 125	92	80 - 120	<0.050	mg/kg	5.8	30	101	72 - 128
9563905	Total Chromium (Cr)	2019/08/27	101	75 - 125	96	80 - 120	<1.0	mg/kg	11	30	87	59 - 141

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9563905	Total Cobalt (Co)	2019/08/27	93	75 - 125	94	80 - 120	<0.50	mg/kg	17	30	93	58 - 142
9563905	Total Copper (Cu)	2019/08/27	93	75 - 125	97	80 - 120	<1.0	mg/kg	1.1	30	106	83 - 117
9563905	Total Lead (Pb)	2019/08/27	85	75 - 125	96	80 - 120	<0.50	mg/kg	3.0	35	98	79 - 121
9563905	Total Nickel (Ni)	2019/08/27	91	75 - 125	93	80 - 120	<1.0	mg/kg	14	30	101	79 - 121
9563905	Total Zinc (Zn)	2019/08/27	100	75 - 125	93	80 - 120	<10	mg/kg	0.25	30	98	79 - 121
9563951	Total Arsenic (As)	2019/08/27	101	75 - 125	95	80 - 120	<1.0	mg/kg	NC	30	98	53 - 147
9563951	Total Cadmium (Cd)	2019/08/27	101	75 - 125	92	80 - 120	<0.050	mg/kg	NC	30	89	72 - 128
9563951	Total Chromium (Cr)	2019/08/27	107	75 - 125	99	80 - 120	<1.0	mg/kg	9.8	30	79	59 - 141
9563951	Total Cobalt (Co)	2019/08/27	100	75 - 125	96	80 - 120	<0.50	mg/kg	3.0	30	90	58 - 142
9563951	Total Copper (Cu)	2019/08/27	103	75 - 125	98	80 - 120	<1.0	mg/kg	0.16	30	105	83 - 117
9563951	Total Lead (Pb)	2019/08/27	98	75 - 125	96	80 - 120	<0.50	mg/kg	7.7	35	96	79 - 121
9563951	Total Nickel (Ni)	2019/08/27	99	75 - 125	95	80 - 120	<1.0	mg/kg	14	30	98	79 - 121
9563951	Total Zinc (Zn)	2019/08/27	100	75 - 125	95	80 - 120	<10	mg/kg	4.5	30	99	79 - 121
9563995	Total Arsenic (As)	2019/08/28	102	75 - 125	95	80 - 120	<1.0	mg/kg	12	30	98	53 - 147
9563995	Total Cadmium (Cd)	2019/08/28	104	75 - 125	93	80 - 120	<0.050	mg/kg	25	30	95	72 - 128
9563995	Total Chromium (Cr)	2019/08/28	107	75 - 125	97	80 - 120	<1.0	mg/kg	1.7	30	89	59 - 141
9563995	Total Cobalt (Co)	2019/08/28	100	75 - 125	95	80 - 120	<0.50	mg/kg	12	30	91	58 - 142
9563995	Total Copper (Cu)	2019/08/28	NC	75 - 125	98	80 - 120	<1.0	mg/kg	187 (1)	30	107	83 - 117
9563995	Total Lead (Pb)	2019/08/28	99	75 - 125	96	80 - 120	<0.50	mg/kg	0.19	35	93	79 - 121
9563995	Total Nickel (Ni)	2019/08/28	100	75 - 125	95	80 - 120	<1.0	mg/kg	2.0	30	97	79 - 121
9563995	Total Zinc (Zn)	2019/08/28	103	75 - 125	94	80 - 120	<10	mg/kg	31 (1)	30	97	79 - 121
9564089	Total Arsenic (As)	2019/08/27	93	75 - 125	93	80 - 120	<1.0	mg/kg			102	53 - 147
9564089	Total Cadmium (Cd)	2019/08/28	94	75 - 125	91	80 - 120	<0.050	mg/kg	20	30	100	72 - 128
9564089	Total Chromium (Cr)	2019/08/28	98	75 - 125	95	80 - 120	<1.0	mg/kg	8.8	30	91	59 - 141
9564089	Total Cobalt (Co)	2019/08/27	91	75 - 125	94	80 - 120	<0.50	mg/kg			91	58 - 142
9564089	Total Copper (Cu)	2019/08/28	103	75 - 125	96	80 - 120	<1.0	mg/kg	21	30	110	83 - 117
9564089	Total Lead (Pb)	2019/08/28	NC	75 - 125	94	80 - 120	<0.50	mg/kg	21	35	96	79 - 121
9564089	Total Nickel (Ni)	2019/08/28	103	75 - 125	93	80 - 120	<1.0	mg/kg	5.6	30	100	79 - 121
9564089	Total Zinc (Zn)	2019/08/28	NC	75 - 125	93	80 - 120	<10	mg/kg	22	30	100	79 - 121
9564271	Moisture	2019/08/28					<0.30	%	1.7	20		
9564487	F2 (C10-C16 Hydrocarbons)	2019/08/28	95	60 - 140	91	60 - 140	<3.0	mg/kg	NC	40		
9564487	F3 (C16-C34 Hydrocarbons)	2019/08/28	98	60 - 140	93	60 - 140	<6.4	mg/kg	17	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9564487	F4 (C34-C50 Hydrocarbons)	2019/08/28	94	60 - 140	92	60 - 140	<4.7	mg/kg	NC	40		
9567618	Aroclor 1016	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1221	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1232	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1242	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1248	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1254	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1260	2019/08/29	96	50 - 130	101	50 - 130	<0.010	mg/kg	NC	50		
9567618	Aroclor 1262	2019/08/29					<0.010	mg/kg	NC	50		
9567618	Aroclor 1268	2019/08/29					<0.010	mg/kg	NC	50		
9567772	Aroclor 1016	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1221	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1232	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1242	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1248	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1254	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1260	2019/08/30	100	50 - 130	107	50 - 130	<0.010	mg/kg	NC	50		
9567772	Aroclor 1262	2019/08/30					<0.010	mg/kg	NC	50		
9567772	Aroclor 1268	2019/08/30					<0.010	mg/kg	NC	50		
9568080	Total Arsenic (As)	2019/08/29	102	75 - 125	97	80 - 120	<1.0	mg/kg	1.8	30	108	53 - 147
9568080	Total Cadmium (Cd)	2019/08/29	99	75 - 125	94	80 - 120	<0.050	mg/kg	9.4	30	112	72 - 128
9568080	Total Chromium (Cr)	2019/08/29	107	75 - 125	100	80 - 120	<1.0	mg/kg	7.9	30	87	59 - 141
9568080	Total Cobalt (Co)	2019/08/29	100	75 - 125	99	80 - 120	<0.50	mg/kg	3.3	30	100	58 - 142
9568080	Total Copper (Cu)	2019/08/29	96	75 - 125	99	80 - 120	<1.0	mg/kg	1.2	30	110	83 - 117
9568080	Total Lead (Pb)	2019/08/29	94	75 - 125	94	80 - 120	<0.50	mg/kg	2.5	35	116	79 - 121
9568080	Total Nickel (Ni)	2019/08/29	96	75 - 125	99	80 - 120	<1.0	mg/kg	4.4	30	110	79 - 121
9568080	Total Zinc (Zn)	2019/08/29	97	75 - 125	97	80 - 120	<10	mg/kg	3.2	30	109	79 - 121
9568101	Aroclor 1016	2019/08/30					<0.010	mg/kg	NC	50		
9568101	Aroclor 1221	2019/08/30					<0.010	mg/kg	NC	50		
9568101	Aroclor 1232	2019/08/30					<0.010	mg/kg	NC	50		
9568101	Aroclor 1242	2019/08/30					<0.010	mg/kg	NC	50		
9568101	Aroclor 1248	2019/08/30					<0.010	mg/kg	NC	50		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9568101	Aroclor 1254	2019/08/30					<0.010	mg/kg	NC	50		
9568101	Aroclor 1260	2019/08/30	62	50 - 130	85	50 - 130	<0.010	mg/kg	NC	50		
9568101	Aroclor 1262	2019/08/30					<0.010	mg/kg	NC	50		
9568101	Aroclor 1268	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1016	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1221	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1232	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1242	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1248	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1254	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1260	2019/08/30	70	50 - 130	84	50 - 130	<0.010	mg/kg	NC	50		
9569721	Aroclor 1262	2019/08/30					<0.010	mg/kg	NC	50		
9569721	Aroclor 1268	2019/08/30					<0.010	mg/kg	NC	50		
9681449	F3A (C16-C22)	2019/08/27			96	60 - 140	<50	mg/kg				
9681449	F3B (C22-C34)	2019/08/27			96	60 - 140	<50	mg/kg				

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

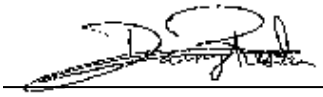
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

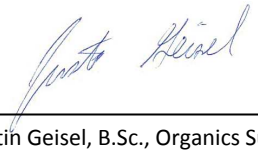
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

VALIDATION SIGNATURE PAGE

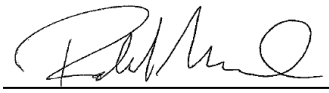
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



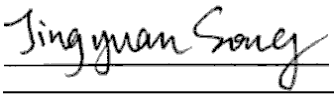
Daniel Reslan, cCT, QP, Organics Manager



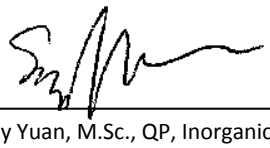
Justin Geisel, B.Sc., Organics Supervisor



Roland Menard, Analyst II



Jingyuan Song, QP, Organics – Senior Analyst



Sandy Yuan, M.Sc., QP, Inorganics Supervisor



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS "INVOICE TO"	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970514	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-02-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email	TROY.AUSTRINS@ARCADIS.COM	Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria
NOTIFY THE LAB FOR REQUIRED DLS AS PER THE ATTACHED DOCUMENT.
CONTACT P. VIRK IF THERE ARE ANY QUESTIONS REGARDING MDLS

Special Instructions
METALS: ONLY REPORT As, Cd, Cr, Co, Cu, Pb, Ni, ZINC.
PHCs: ONLY REPORT F1, F2, F3, AND F4 (i.e. NO BTEX)

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ [ ]
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCBs (Total Aroclors)	# of Bottles	Comments
1		MW-9A	19/08/16	9:40	S			X	X	X	5	
2		MW-9B	19/08/16	9:40	S			X	X	X	5	
3		MW-10A	19/08/16	10:10	S			X	X	X	5	
4		MW-10B	19/08/16	10:10	S			X	X	X	5	
5		MW-11A	19/08/16	10:30	S			X	X	X	5	Received in Yellowknife
6		MW-11B	19/08/16	10:30	S			X	X	X	5	By: [signature]
7		MW-12A	19/08/16	11:00	S			X	X	X	5	AUG 22 2019 @10:05
8		MW-12B	19/08/16	11:00	S			X	X	X	5	
9		MW-17B	19/08/16	11:30	S			X	X	X	5	Temp: ACTR
10		MW-5A	19/08/17	9:20	S			X	X	X	5	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[signature] TestAm	2019/08/23	1120		[ ]	See ACTR	[ ] Yes [ ] No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-07-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4	Total Metals	PCBs	# of Bottles	Comments
1		MW-5B	19/08/17	9:20	S			X	X	X	5	
2		MW-6A	19/08/17	9:40	S			X	X	X	5	
3		MW-6B	19/08/17	9:40	S			X	X	X	5	
4		MW-7A	19/08/17	10:00	S			X	X	X	5	
5		MW-7B	19/08/17	10:00	S			X	X	X	5	
6		MW-8A	19/08/17	10:20	S			X	X	X	5	
7		MW-8B	19/08/17	10:20	S			X	X	X	5	
8		P3-1A	19/08/17	18:40	S			X	X	X	5	
9		P3-1B	19/08/17	18:40	S			X	X	X	5	
10		P3-2A	19/08/17	17:40	S			X	X	X	5	

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ *(call lab for #)*

Received in Yellowknife
By: [signature]
AUG 22 2019 @ 16:05
Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	TCSt Ali	2019/08/23	1120				Yes / No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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White: BV Labs Yellow: Client

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-08-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4	TOTAL METALS	PCBs	# of Bottles	Comments
1		P3-2B	19/08/17	17:40	S			X	X	X	5	
2		P3-3A	19/08/17	18:00	S			X	X	X	5	
3		P3-3B	19/08/17	18:00	S			X	X	X	5	
4		P3-4A	19/08/17	18:20	S			X	X	X	5	
5		P3-4B	19/08/17	18:20	S			X	X	X	5	Received in Yellowknife
6		~~P3~~ MW-13A	19/08/18	10:10	S			X	X	X	5	By:
7		MW-13B	19/08/18	10:10	S			X	X	X	5	AUG 22 2019 @ 10:05
8		MW-14A	19/08/18	11:10	S			X	X	X	5	
9		MW-14B	19/08/18	11:10	S			X	X	X	5	Temp: ACTR
10		MW-15A	19/08/18	12:20	S			X	X	X	5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
~~ELLIOTT~~ ELLIOTT HOLDEN	19/08/20	10:00	Tashia	2019/08/23	1120	

Lab Use Only: Time Sensitive ☐ | Temperature (ºC) on Receipt: See ACTR | Custody Seal Intact on Cooler? ☐ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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4000 19st N.E. Calgary. Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-09-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Analysis Requested: F1 - F4	METALS	PCBS	# of Bottles	Comments
1		MW - 15 B	19/08/18	12:20	S			X	X	X	5	
2		MW - 16 A	19/08/18	9:10	S			X	X	X	5	
3		MW - 16 B	19/08/18	9:10	S			X	X	X	5	
4		MW - 18 B	19/08/18	10:30	S			X	X	X	5	
5		MW - 19 B	19/08/18	11:30	S			X	X	X	5	Received in Yellowknife
6		P3 - 5 A	19/08/18	18:10	S			X	X	X	5	By:
7		P3 - 5 B	19/08/18	18:10	S			X	X	X	5	AUG 22 2019 @ 10:05
8		P3 - 6 A	19/08/18	17:00	S			X	X	X	5	
9		P3 - 6 B	19/08/18	17:00	S			X	X	X	5	Temp: ALTR
10		P3 - 7 A	19/08/18	17:20	S			X	X	X	5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
ELLIOTT HOLDEN	19/08/20	10:00	TESHALI	2019/08/23	1120	

Lab Use Only: Time Sensitive ☐ | Temperature (°C) on Receipt | Custody Seal Intact on Cooler? ☐ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-10-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1-F4	METALS	PCBS	# of Bottles	Comments
1		P3-7B	19/08/18	17:20	S			X	X	X	5	
2		P3-8A	19/08/18	17:50	S			X	X	X	5	
3		P3-8B	19/08/18	17:50	S			X	X	X	5	
4		P3-9A	19/08/18	15:20	S			X	X	X	5	
5		P3-9B	19/08/18	15:20	S			X	X	X	5	Received in Yellowknife
6		P3-10A	19/08/18	15:40	S			X	X	X	5	By: [illegible]
7		P3-10B	19/08/18	15:40	S			X	X	X	5	AUG 22 2019 @10:05
8		P3-11A	19/08/18	16:20	S			X	X	X	5	
9		P3-11B	19/08/18	16:20	S			X	X	X	5	Temp: ACTR
10		P3-19B	19/08/18	16:40	S			X	X	X	5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒

(will be applied if Rush TAT is not specified)

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Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) ☐

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[illegible]	2019/08/22	1120		☐	SEE ATR	☐ Yes ☐ No

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White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	BG0371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201	Address		Project #	30000251	Chain Of Custody Record	Project Manager
	Ottawa ON K2H 8K7			Project Name		C#591564-11-01	Parminder Virk
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Site #	PIN-3		
Email	Jacob.Holden@arcadis.com	Email		Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	F1 - F4	METALS	PCBs	# of Bottles	Comments
1		P3 -12 A	19/08/18	20:20	S			X	X	X	5	
2		P3 - 12 B	19/08/18	20:20	S			X	X	X	5	
3		P3 - 13 A	19/08/18	20:40	S			X	X	X	5	
4		P3 - 13 B	19/08/18	20:40	S			X	X	X	5	
5		P3 - 14 A	19/08/18	20:00	S			X	X	X	5	TIME SAMPLED 21:00
6		P3 - 14 B	19/08/18	21:00	S			X	X	X	5	
7		P3 - 15 A	19/08/18	21:20	S			X	X	X	5	
8		P3 - 15 B	19/08/18	21:20	S			X	X	X	5	
9		P3 - 16 A	19/08/18	21:40	S			X	X	X	5	
10		P3 - 16 B	19/08/18	21:40	S			X	X	X	5	

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
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Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____
(call lab for #)

Received in Yellowknife
By: Sam Brown
AUG 22 2019 @10:05
Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	TESHALI	2019/08/23	1120		☐	SEE ACTR	☐ Yes ☐ No

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-12-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	F1 - F4	METALS	PCBs							# of Bottles	Comments
1		P3 - 17A	19/08/18	21:00	S			X	X	X							5	
2		P3 - 18A	19/08/18	22:00	S			X	X	X							5	
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ [ ]
Rush Confirmation Number _____ *(call lab for #)*

Received in Yellowknife
By: [illegible]
AUG 22 2019 @ 10:05
Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[illegible]	2019/08/23	1120		[ ]	See ACTR	[ ] Yes [ ] No

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White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

H

Holden, Elliott reported via email, 2 days ago (Mon, 18 Nov 2019 at 3:06 PM)

to: "Parminder Virk" <parminder.virk@bvlabs.com>

cc: troy.austrins@arcadis.com

Hi Parminder,

I am trying to determine if the PHC F3 results in some of the soil samples that fall under BV Lab's Job#: B970574 are due to natural BOCs.

I was wondering if it would be possible to get chromatogram specifically focused in on the F3 range and/or sub-fraction concentrations for F3a and F3b (i.e., percentage of total F3 range that falls within the F3b or F3a range) for the following five samples:

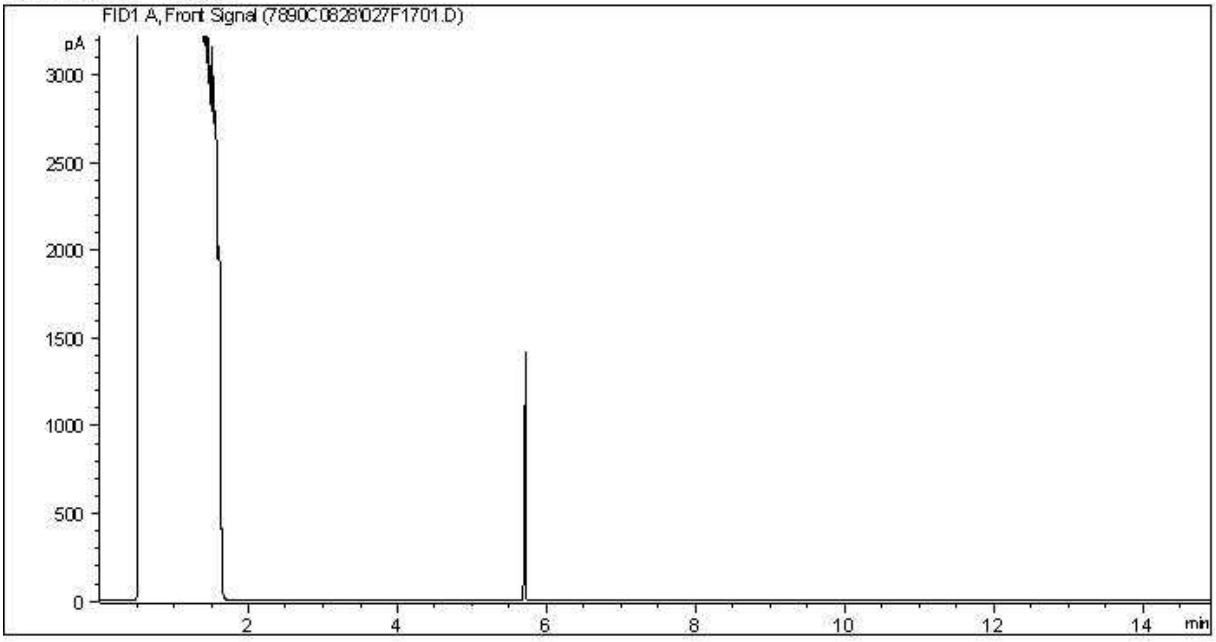
P3-11A
MW-11A
P3-14A
P3-16A
P3-18A

Regards,

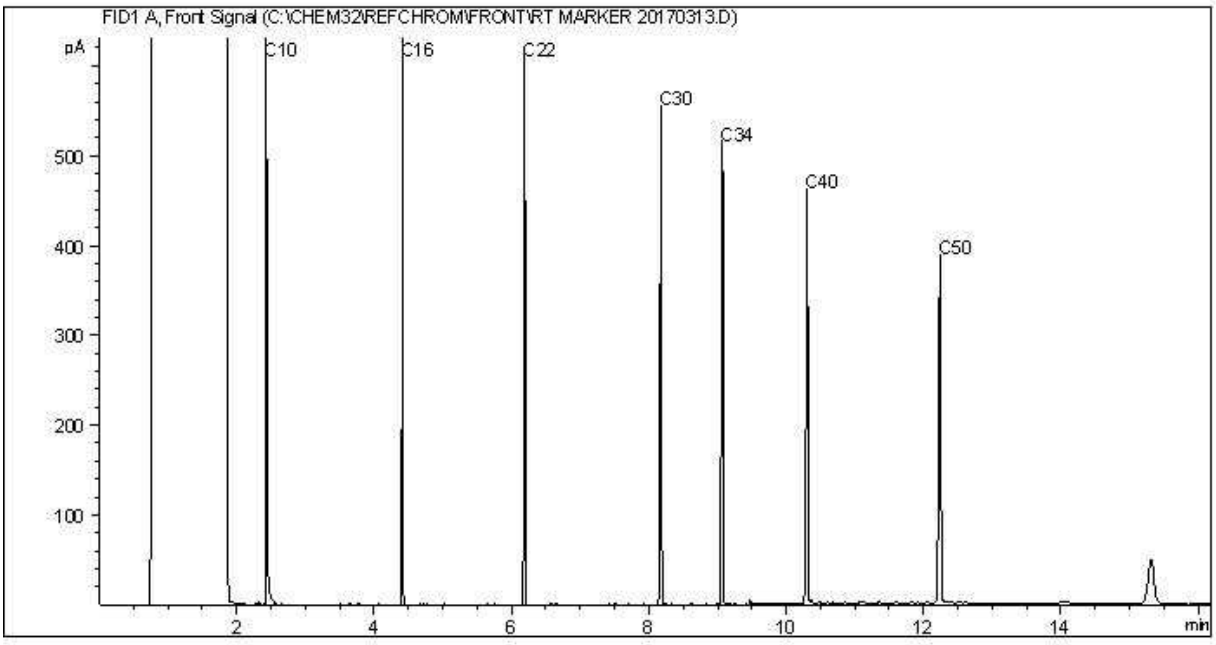
-Elliott

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



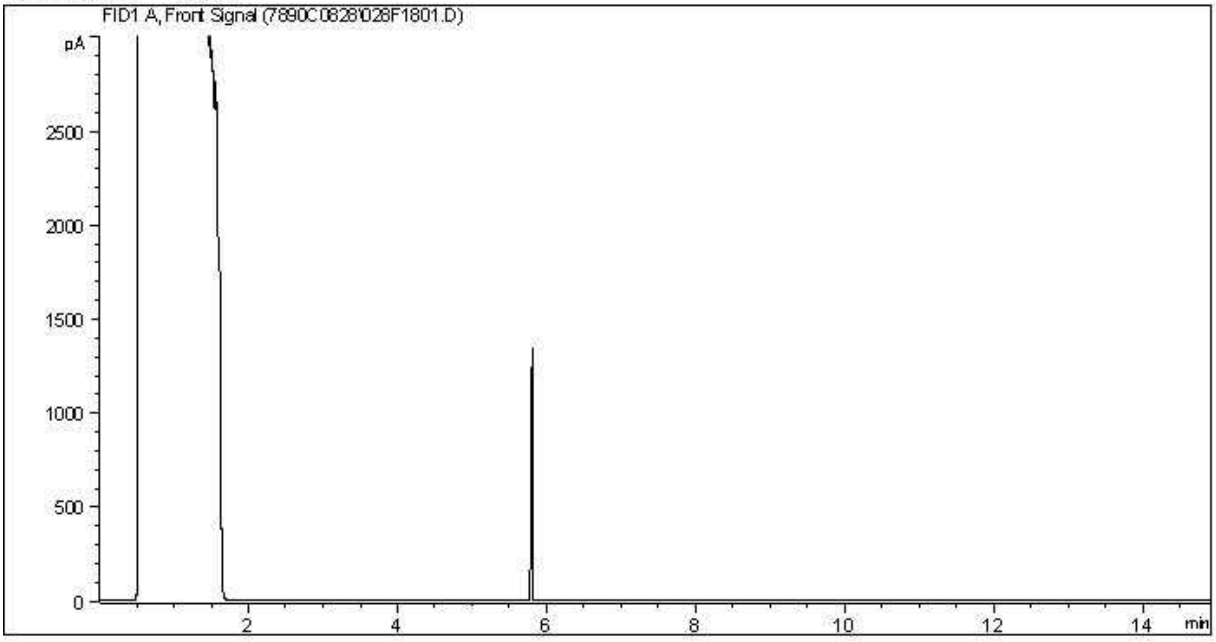
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

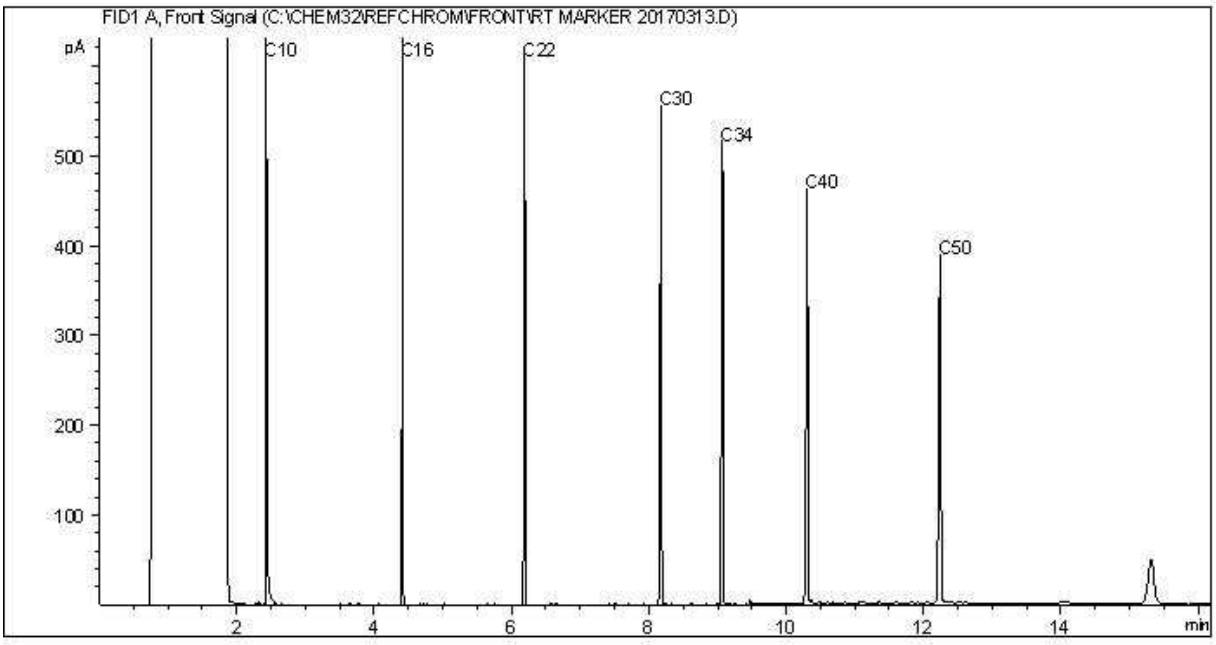
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



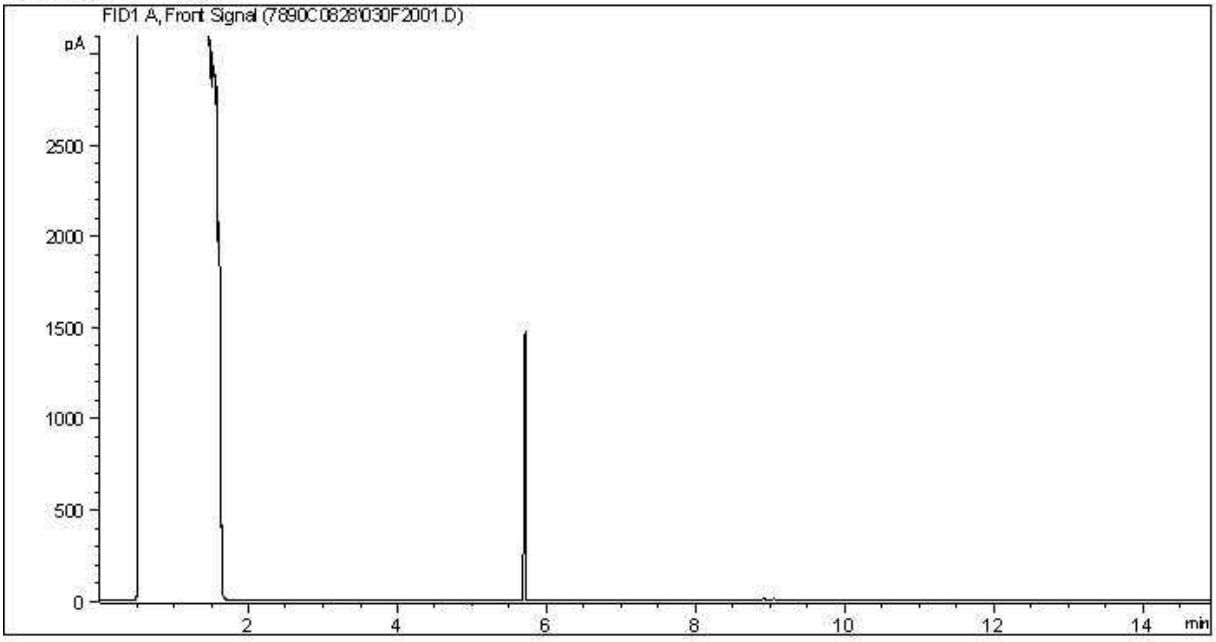
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

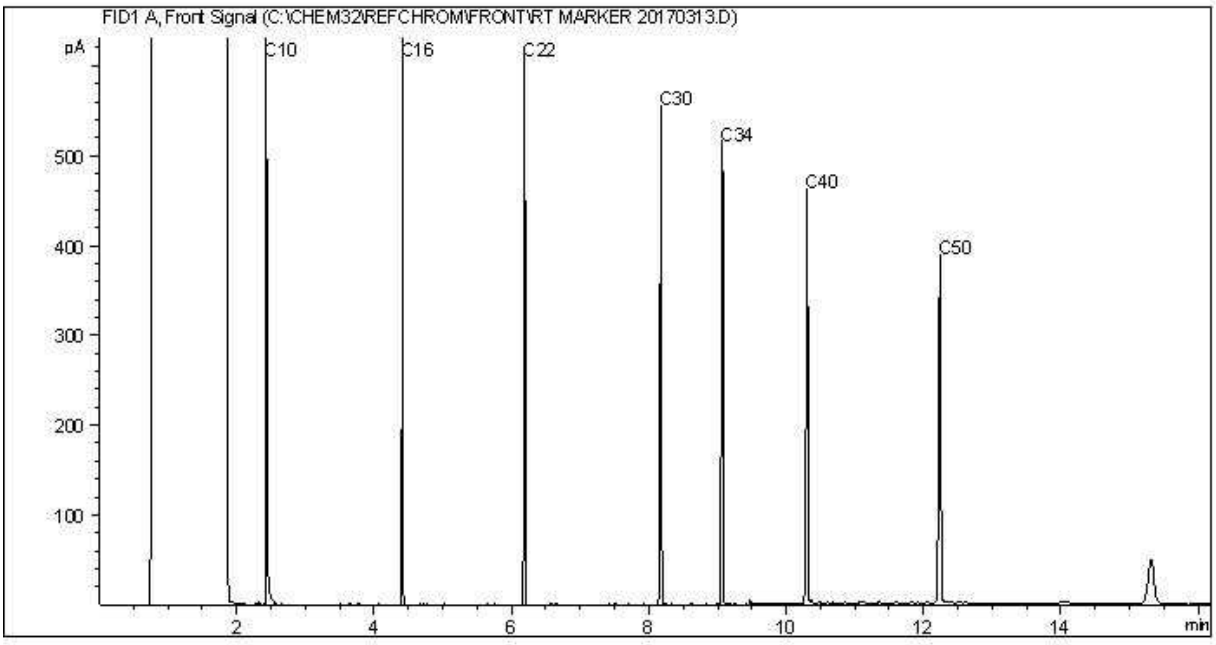
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



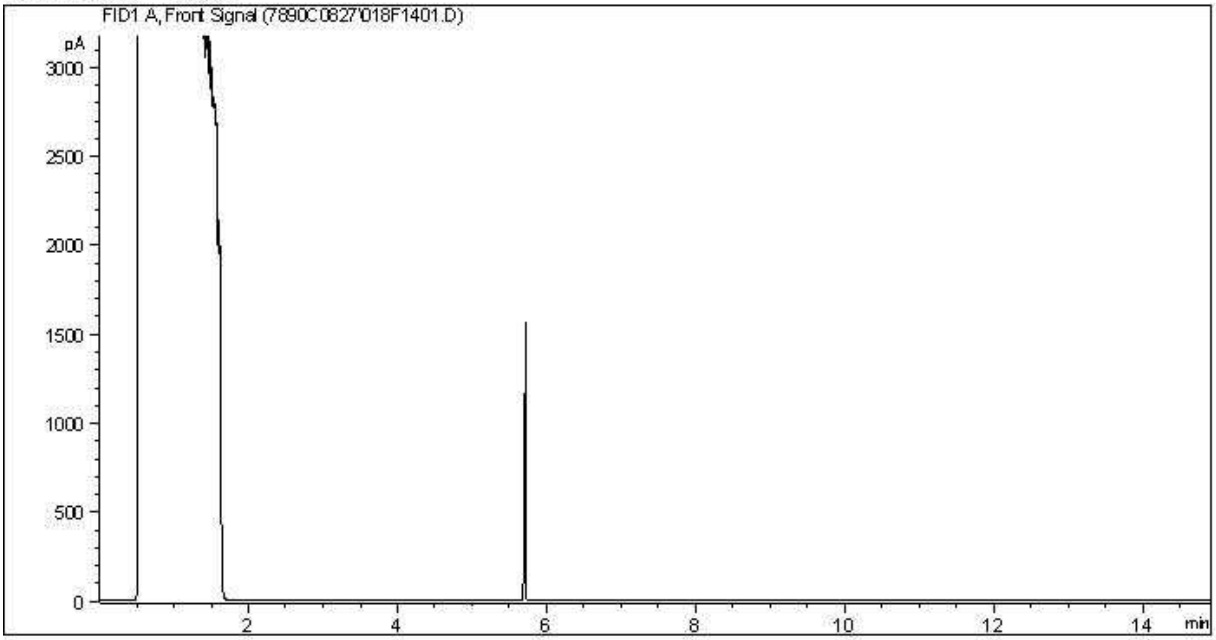
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

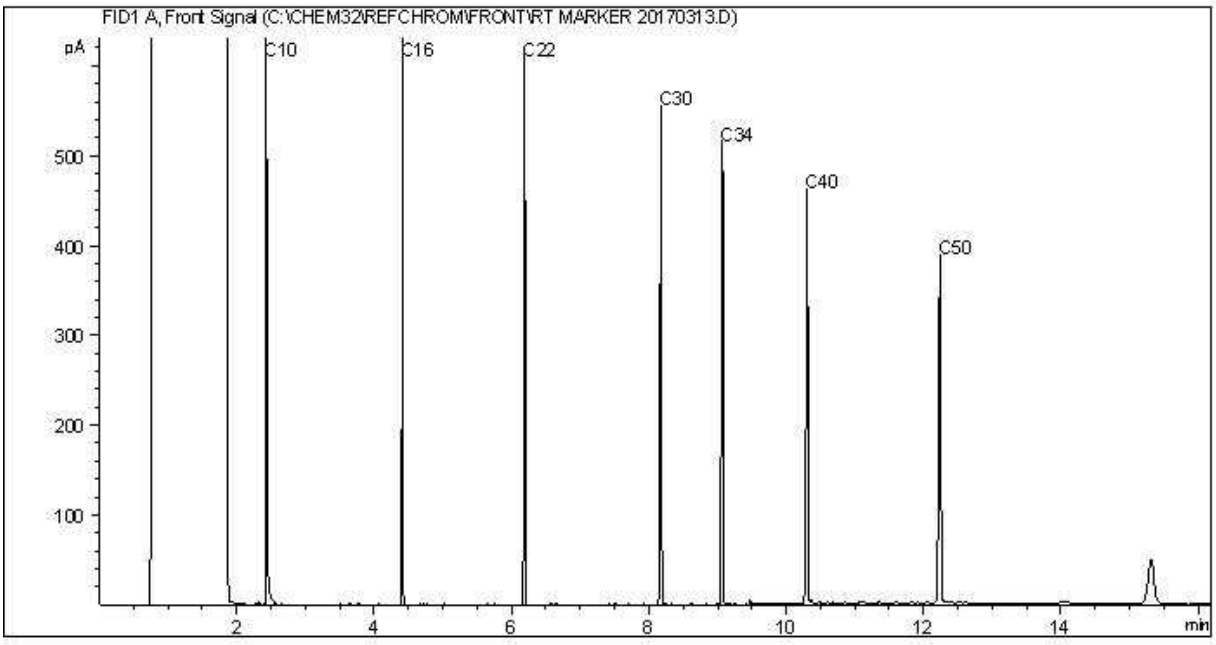
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



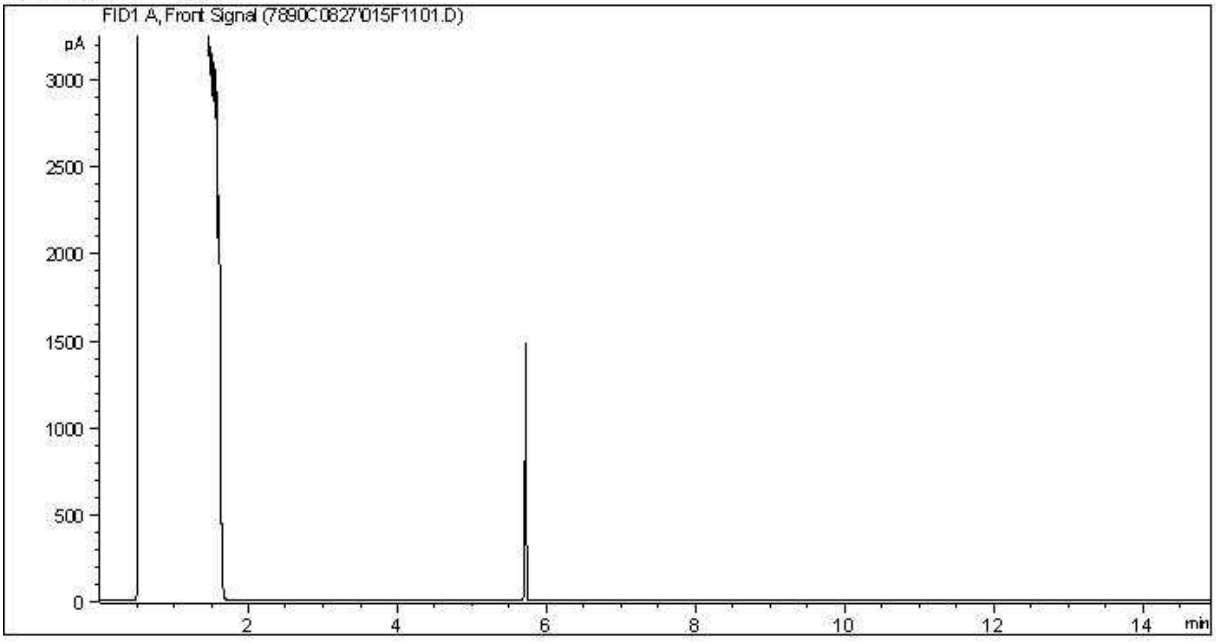
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

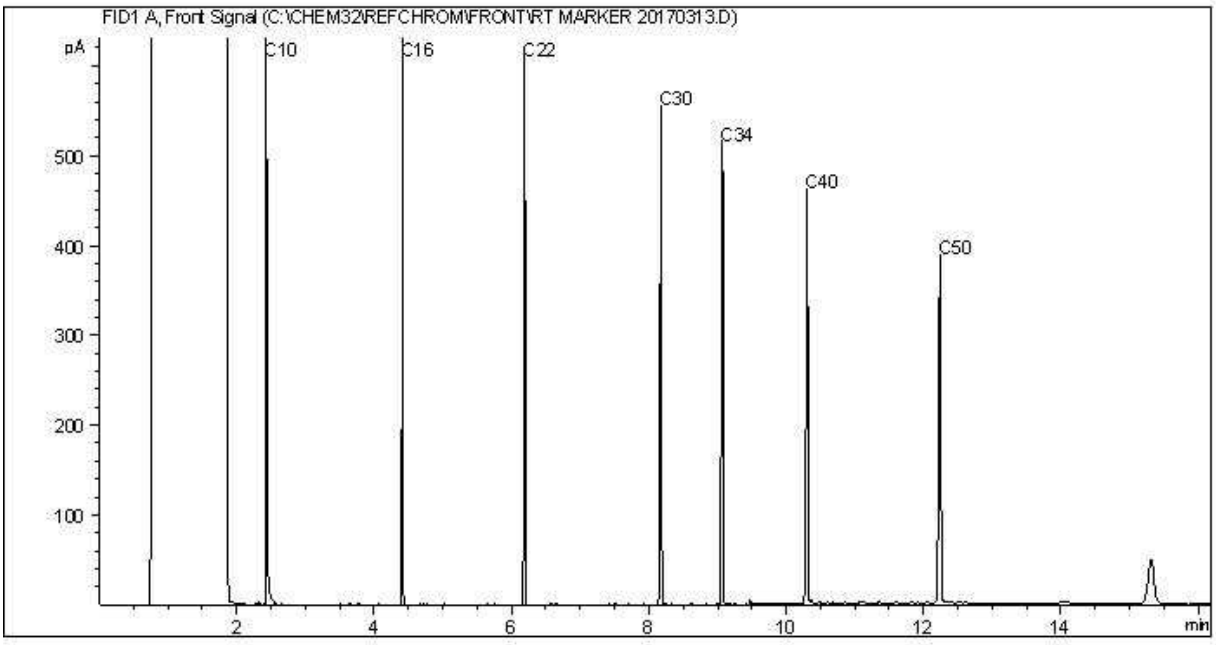
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



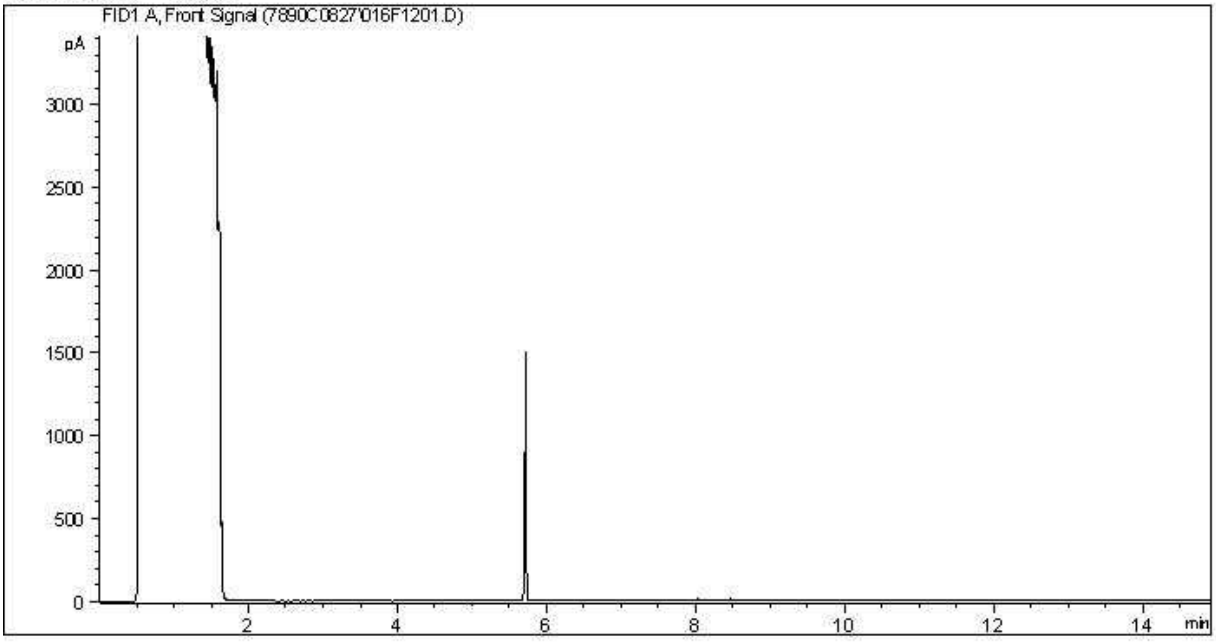
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

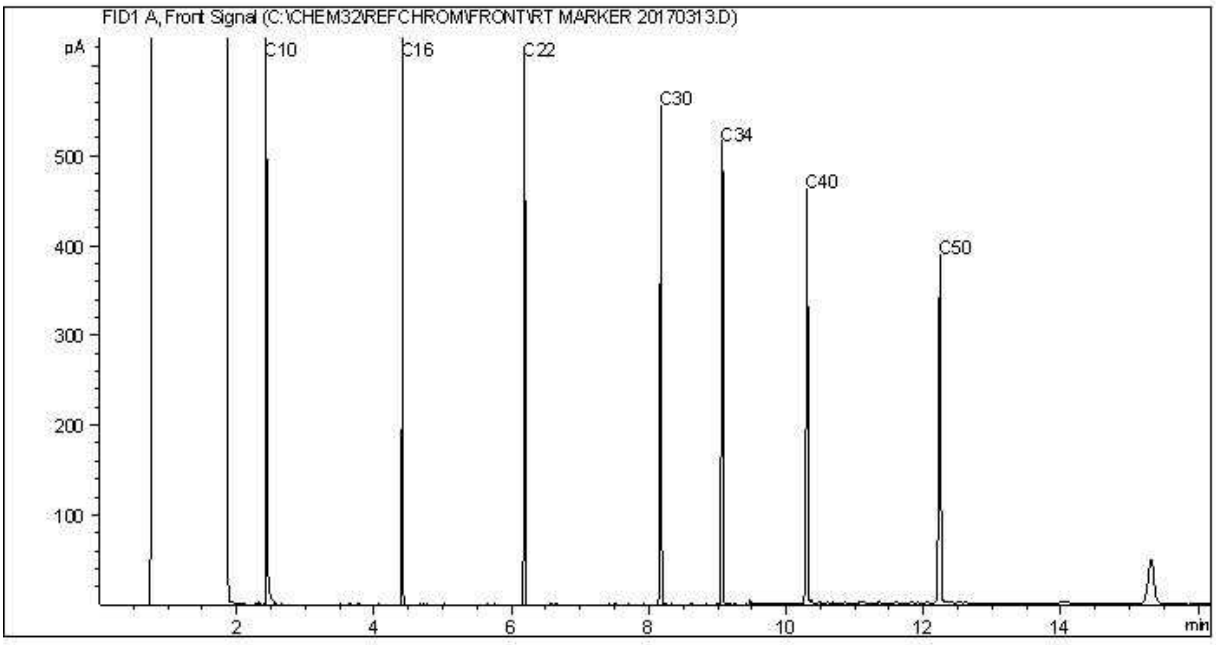
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



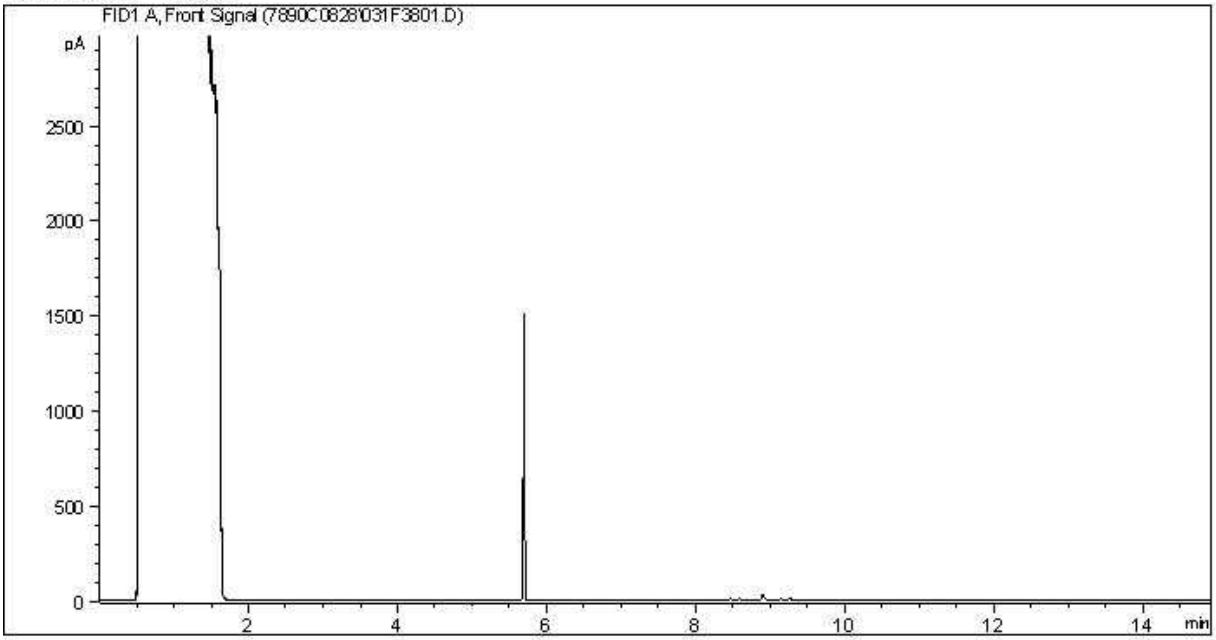
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

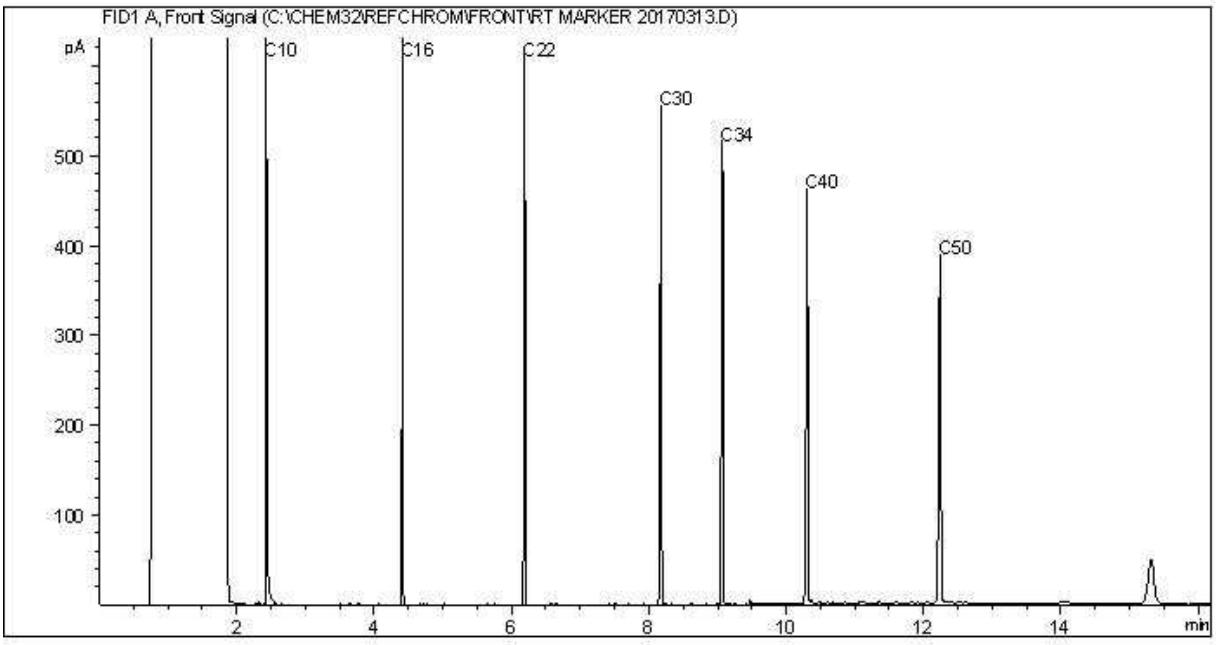
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



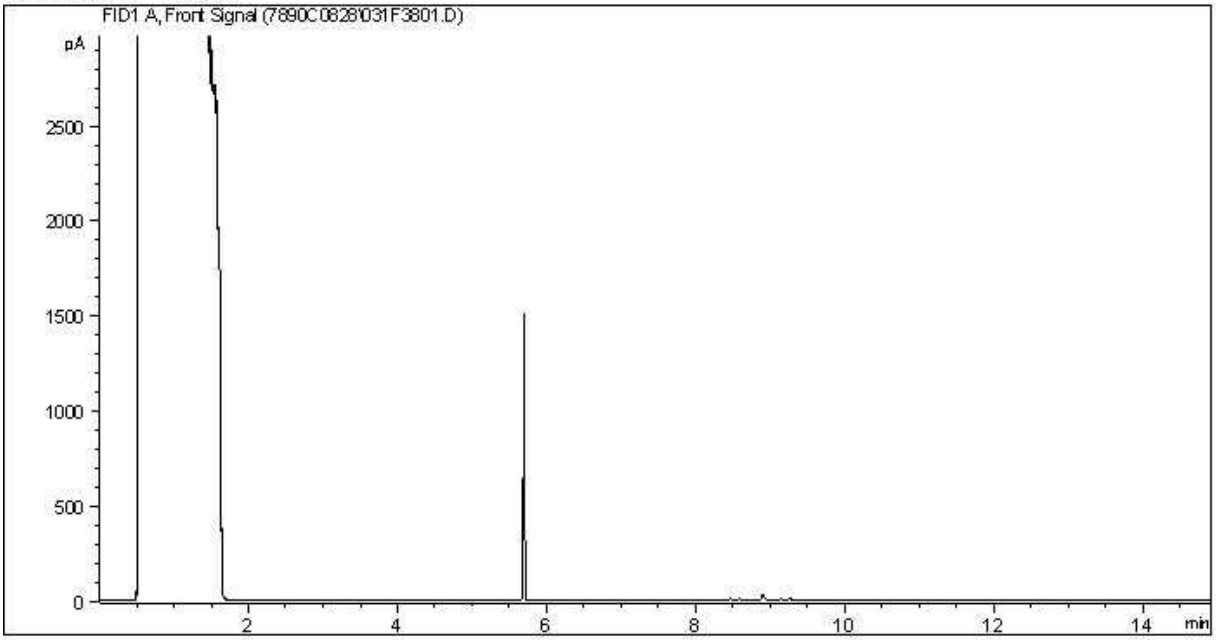
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

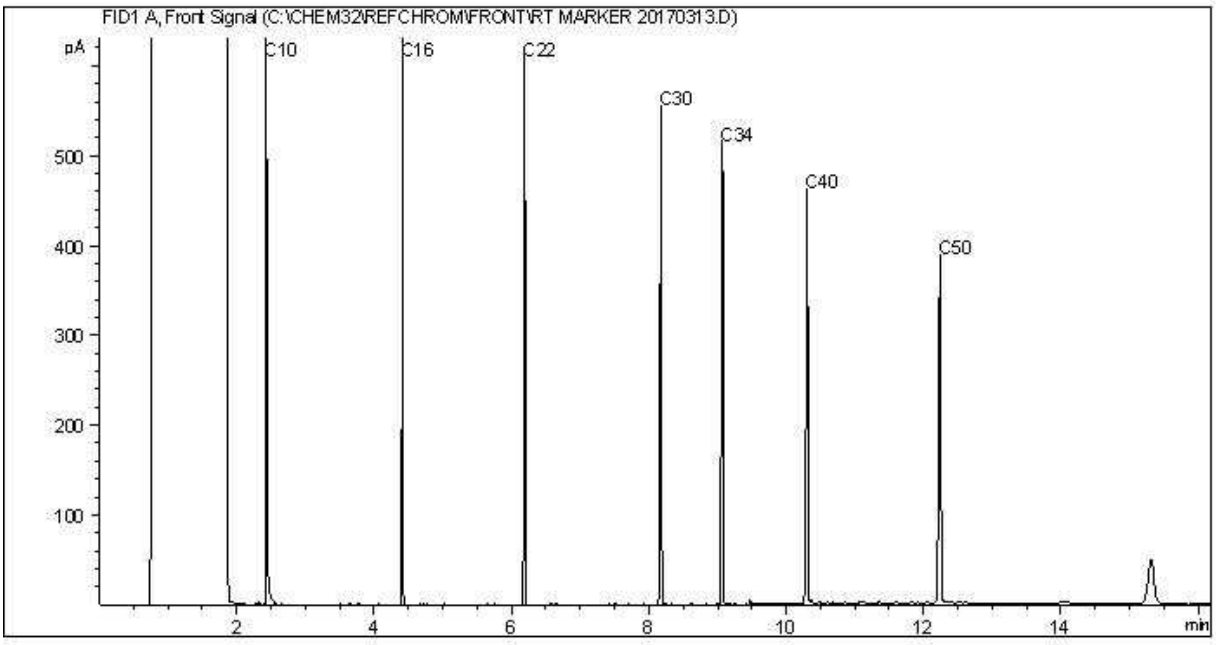
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4)+F3A/B in soil Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



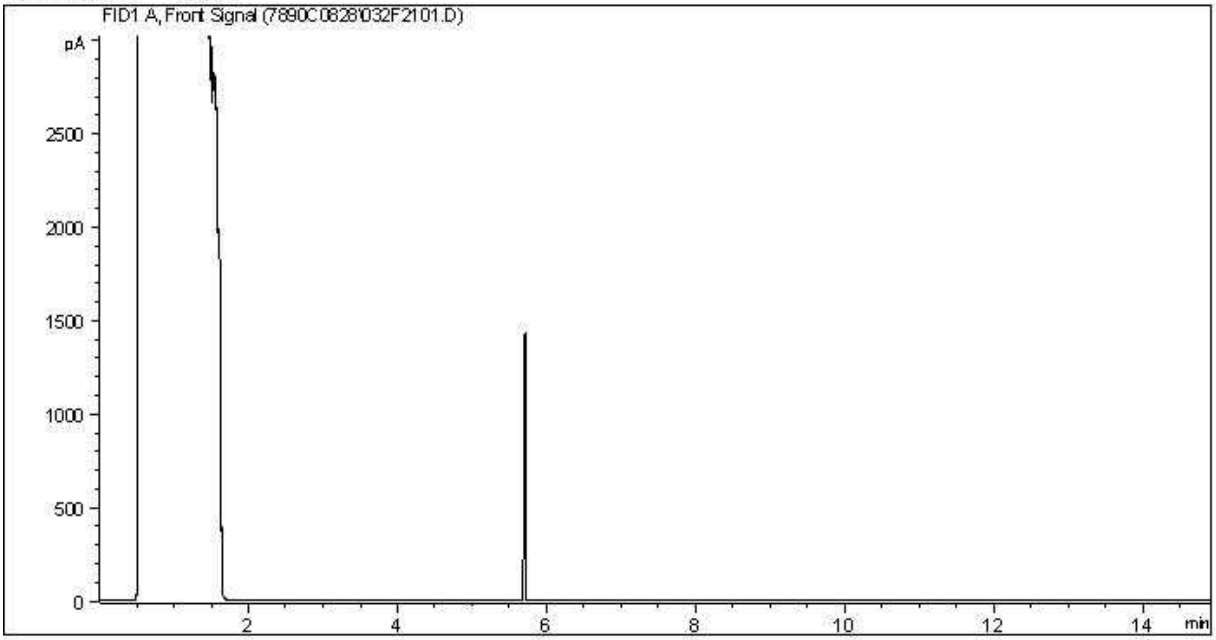
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

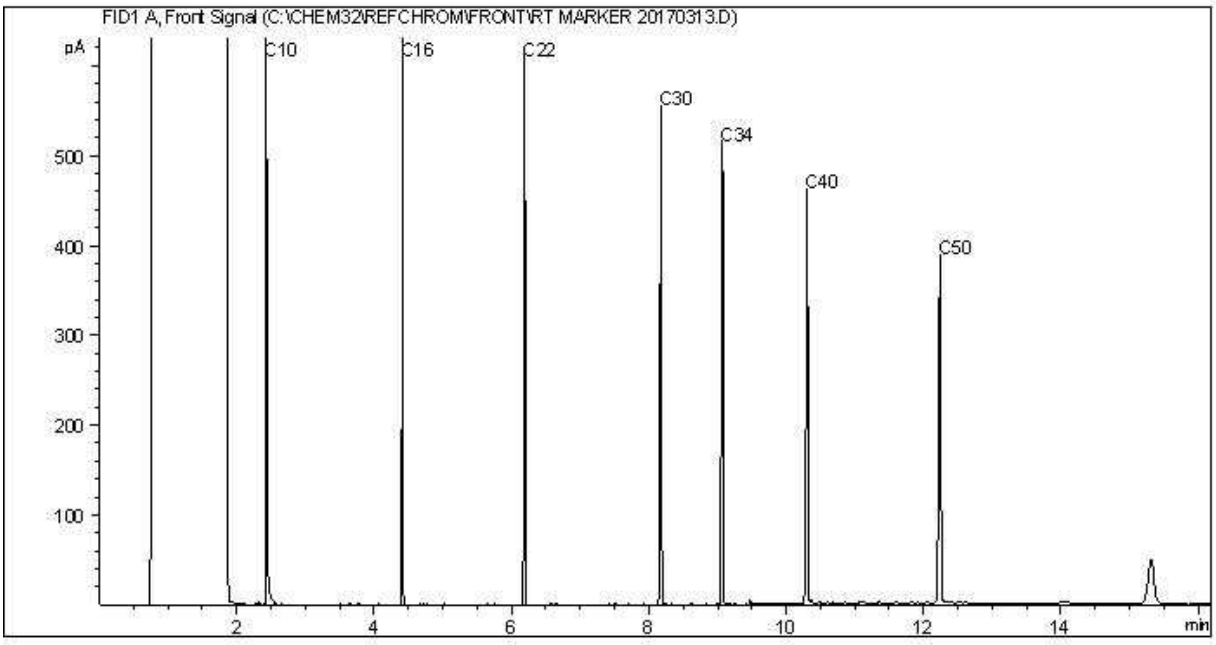
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



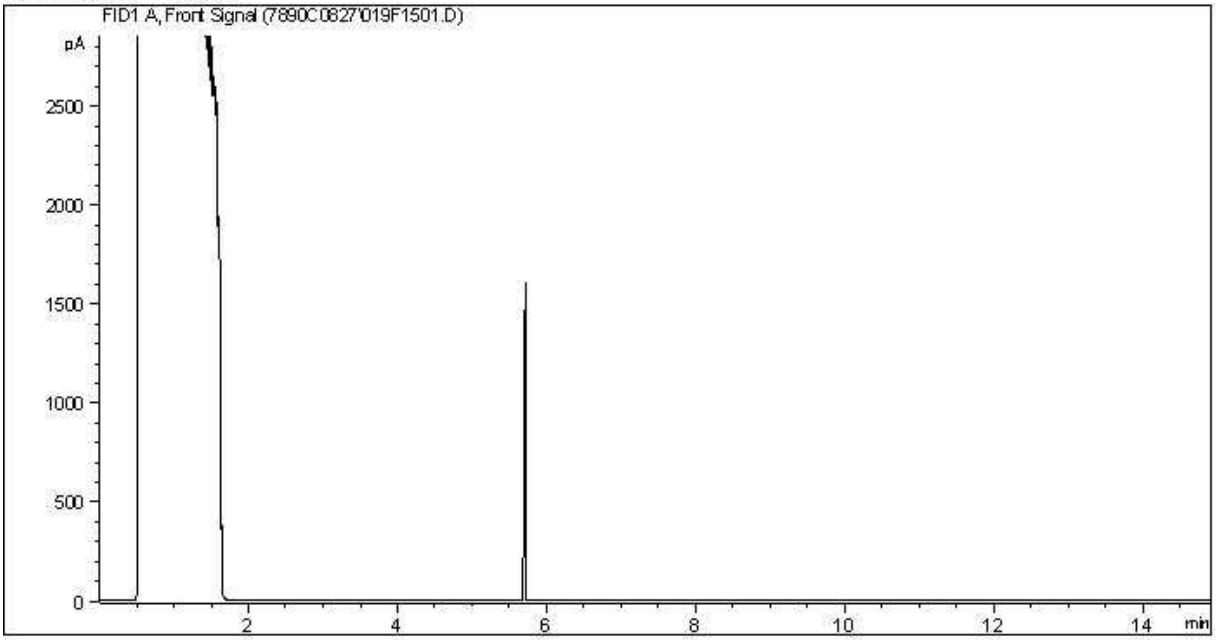
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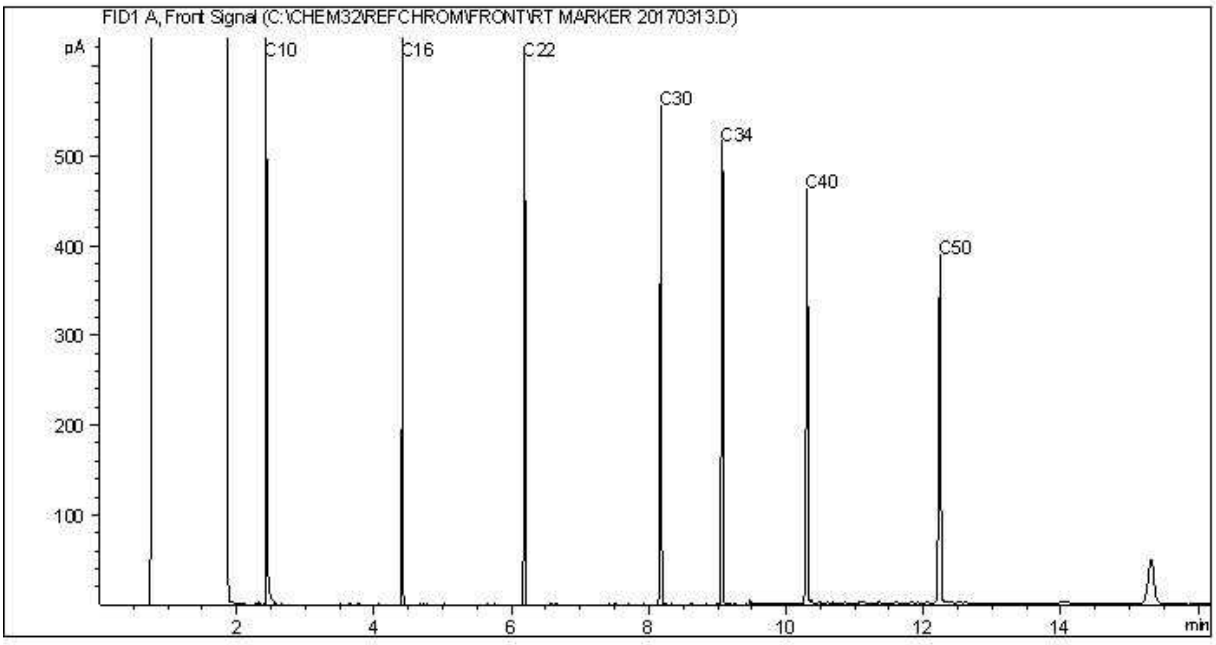
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



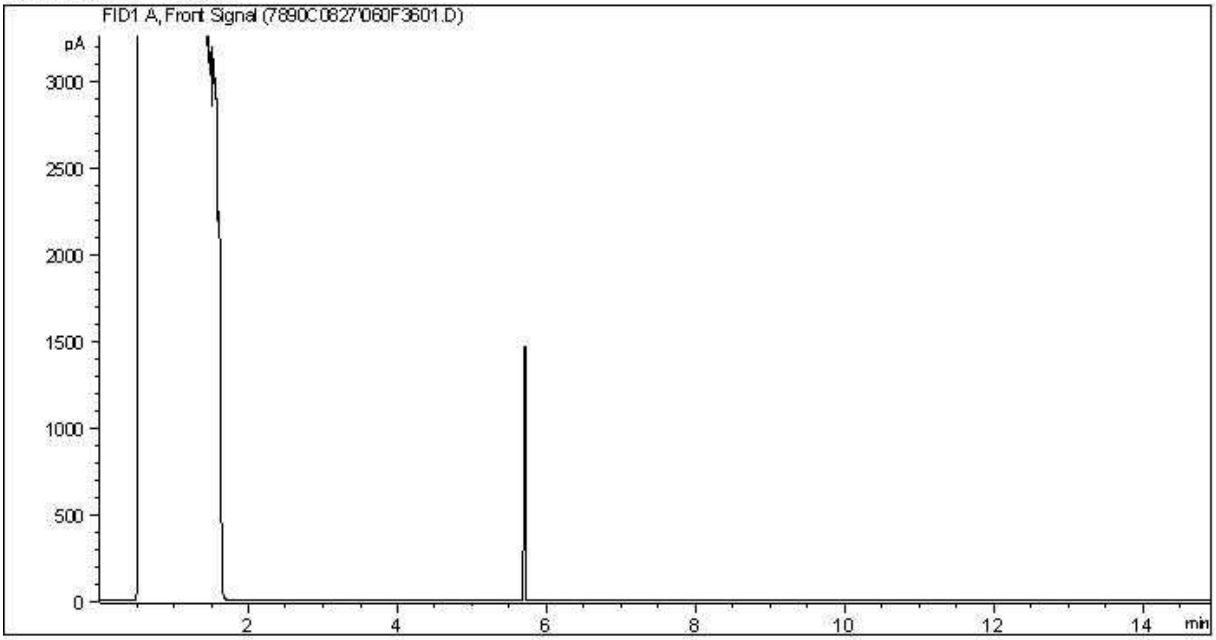
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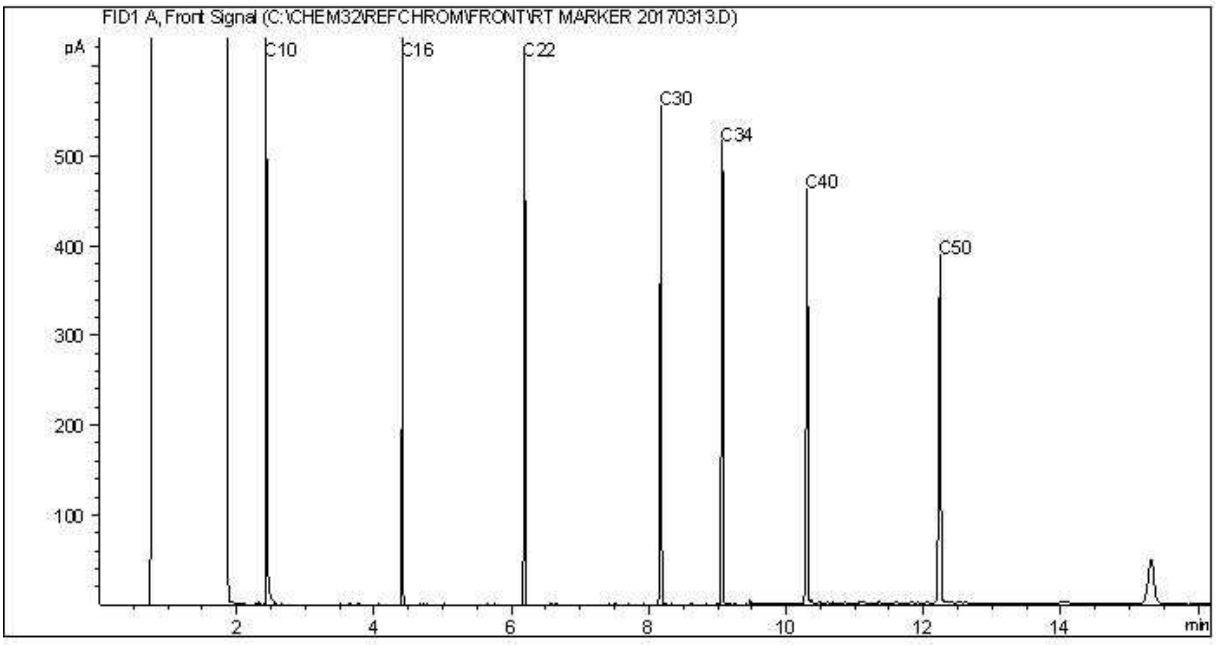
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



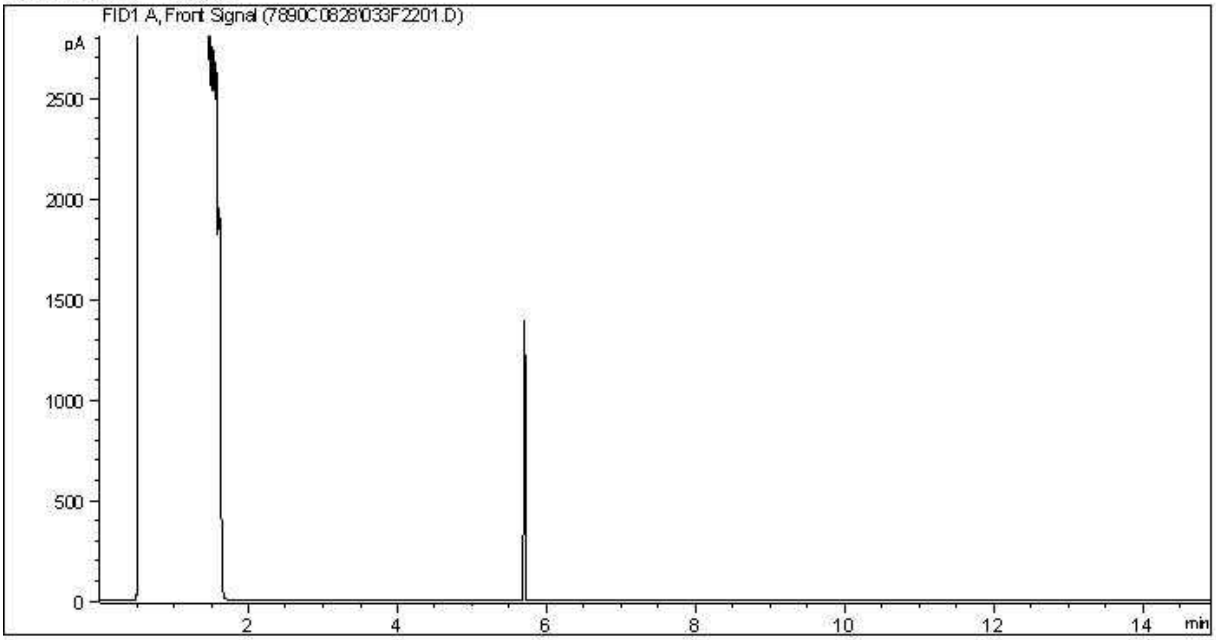
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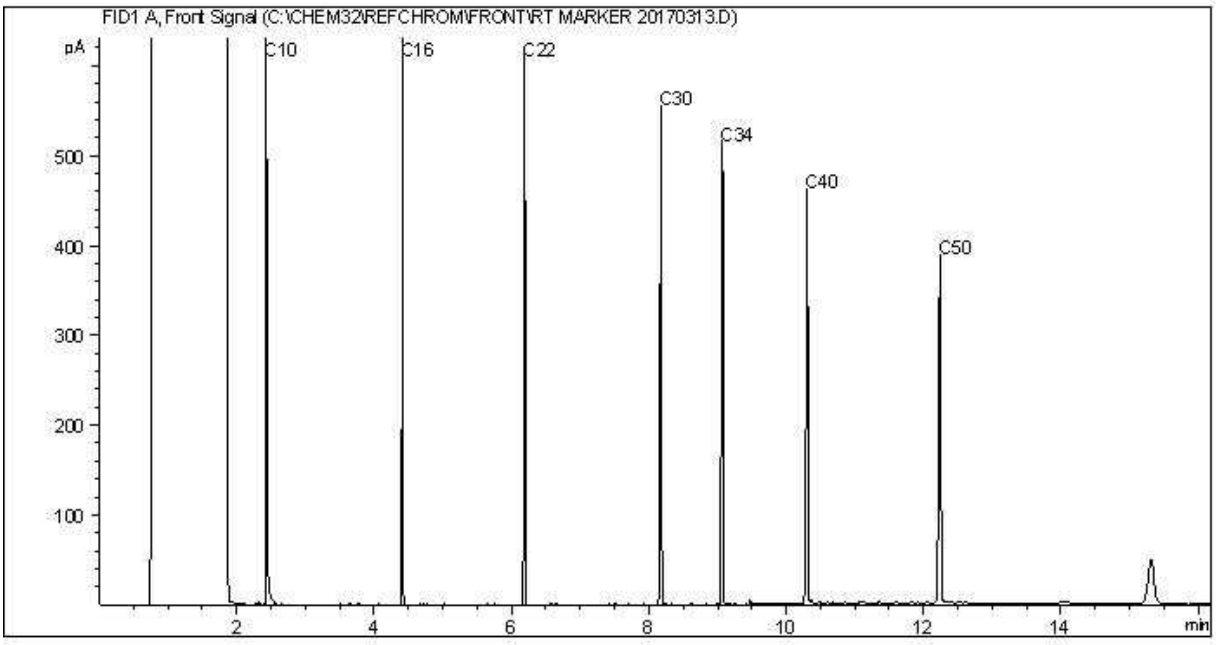
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



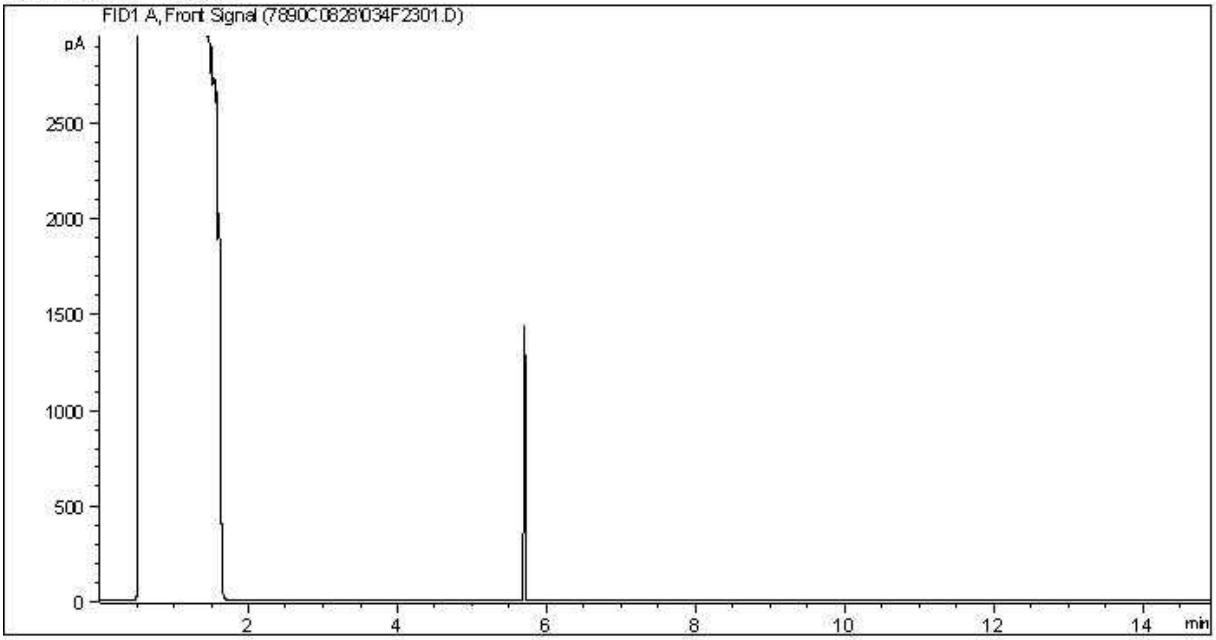
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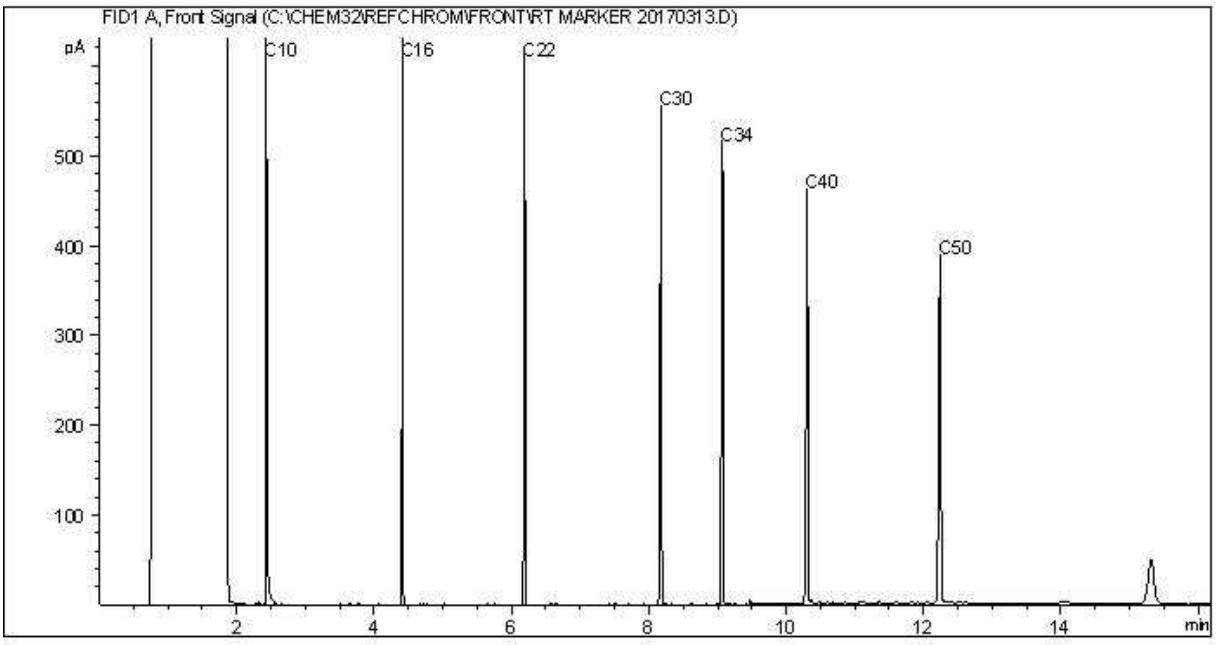
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



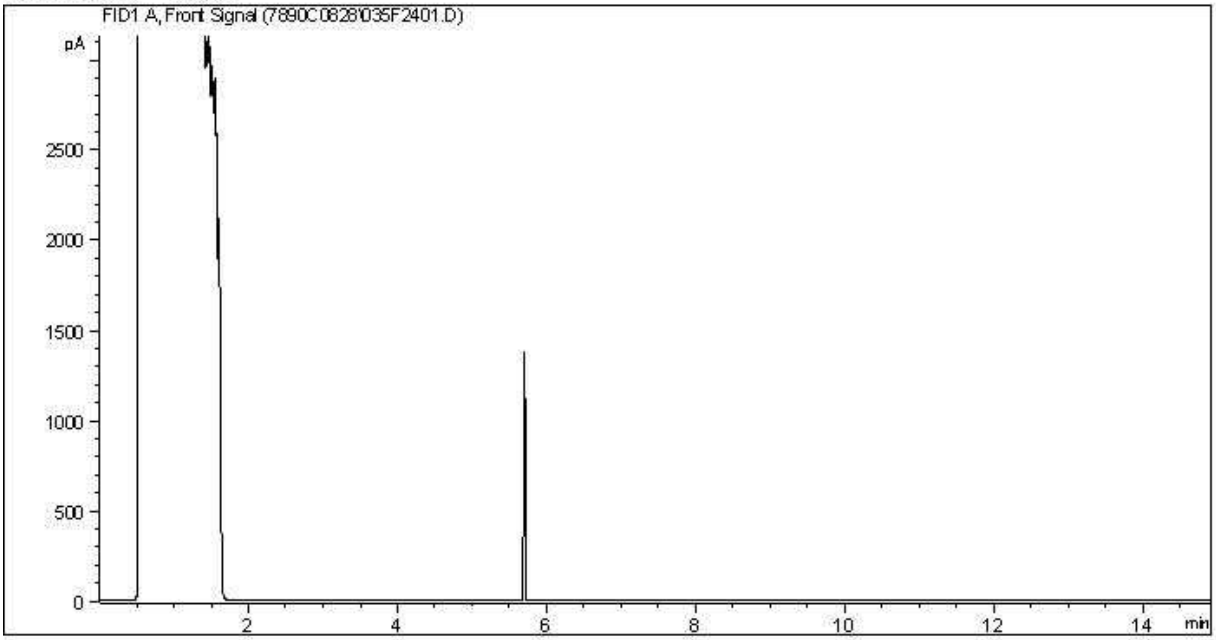
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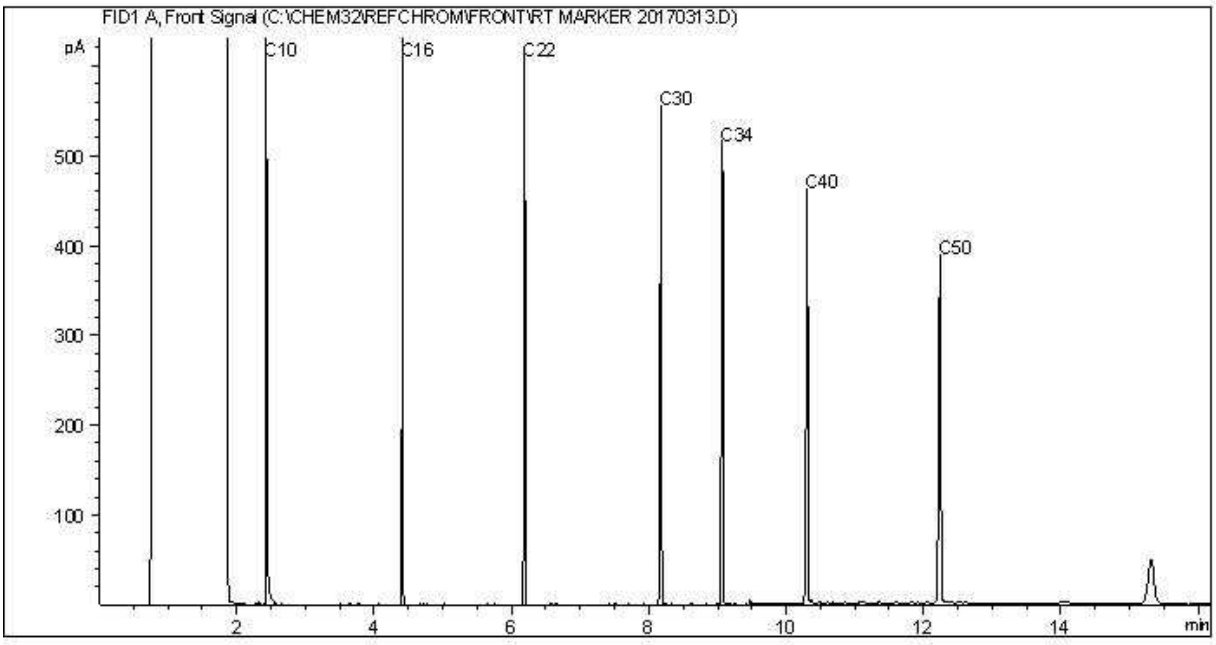
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Carbon Range Distribution - Reference Chromatogram



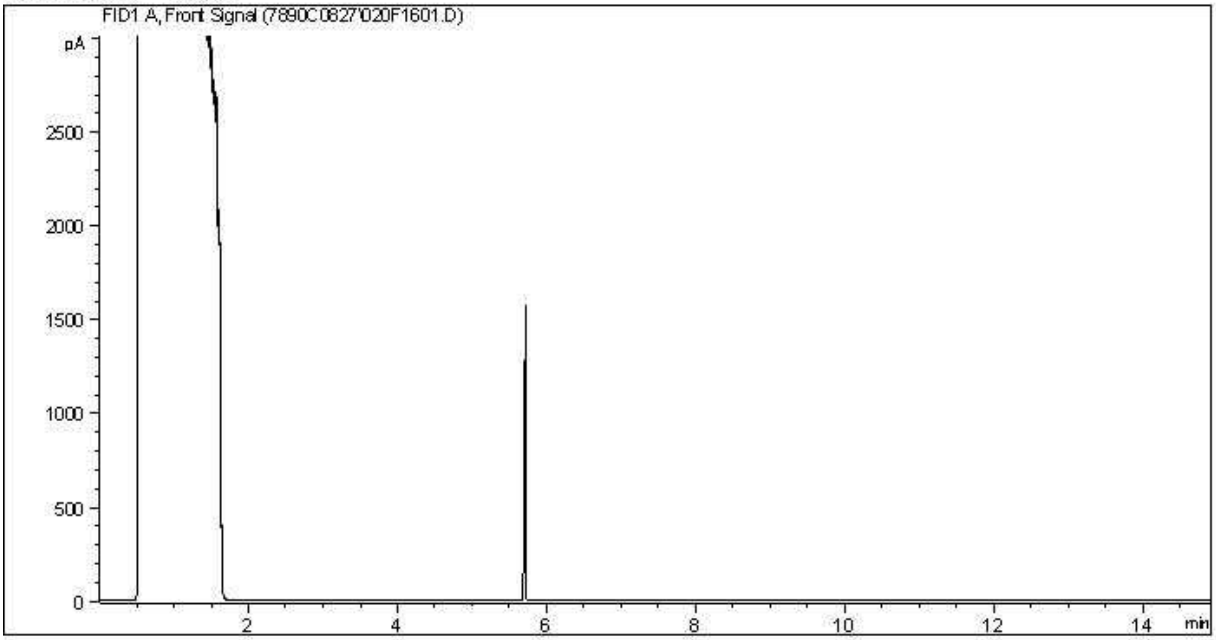
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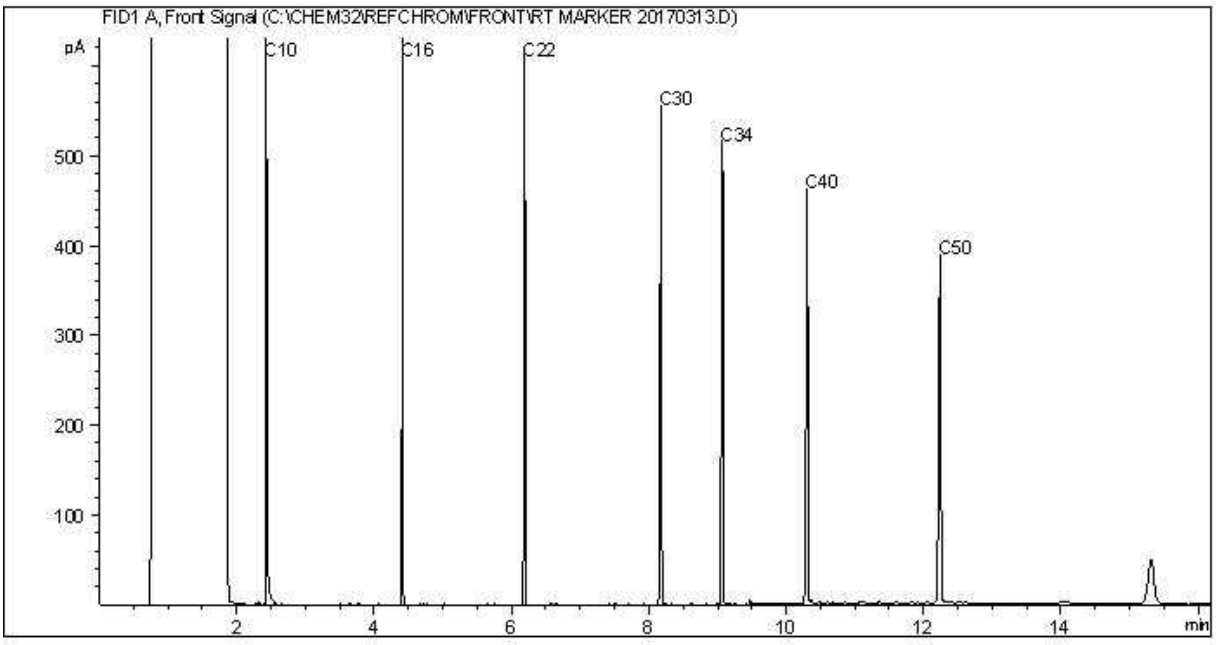
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



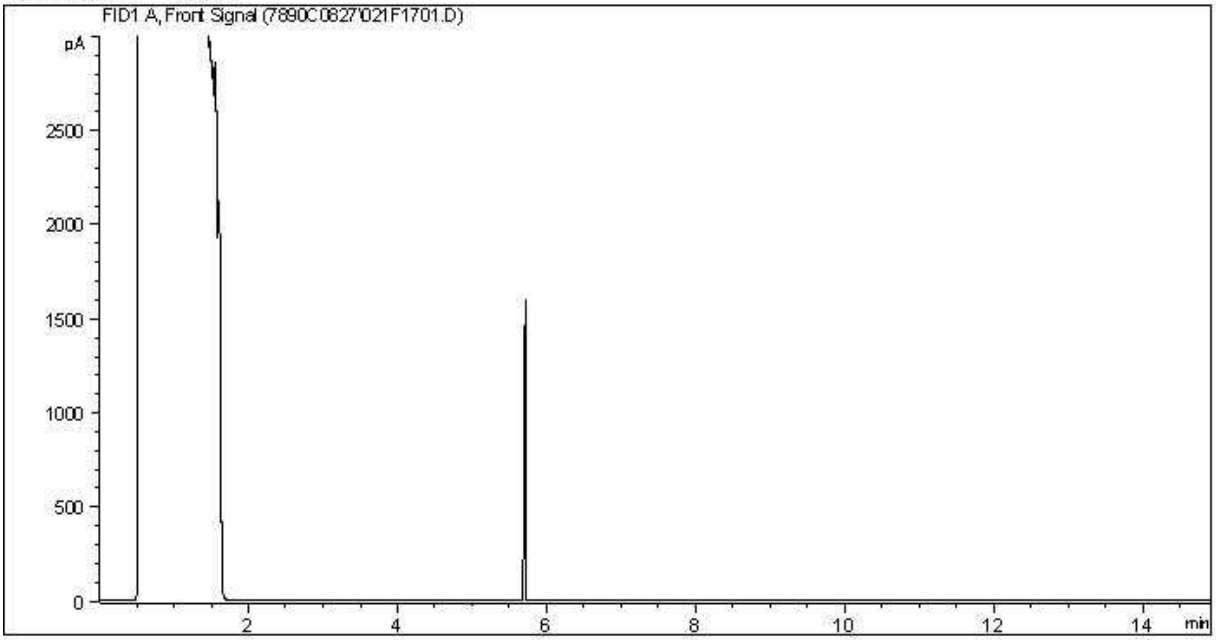
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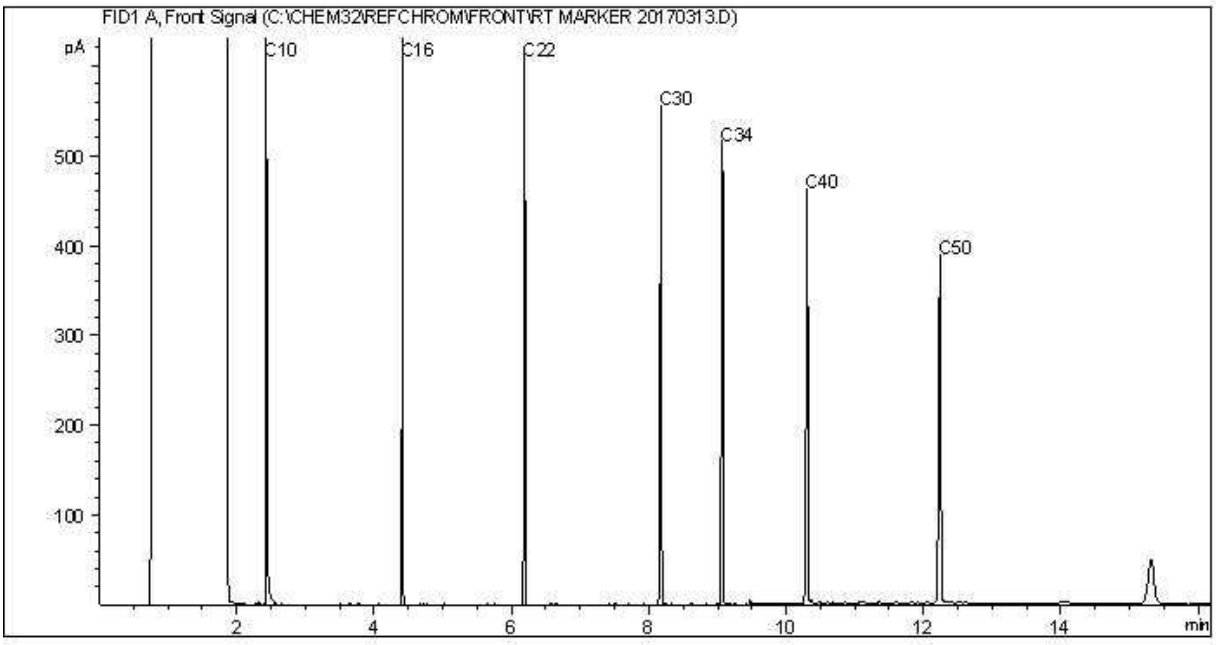
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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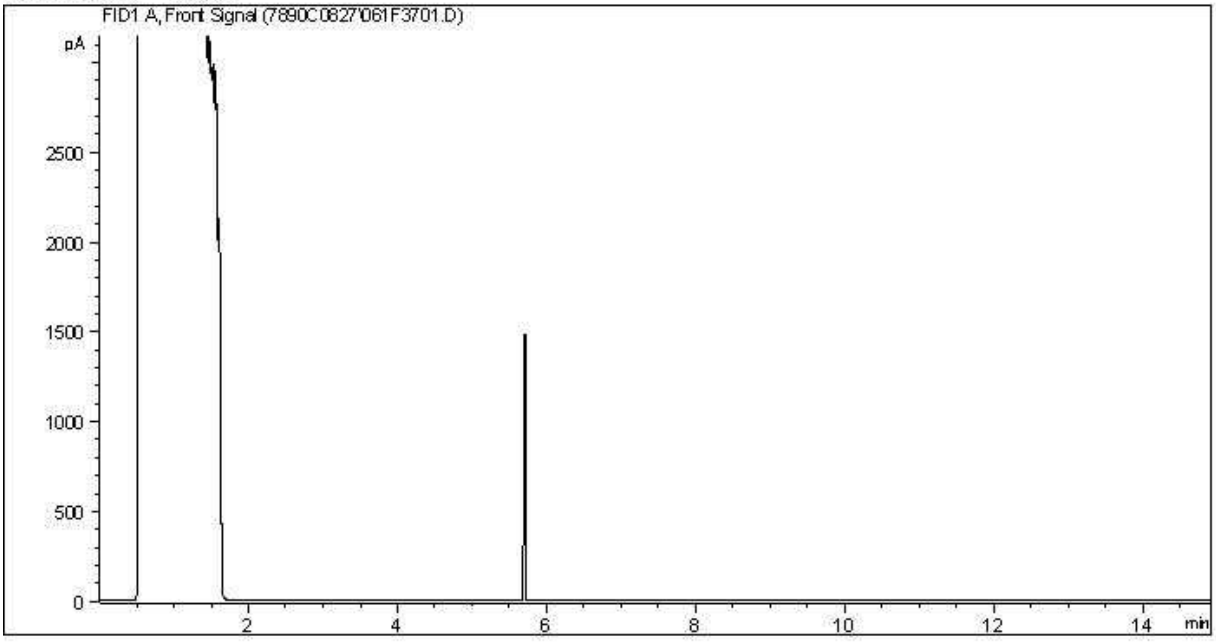
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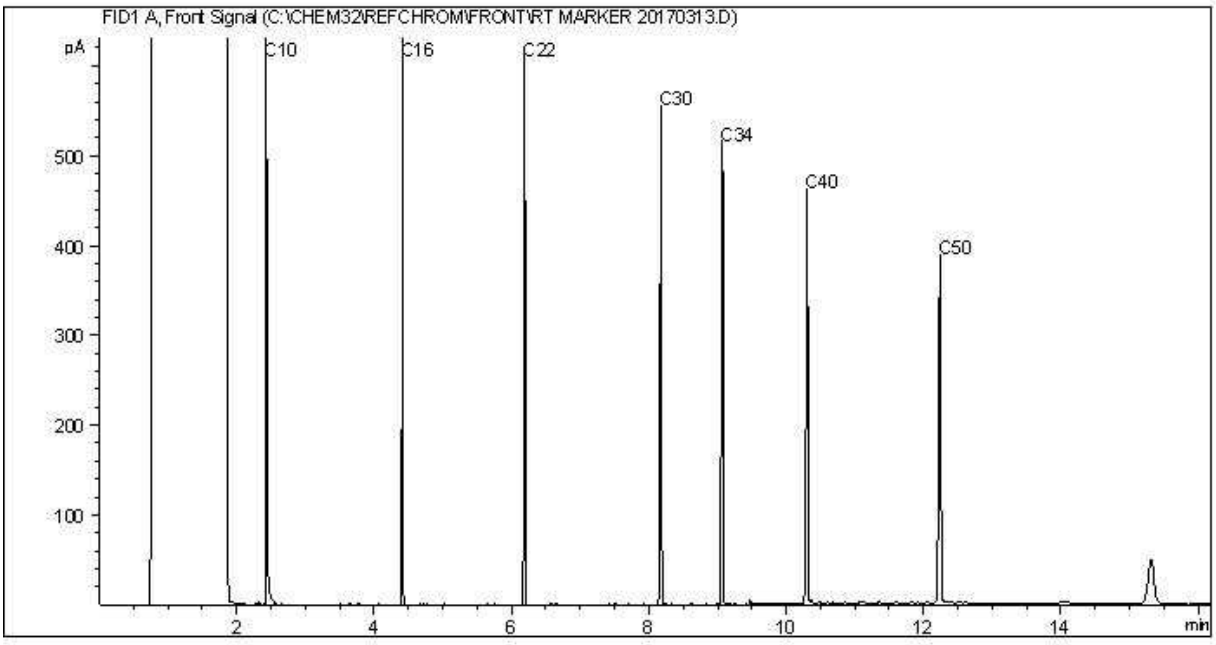
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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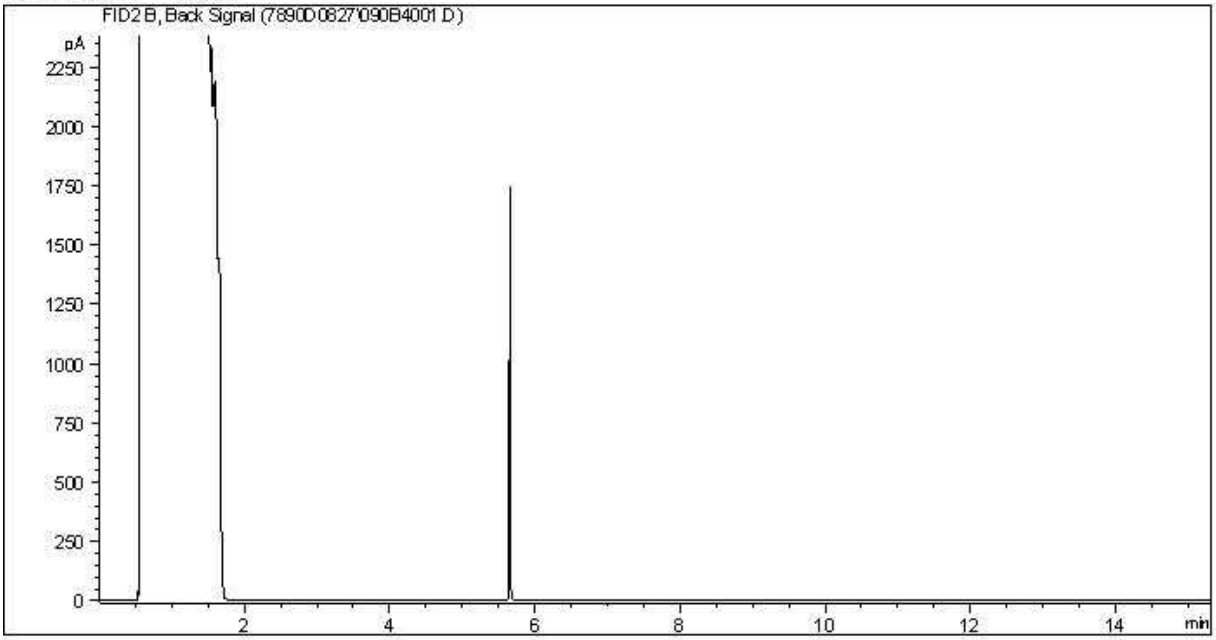
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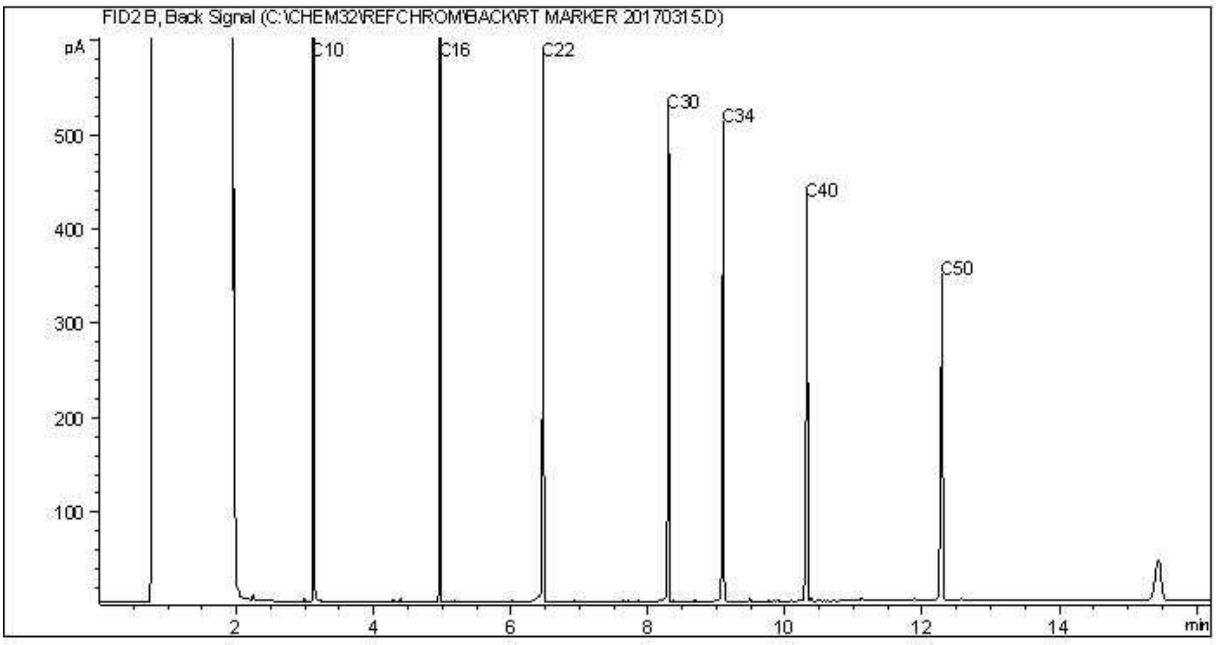
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



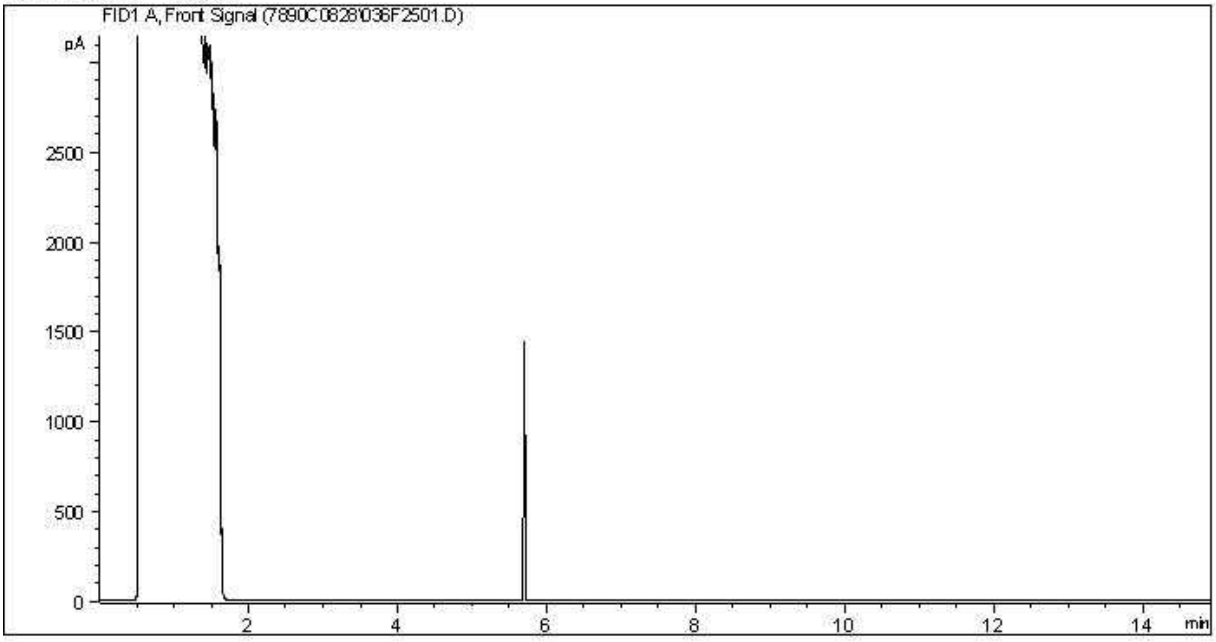
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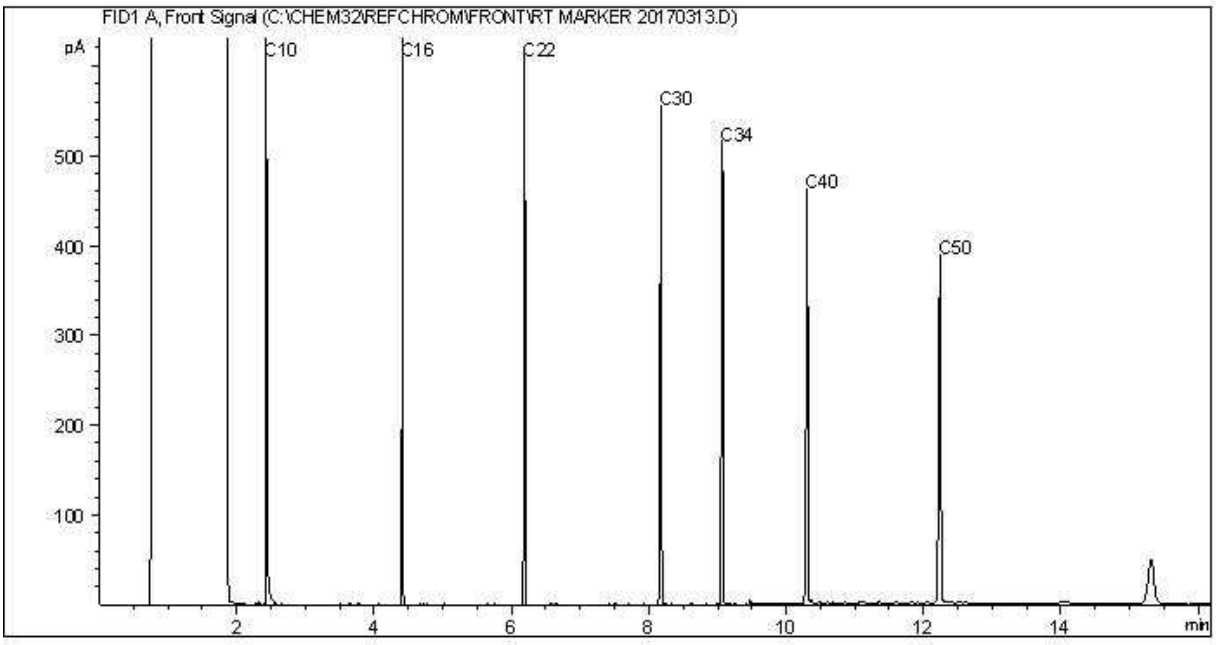
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



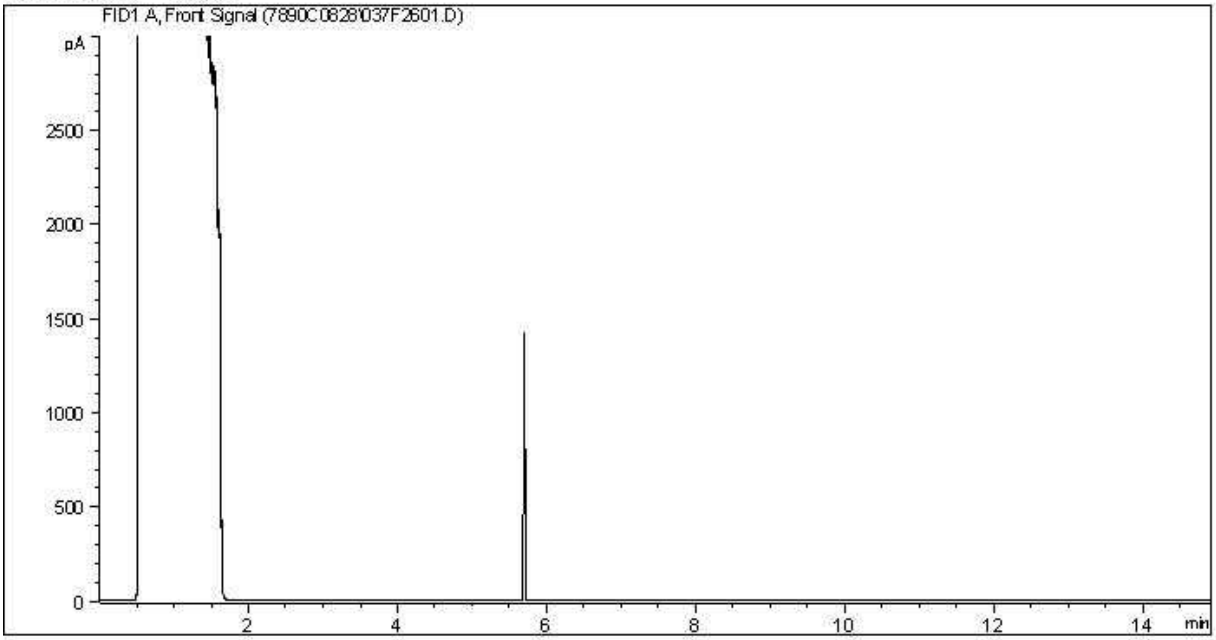
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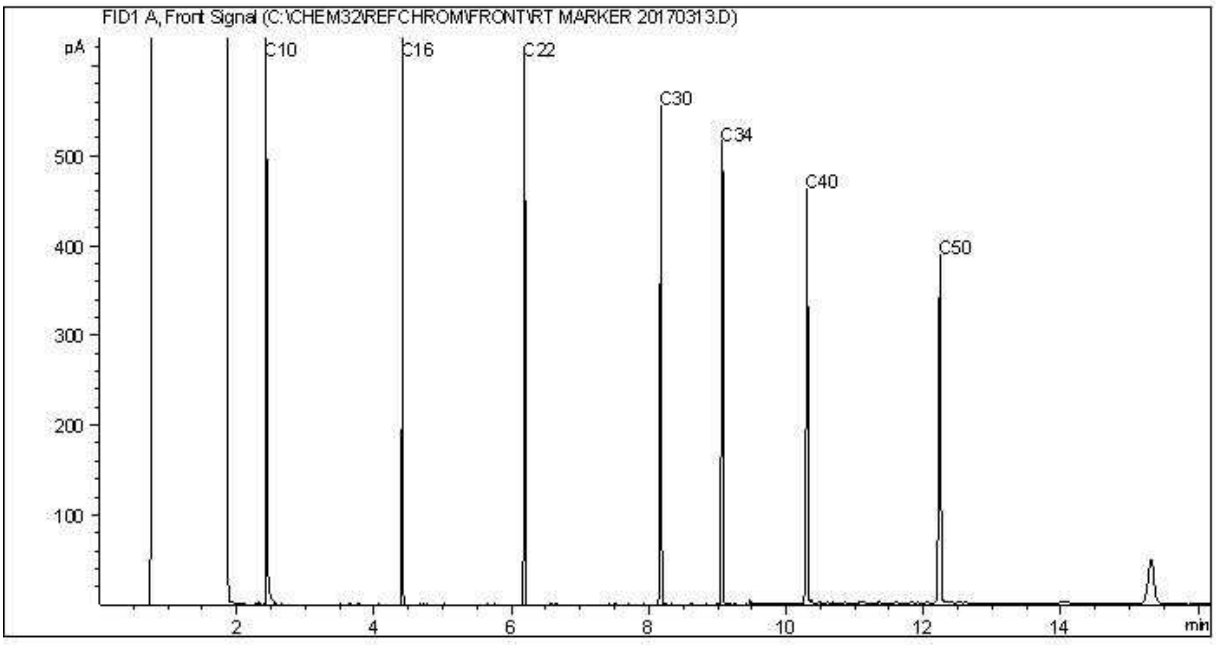
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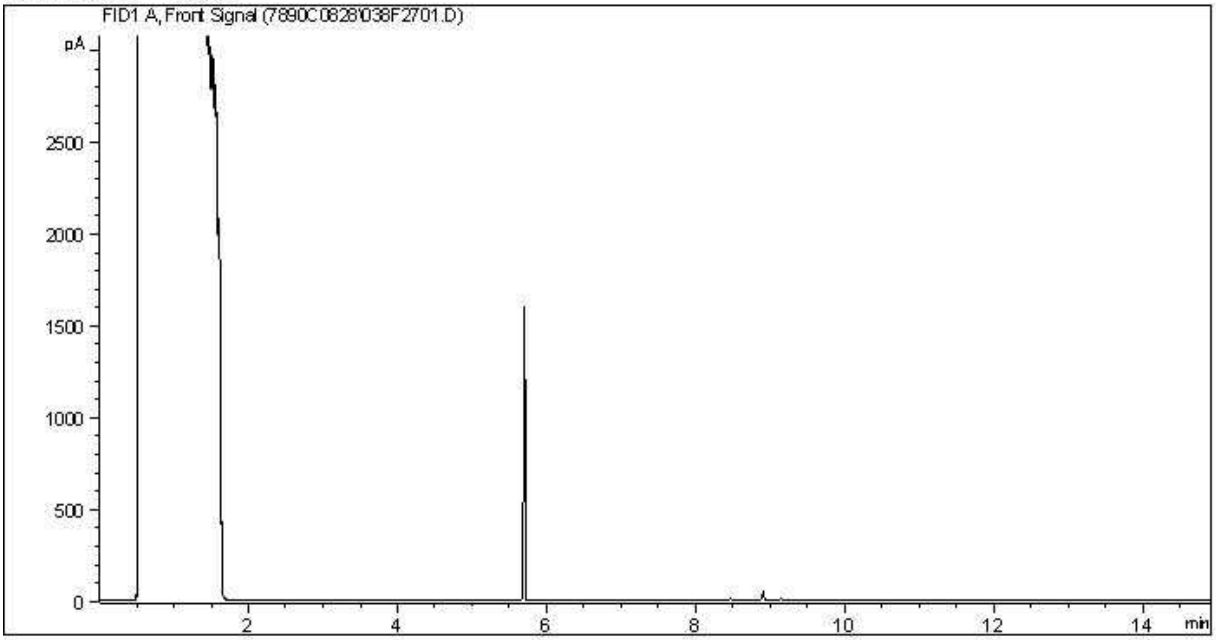
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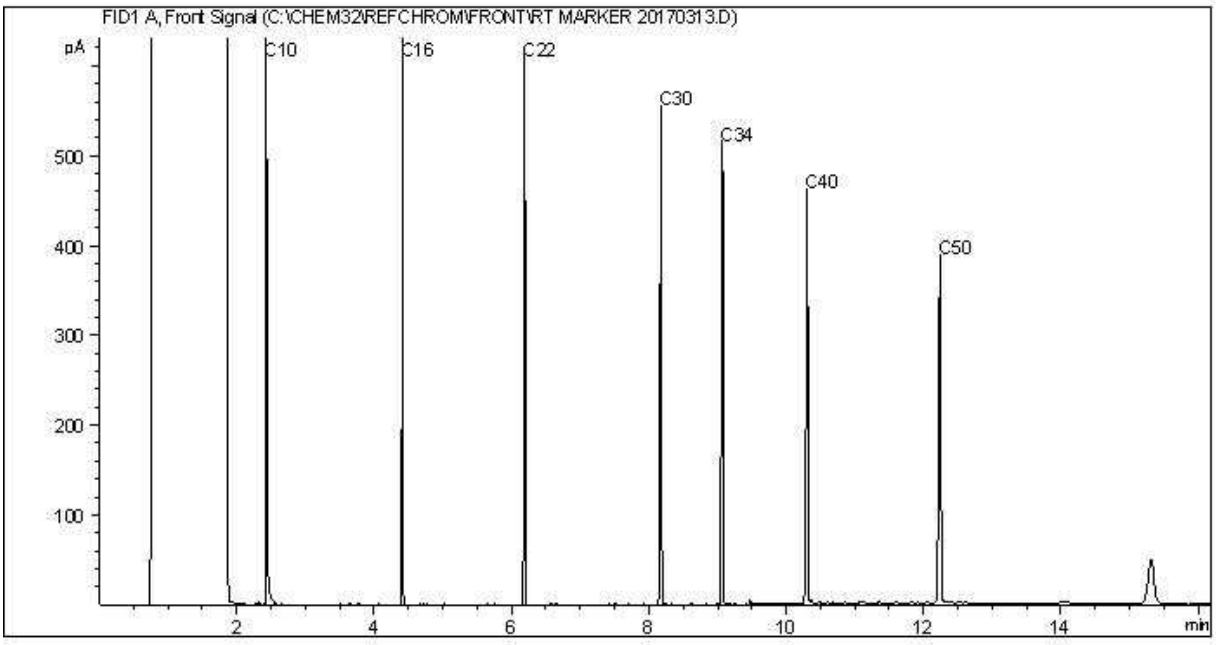
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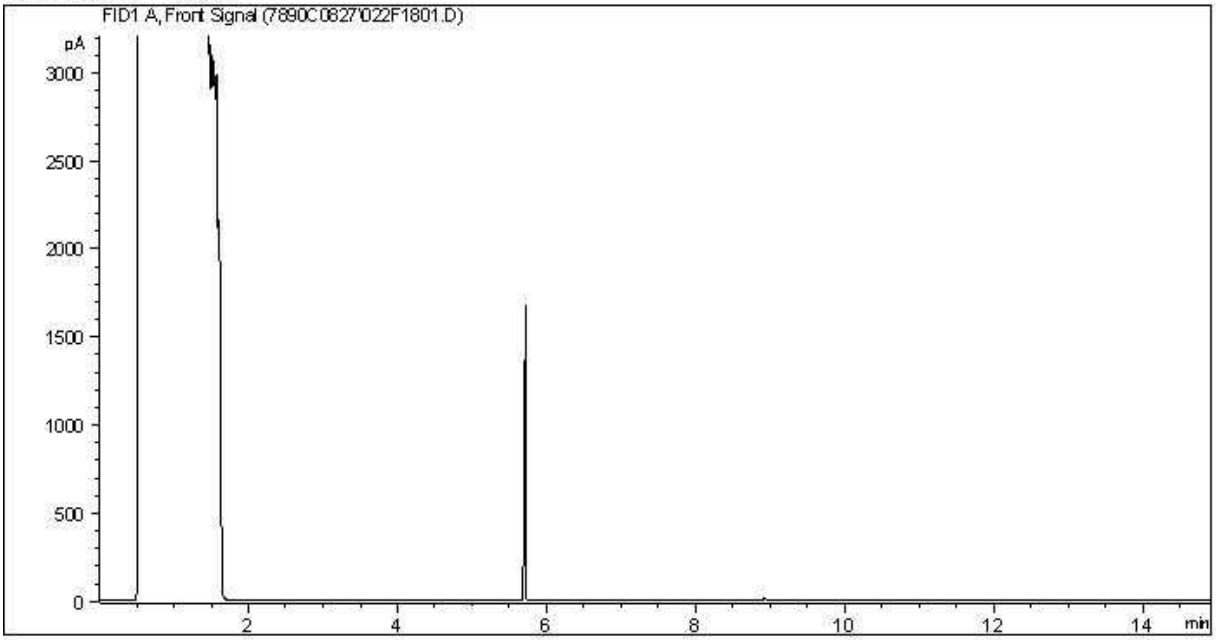
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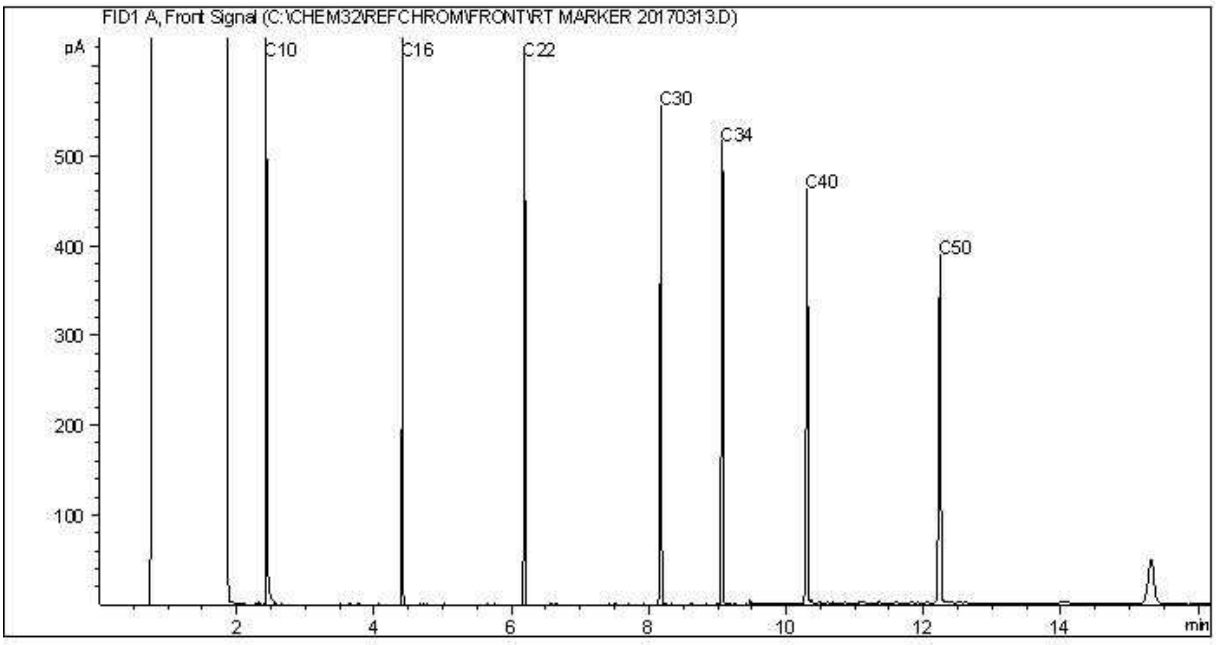
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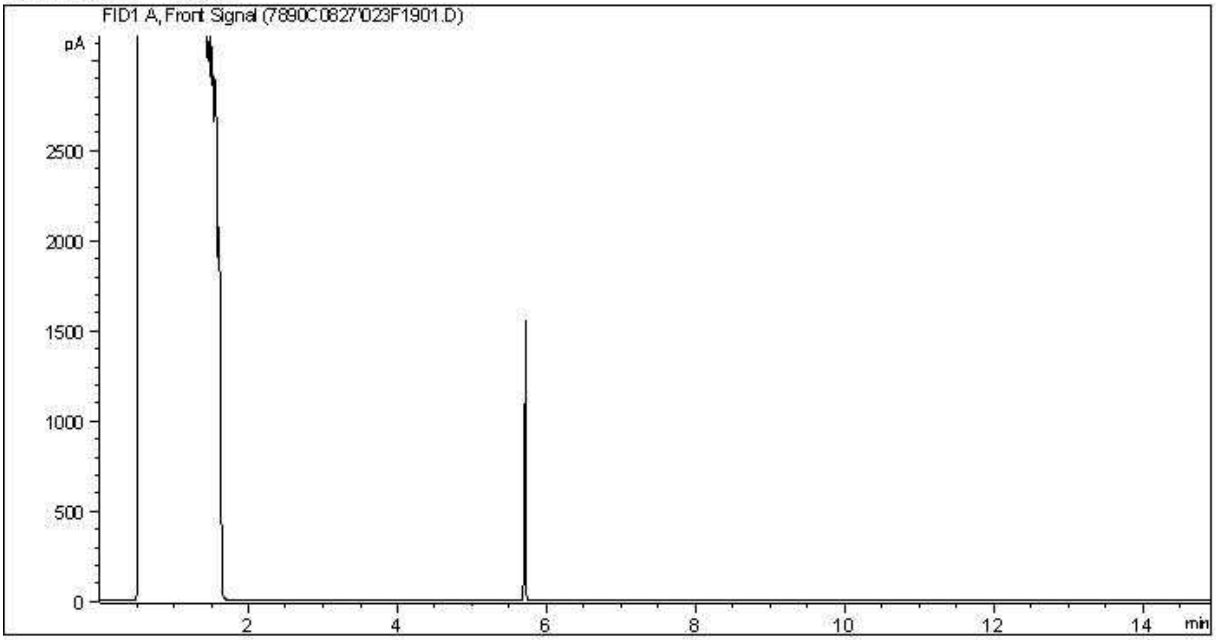
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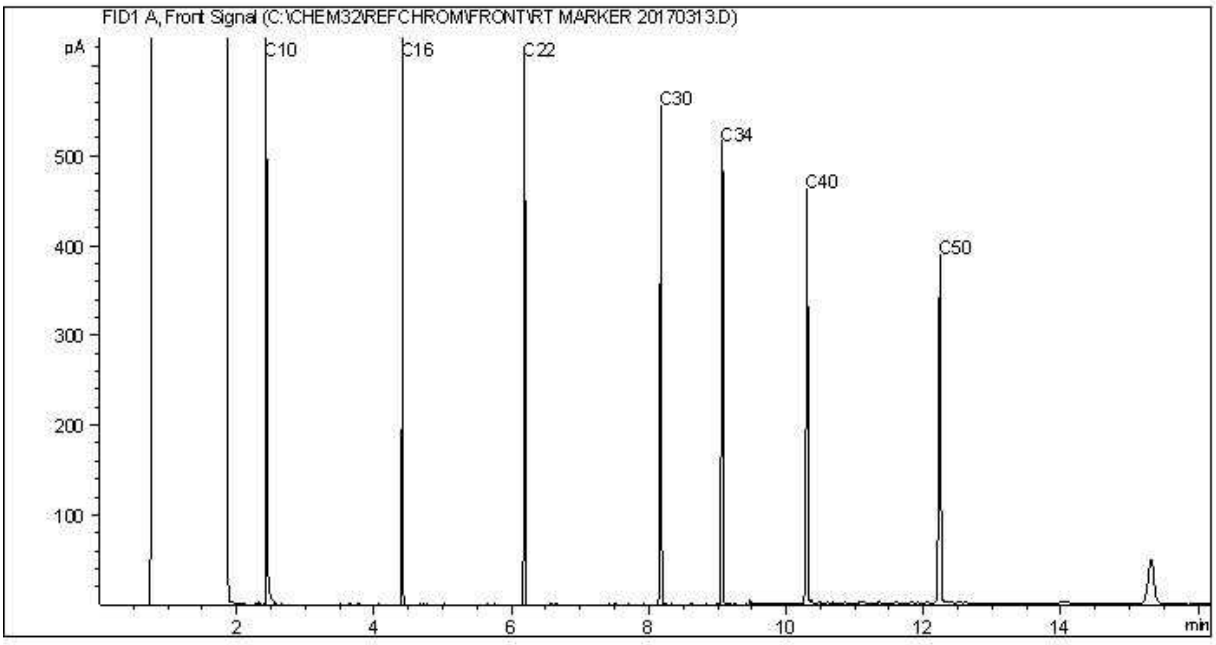
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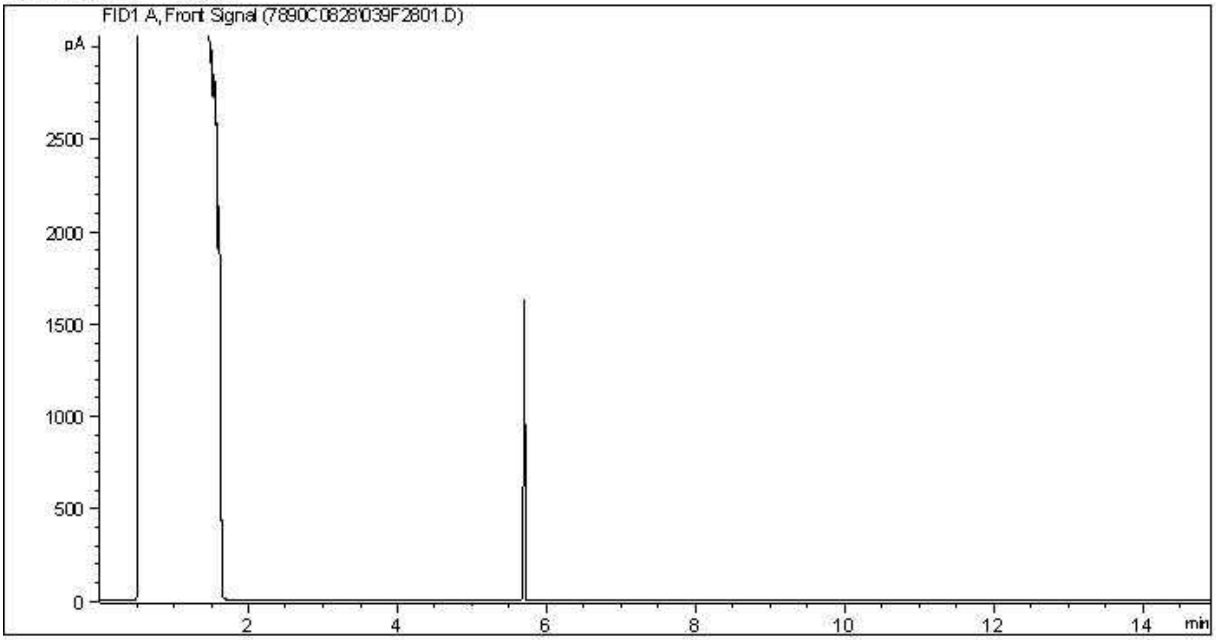
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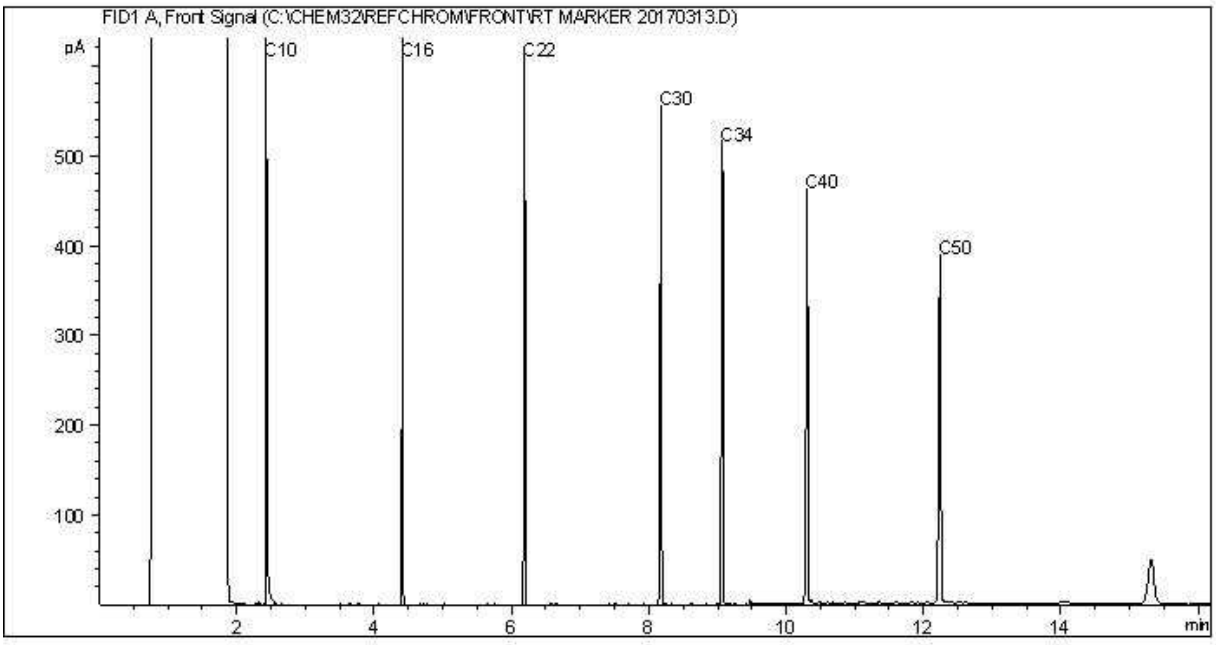
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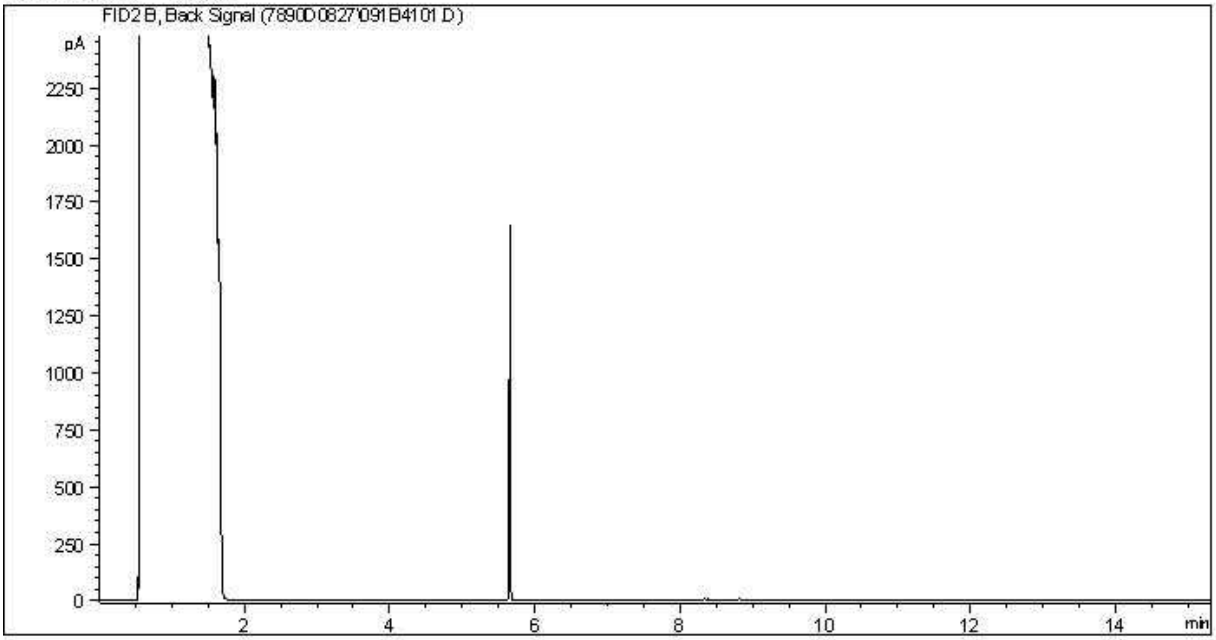
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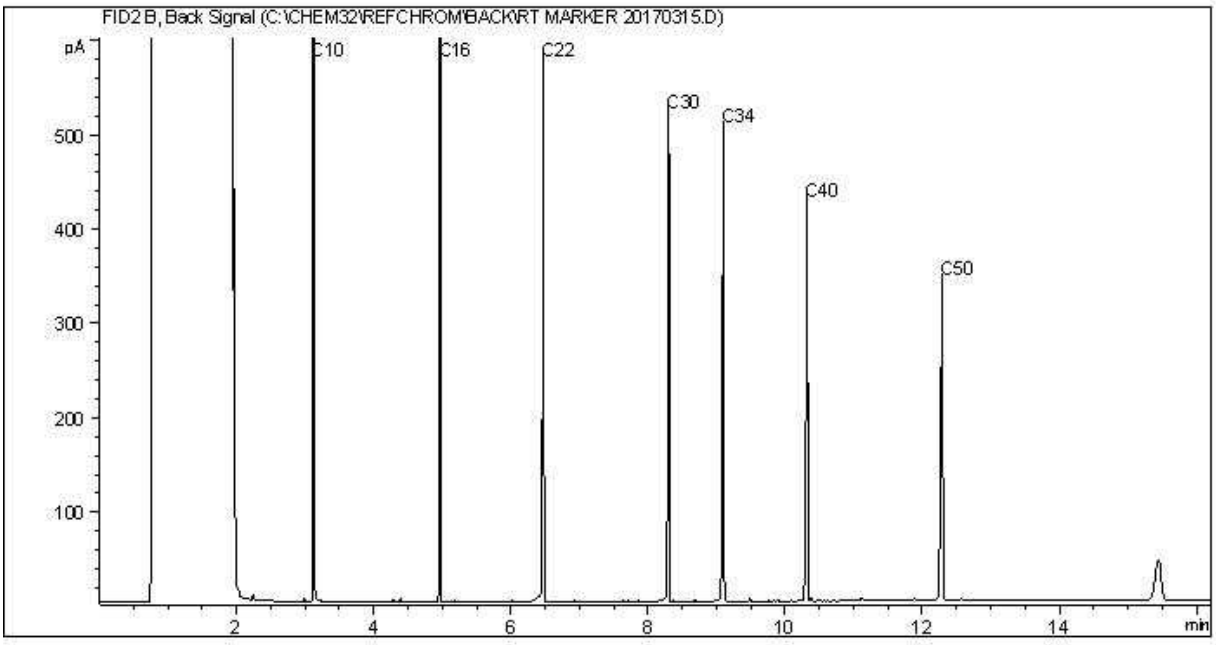
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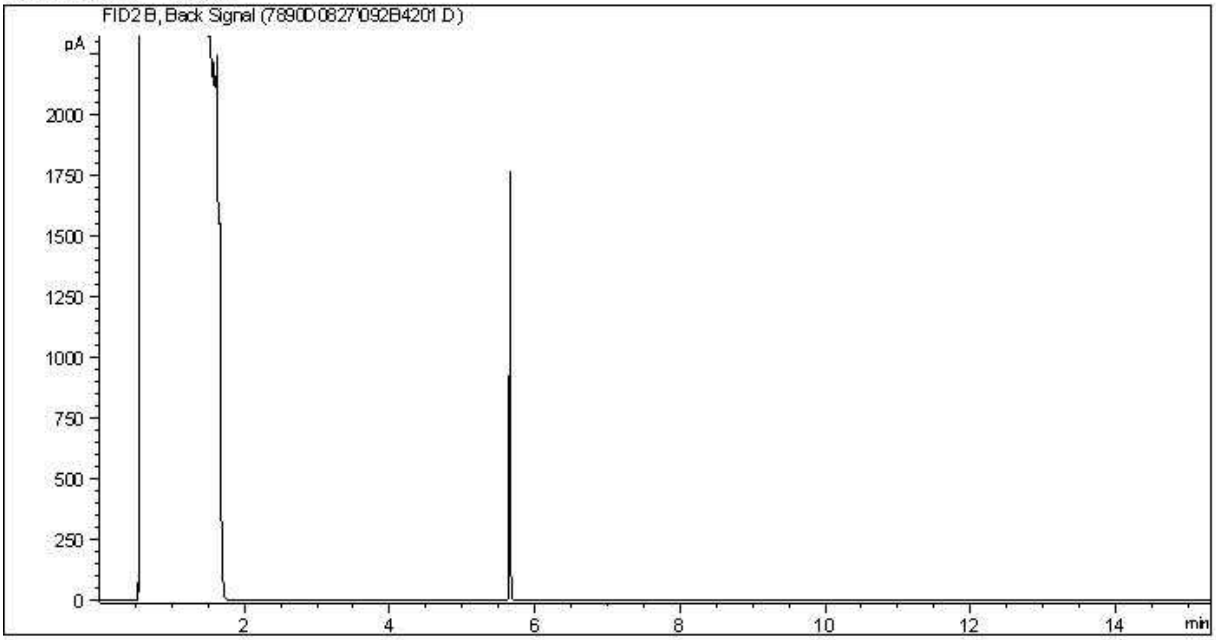
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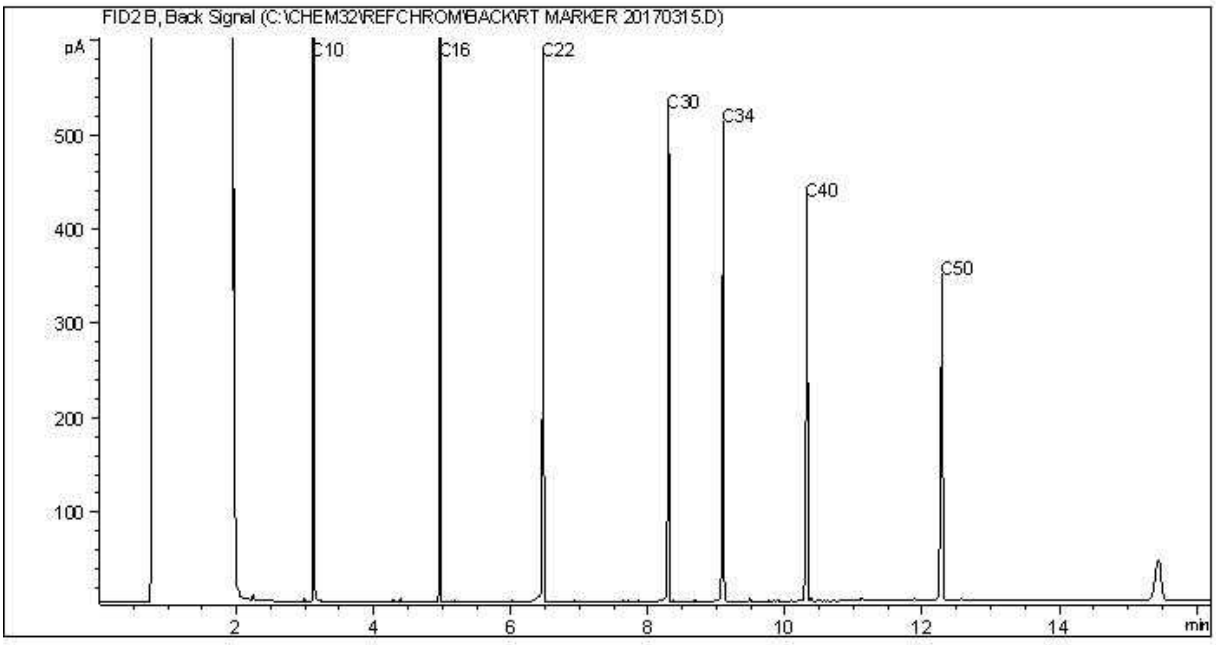
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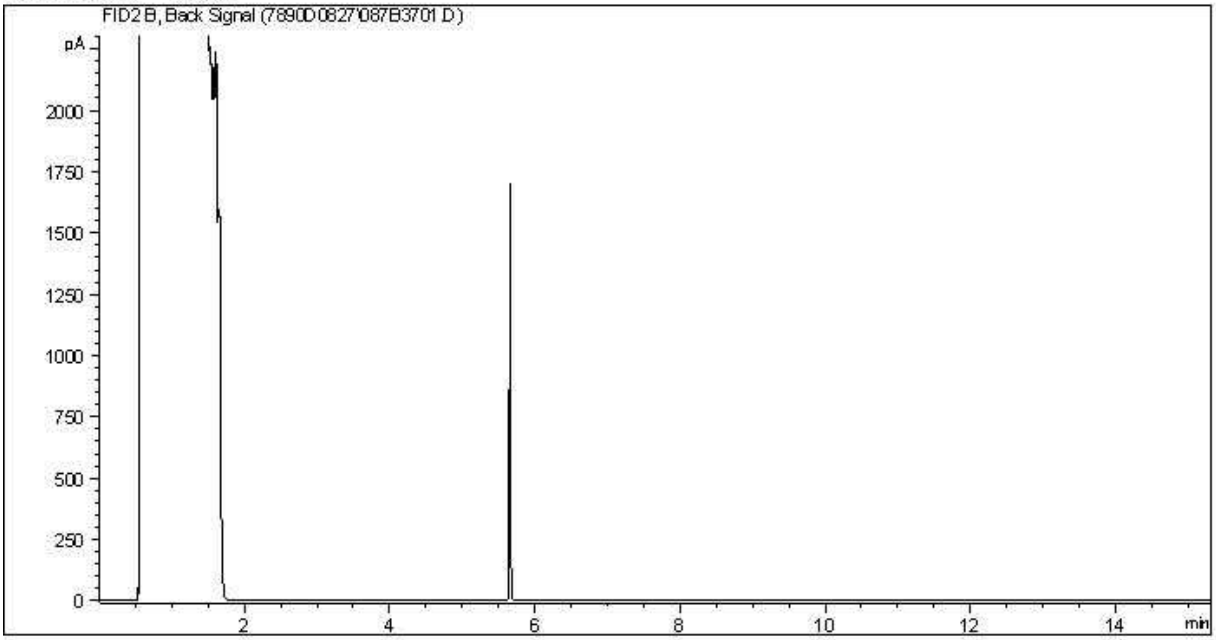
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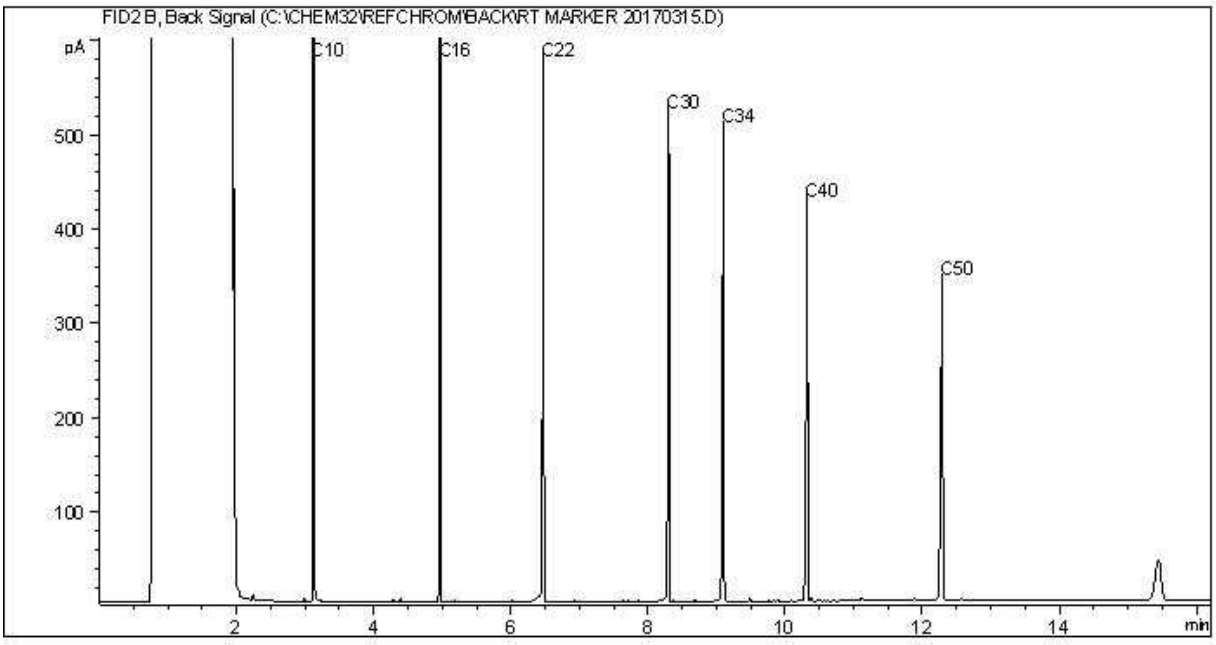
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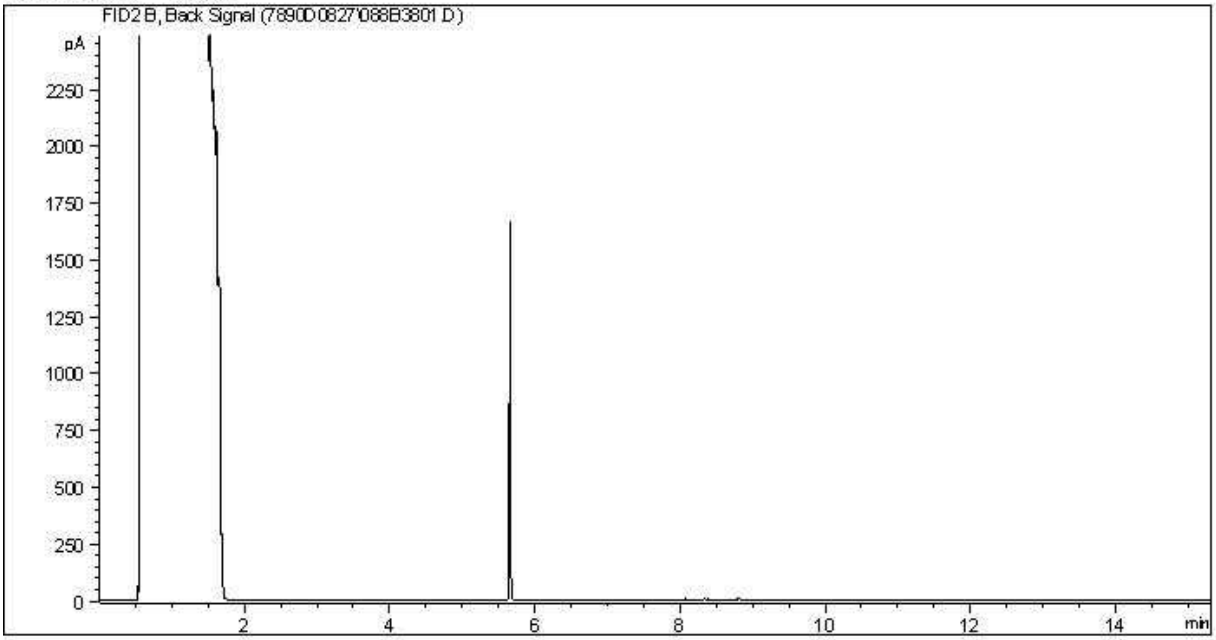
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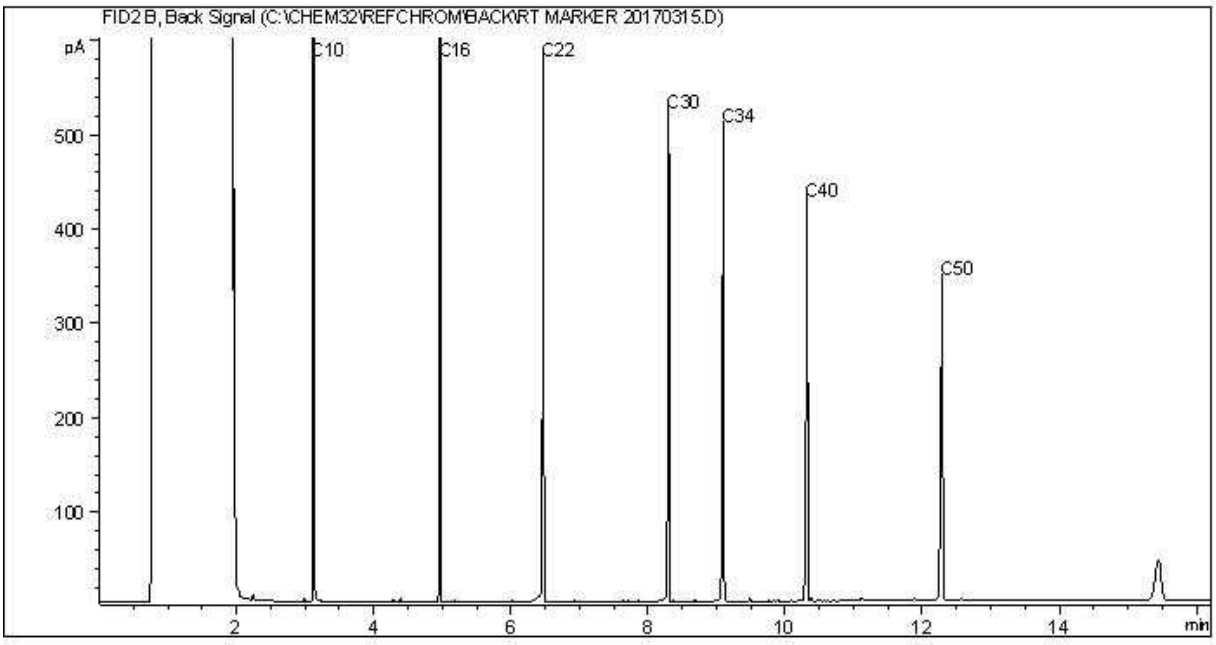
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Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



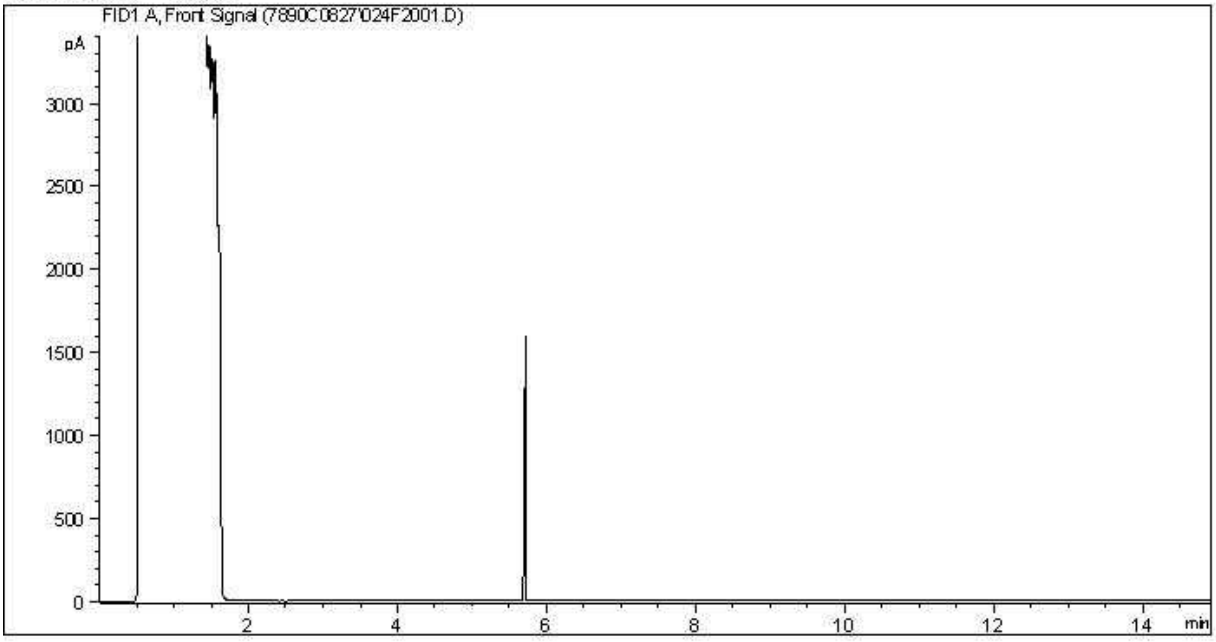
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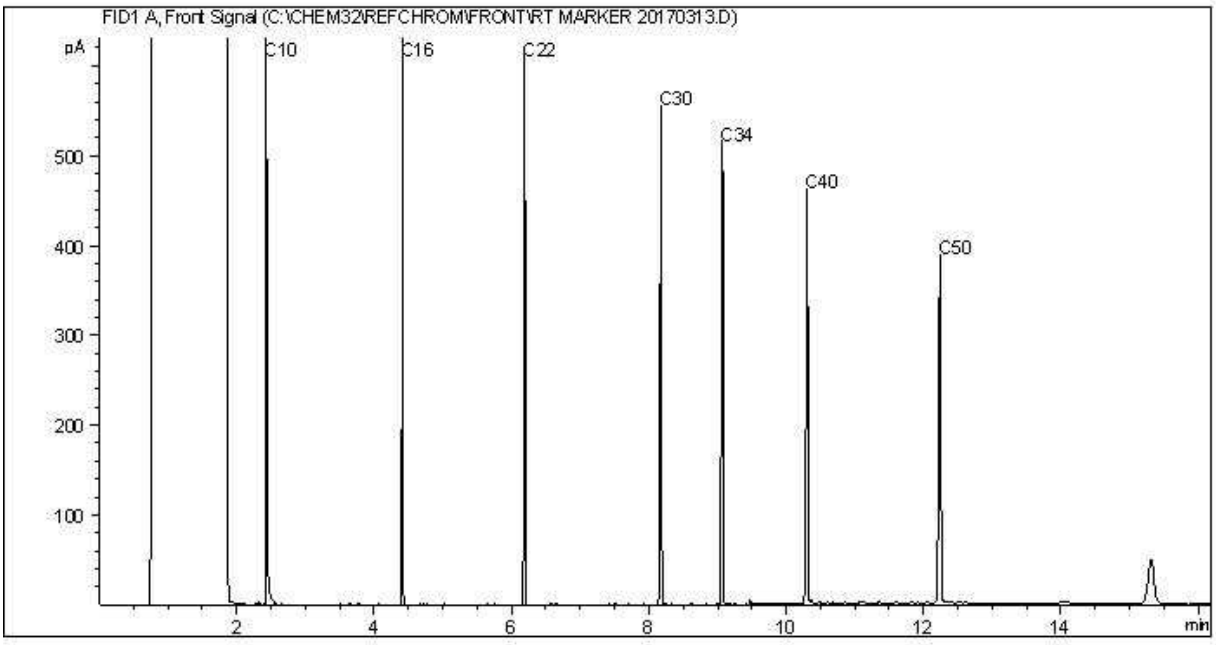
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



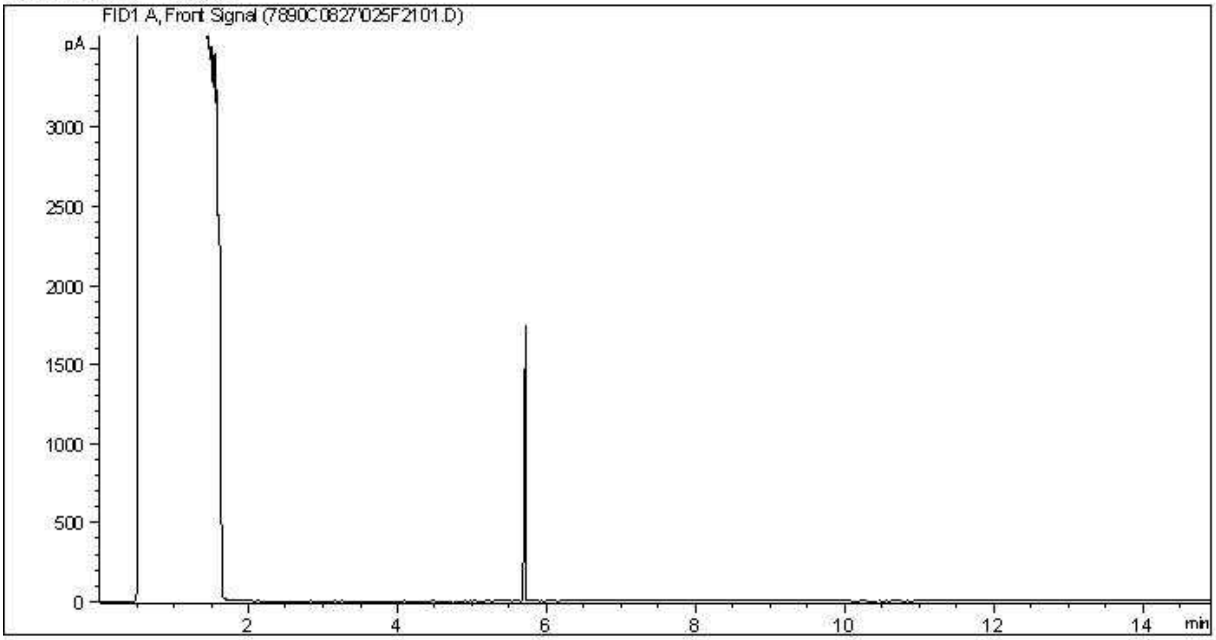
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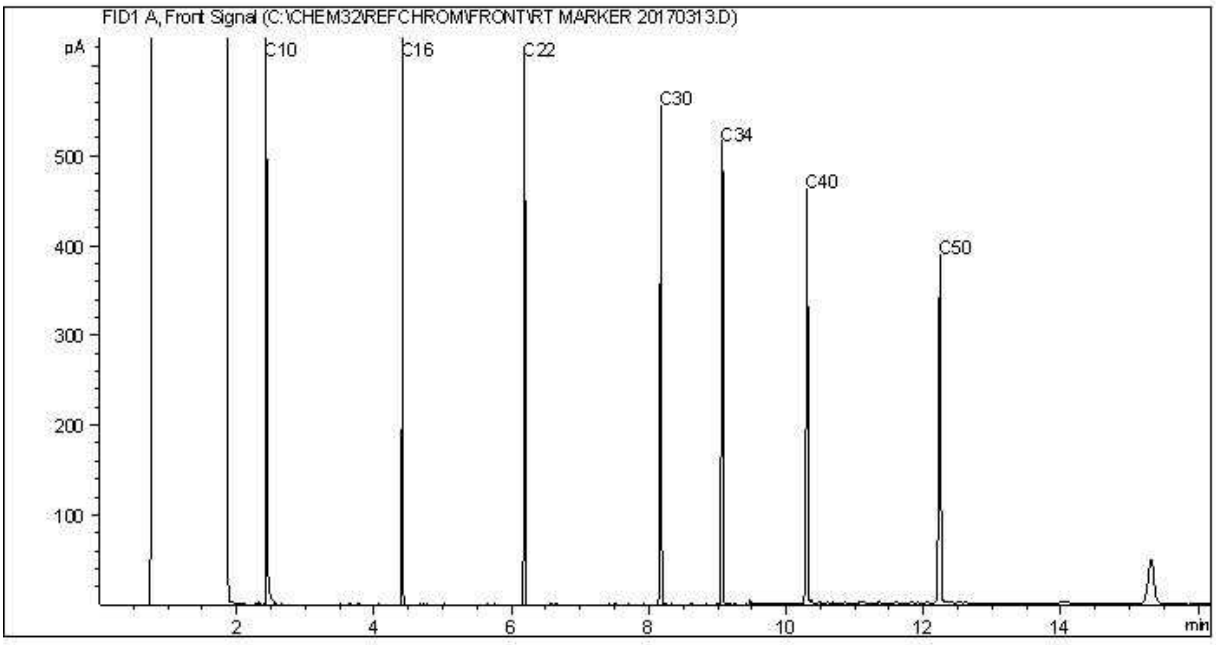
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



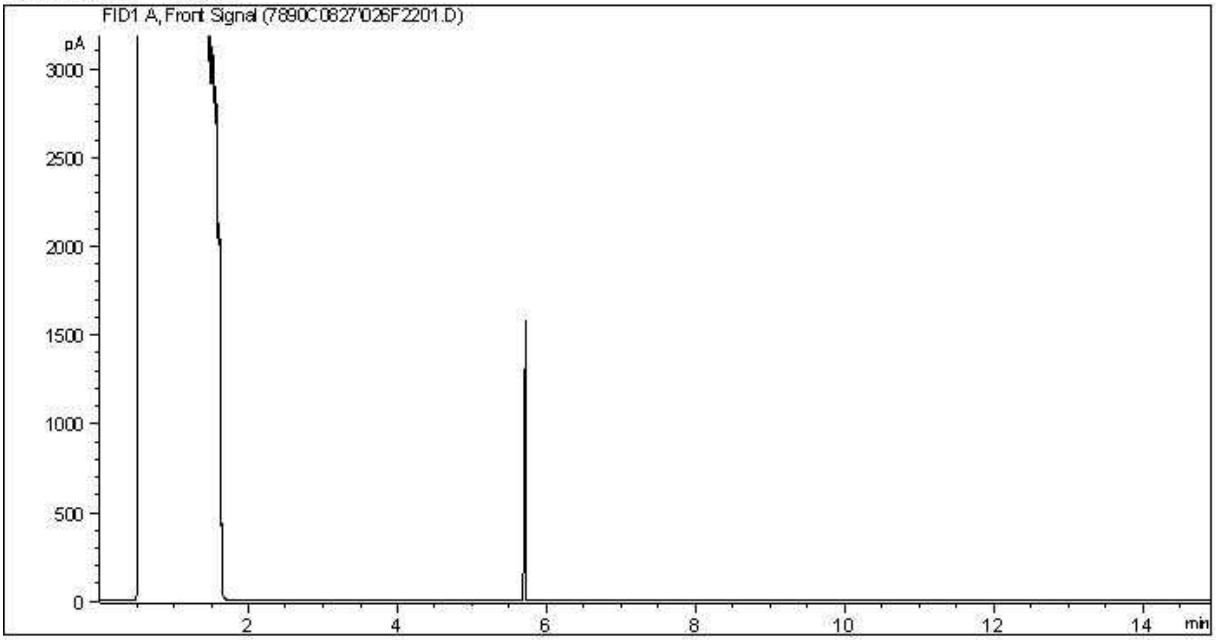
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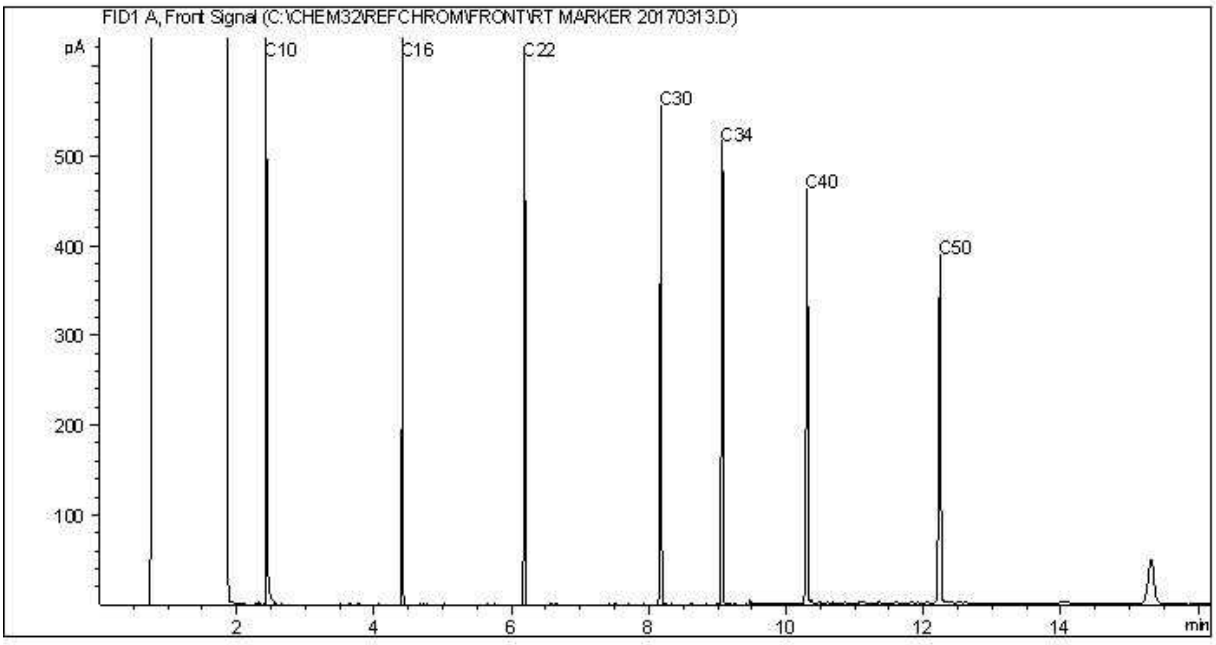
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



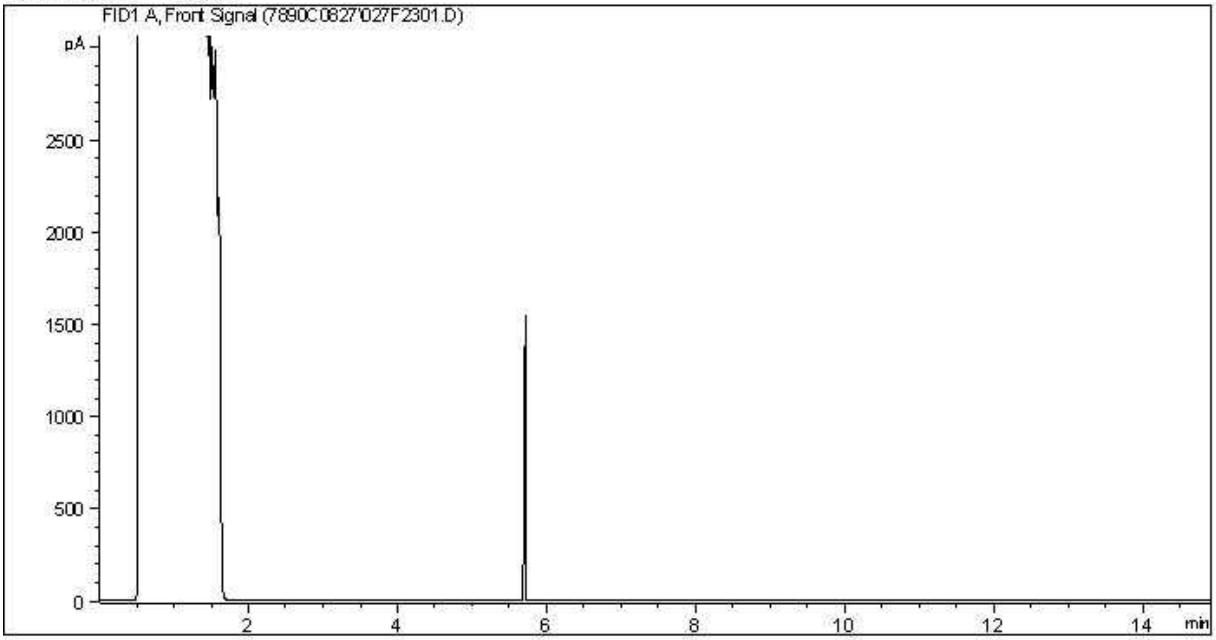
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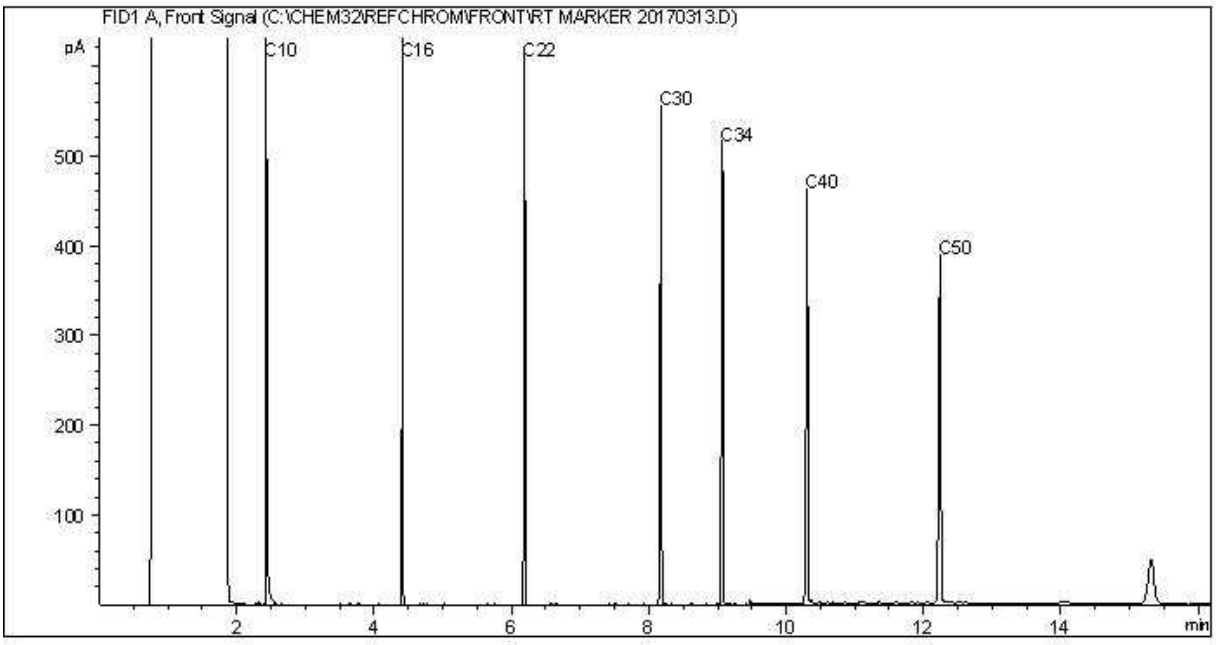
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



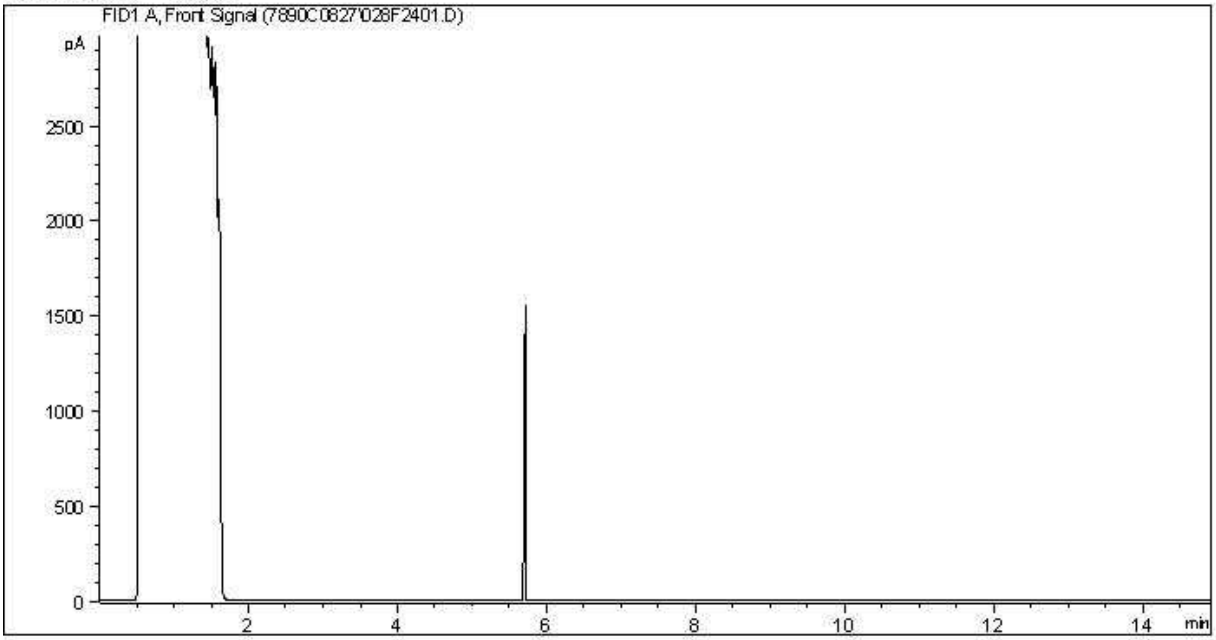
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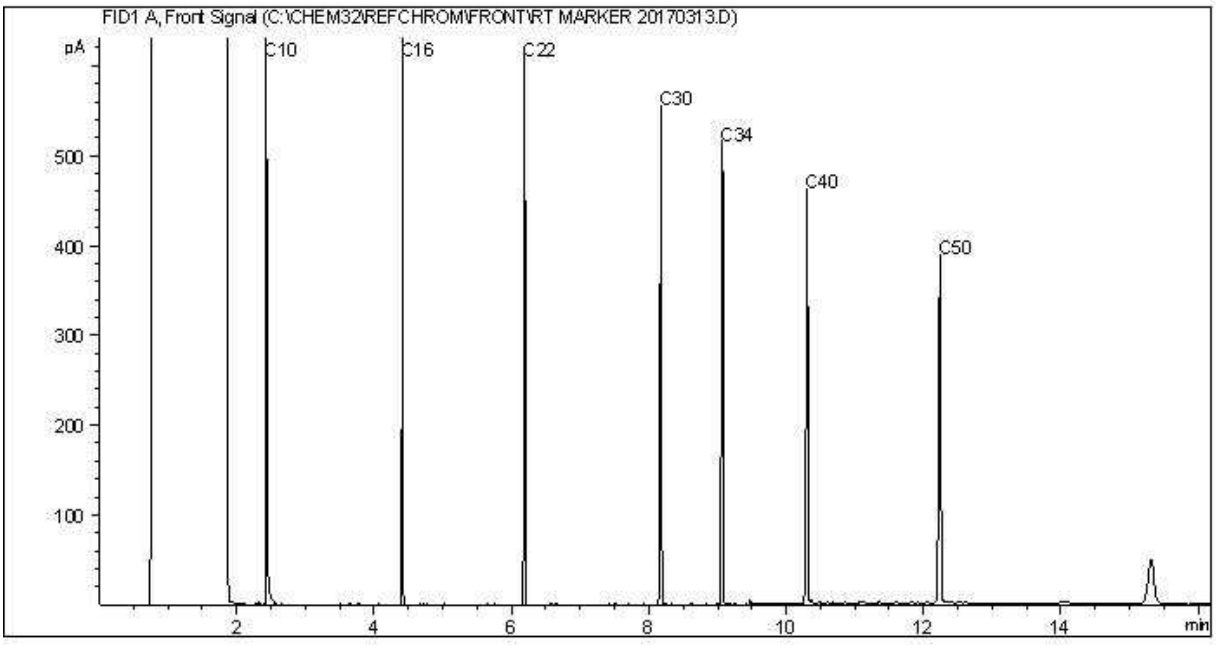
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



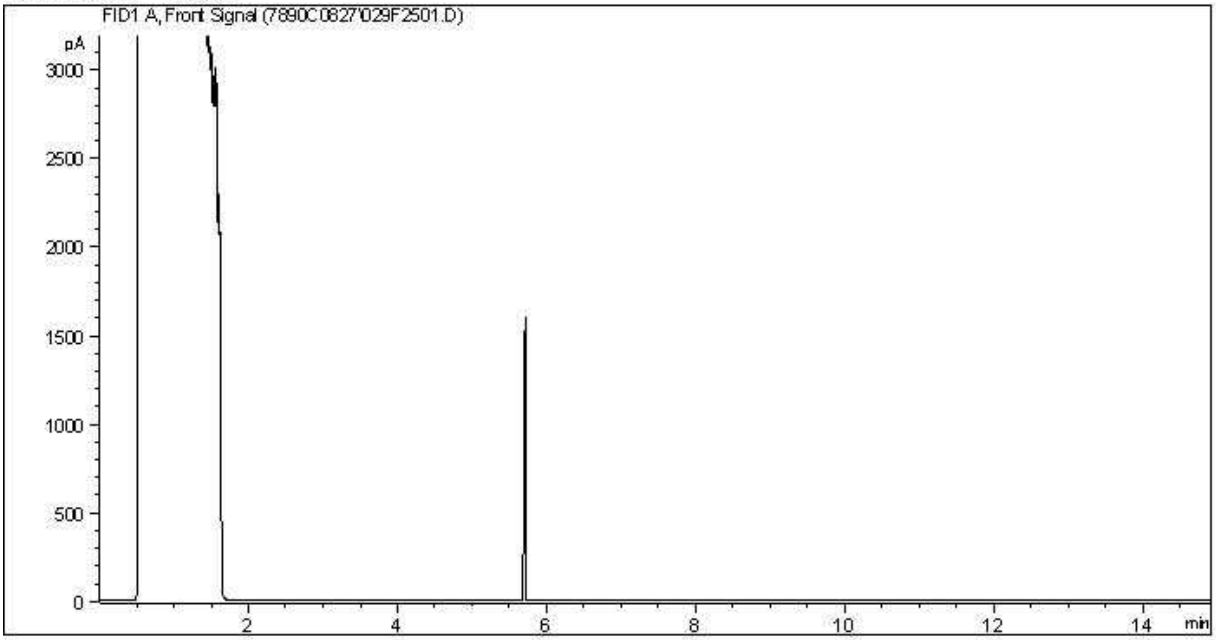
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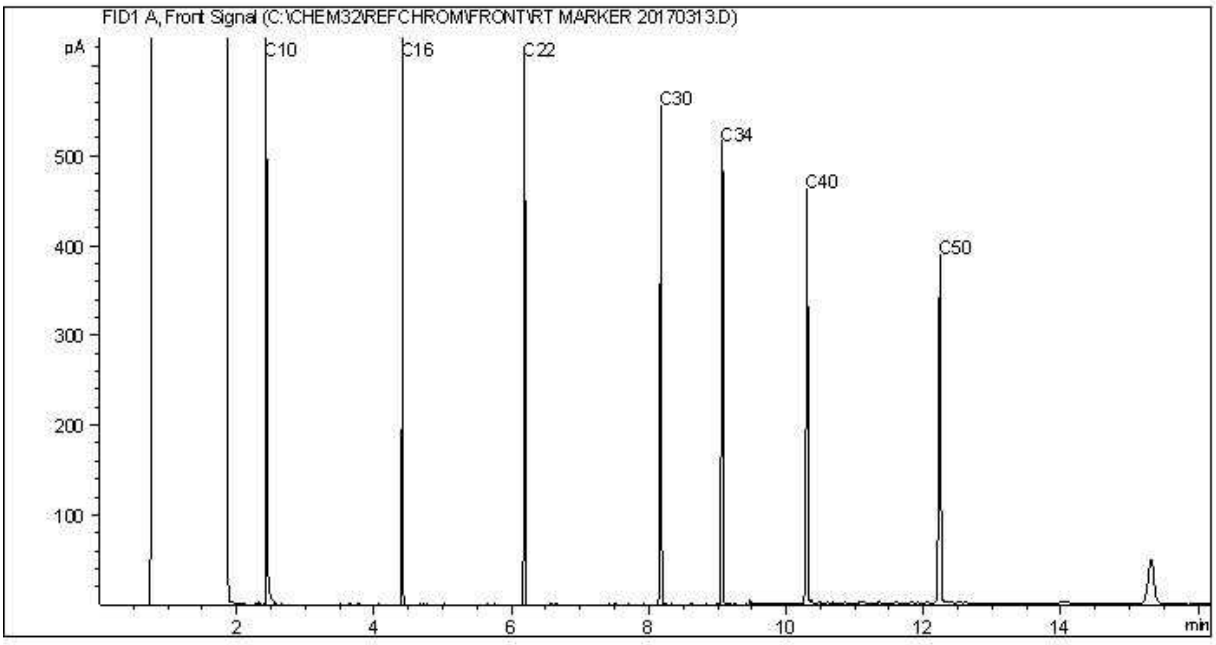
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



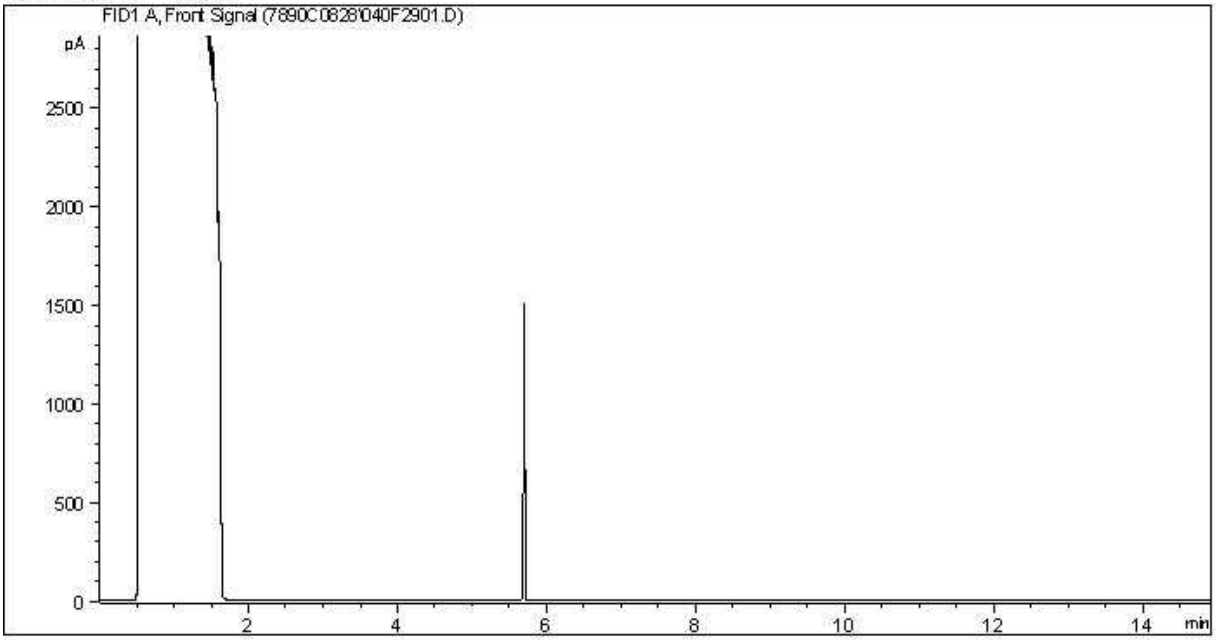
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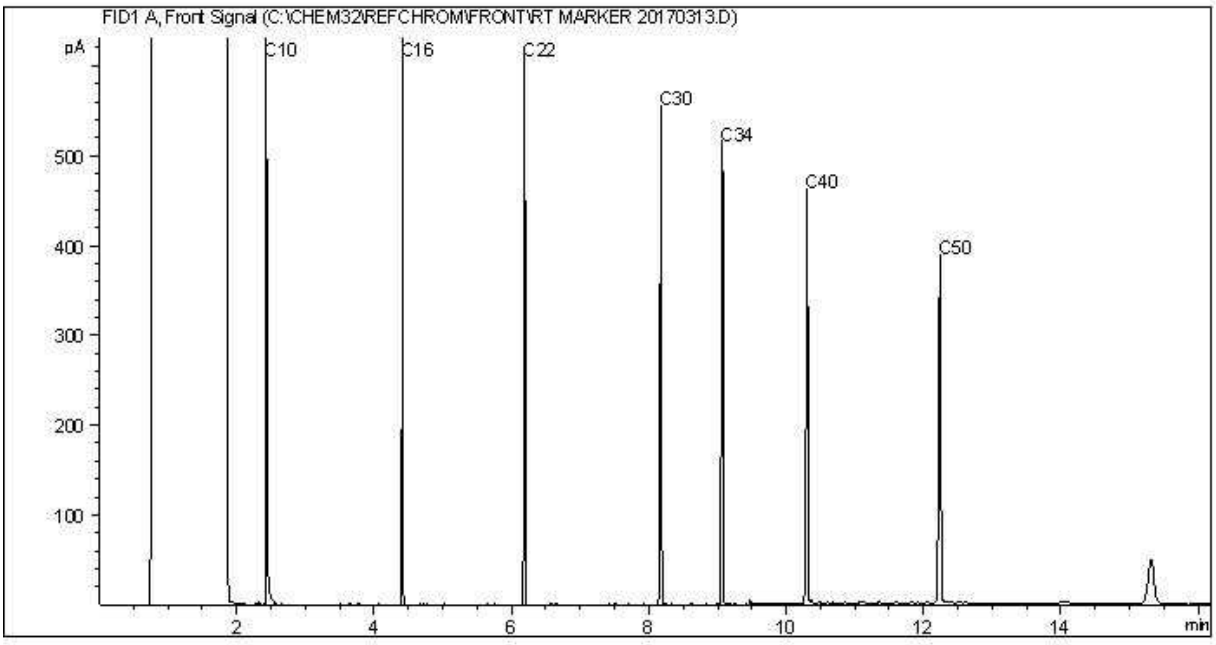
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



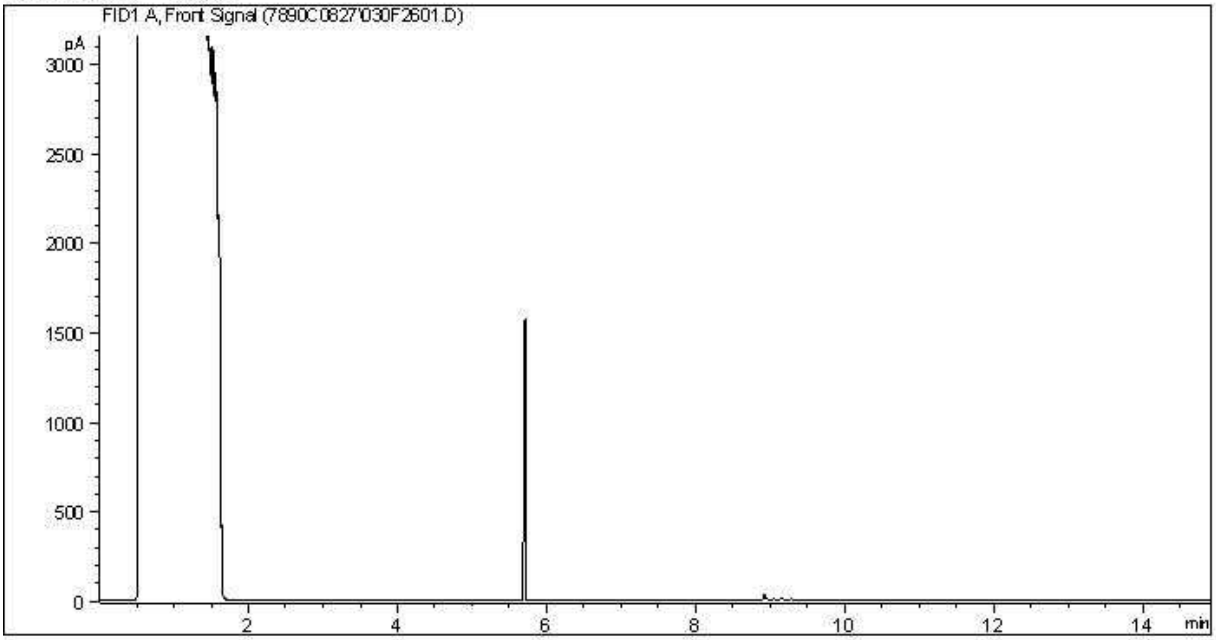
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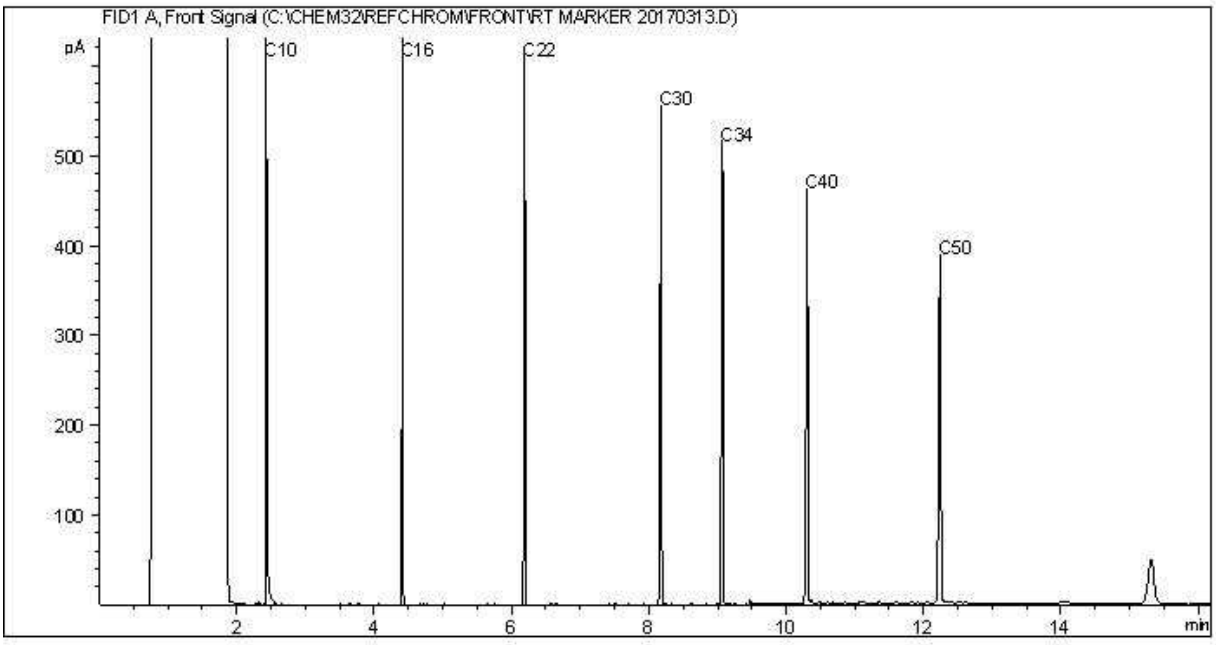
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



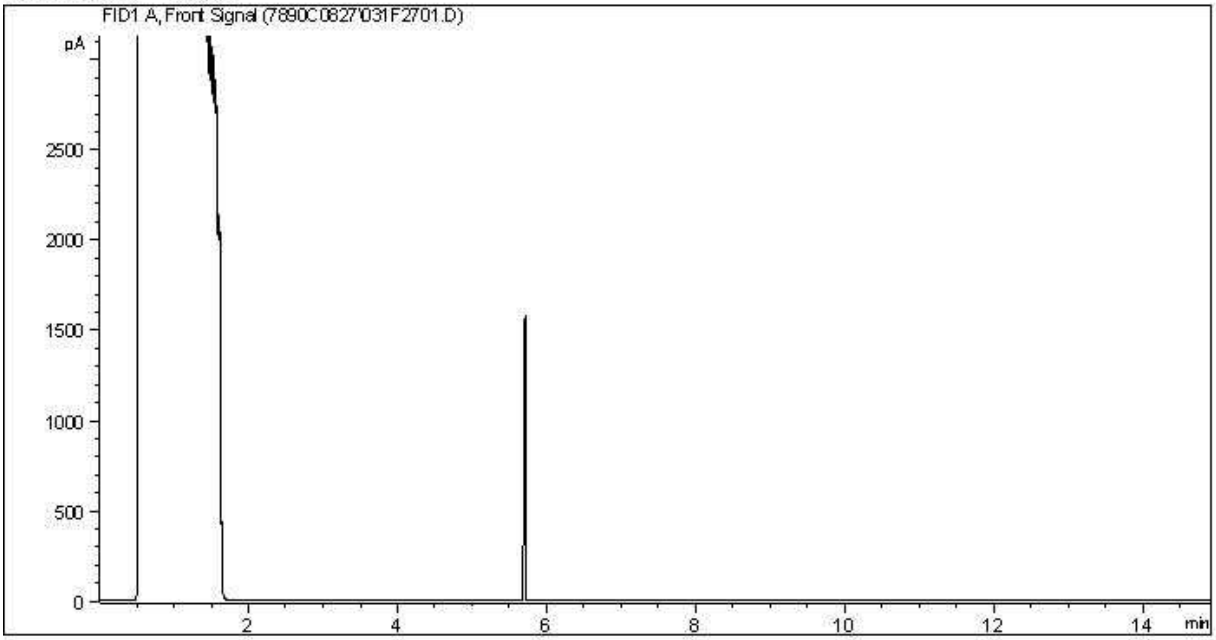
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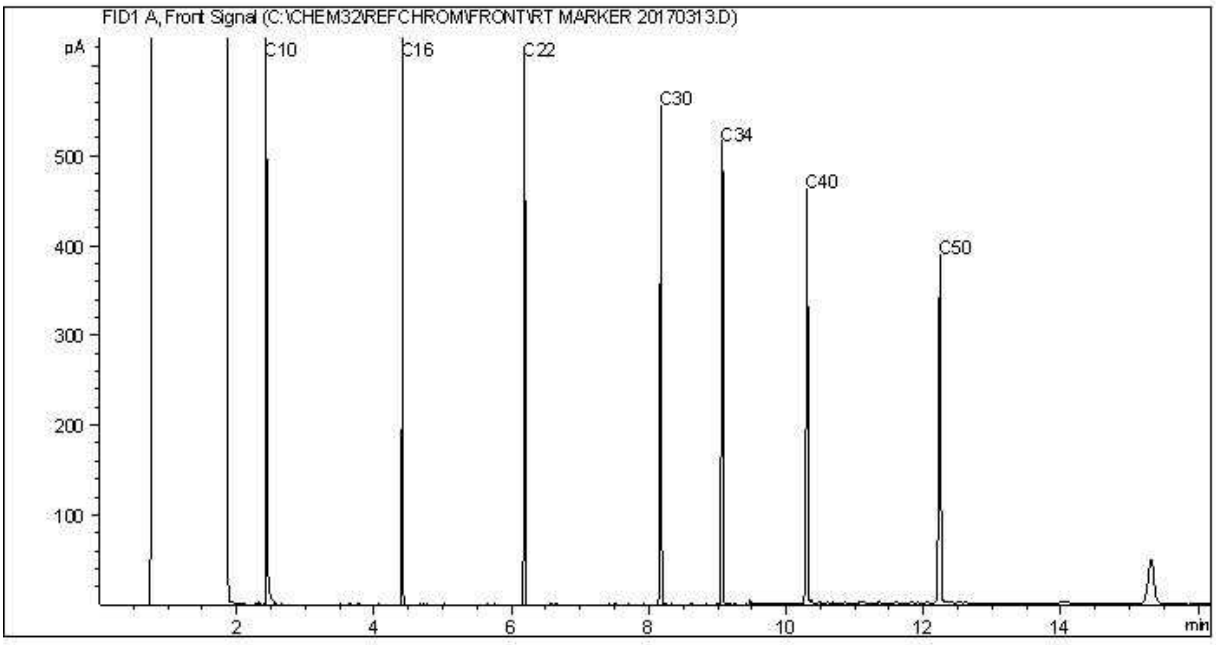
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



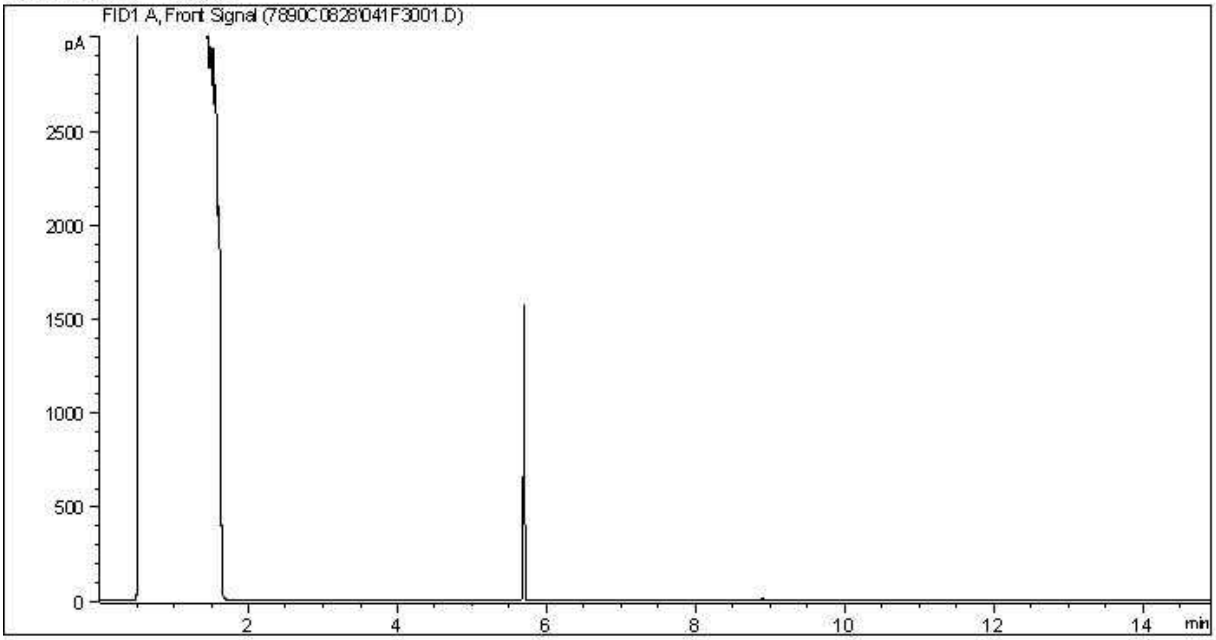
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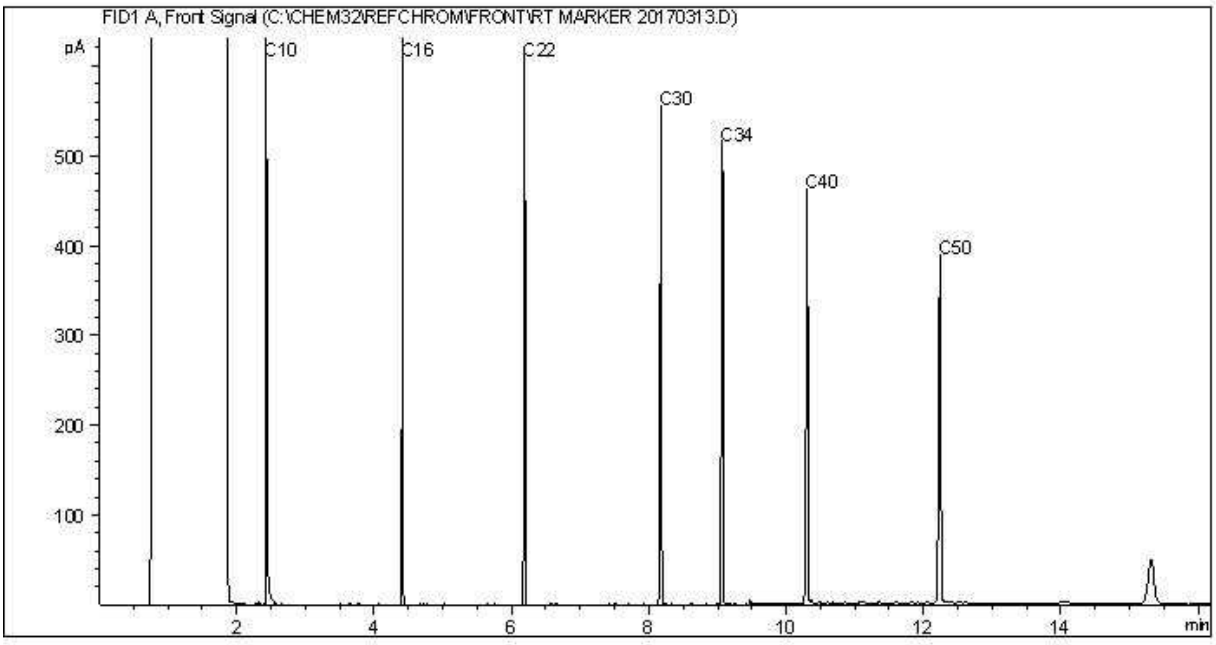
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



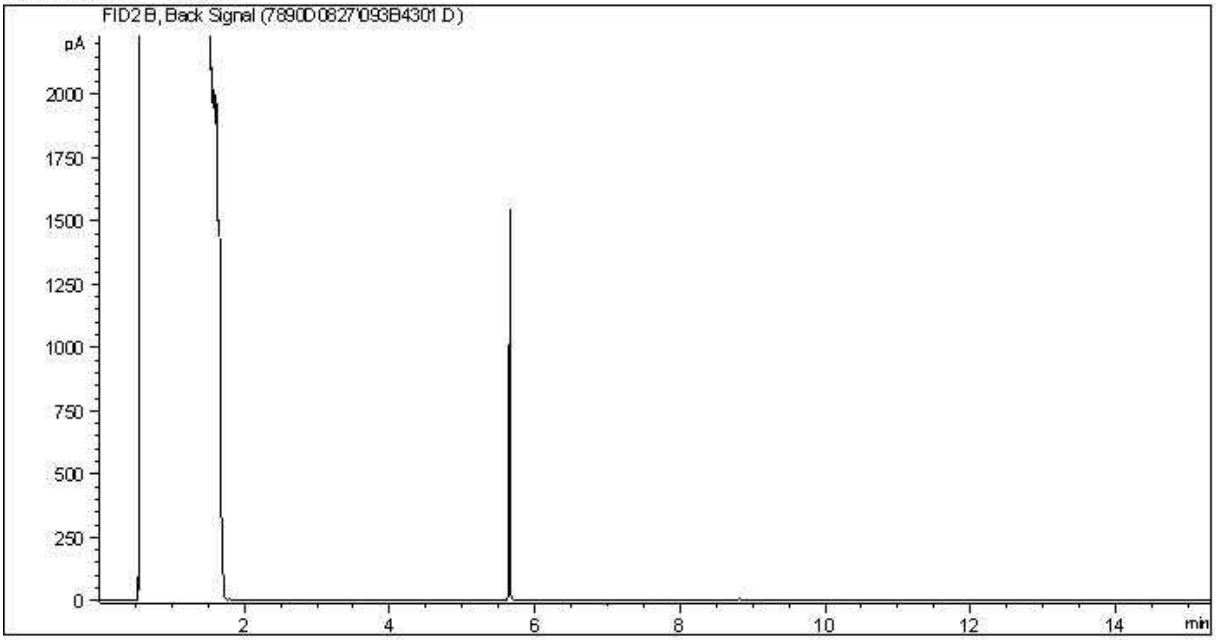
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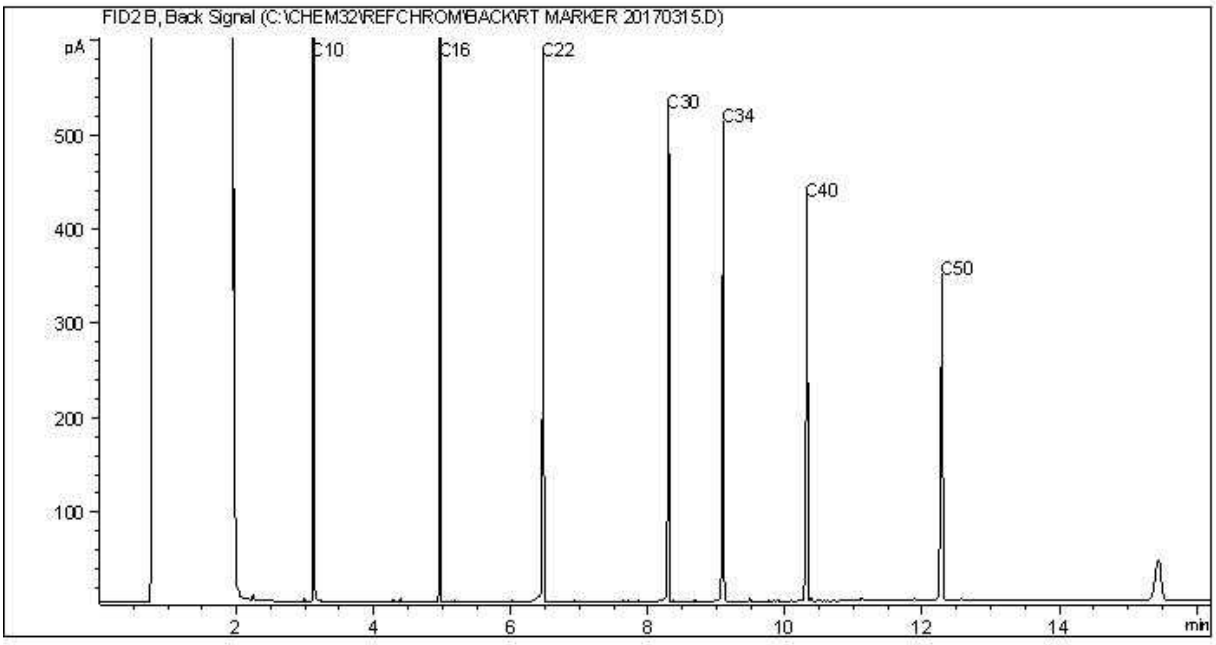
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



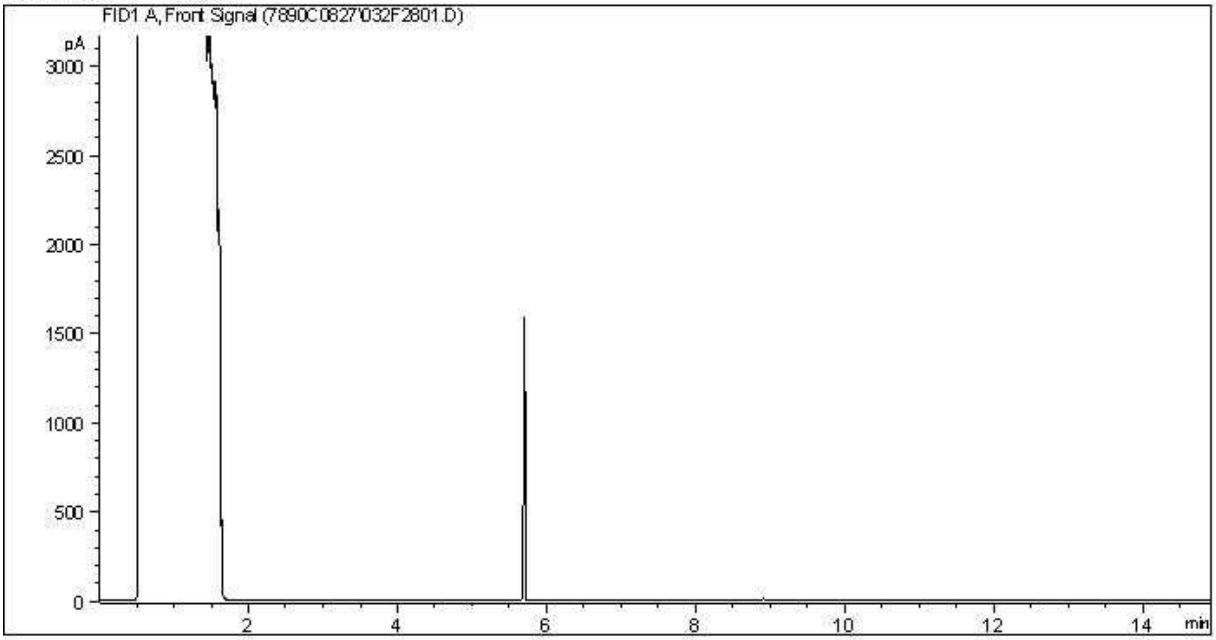
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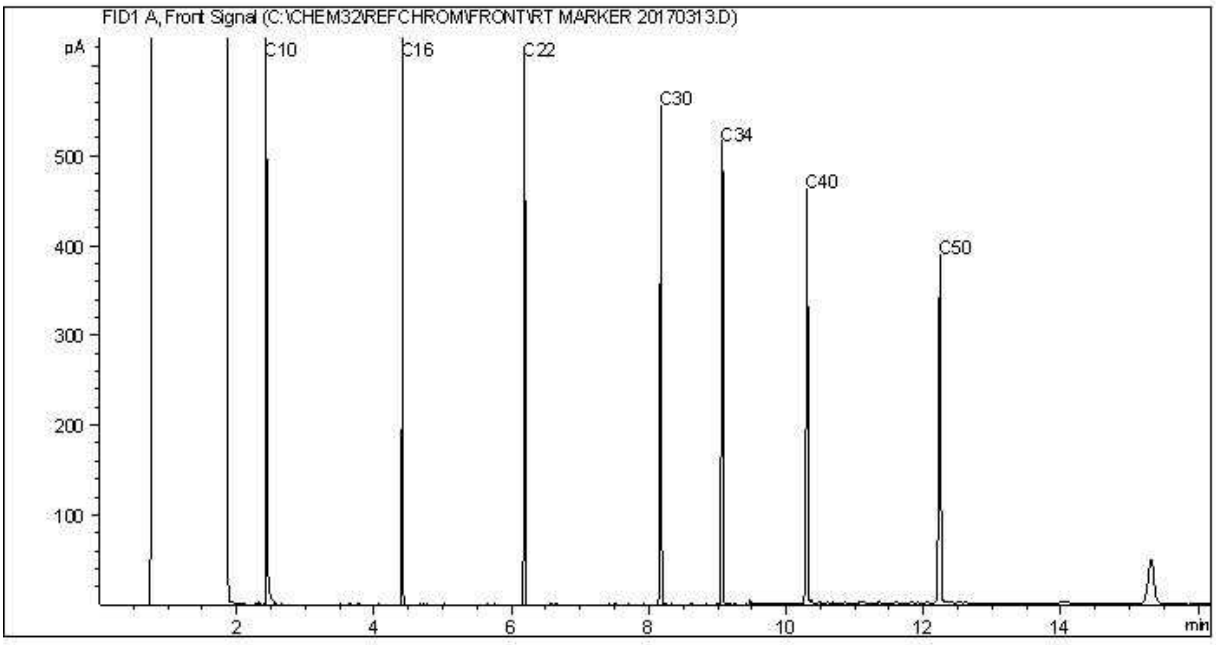
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



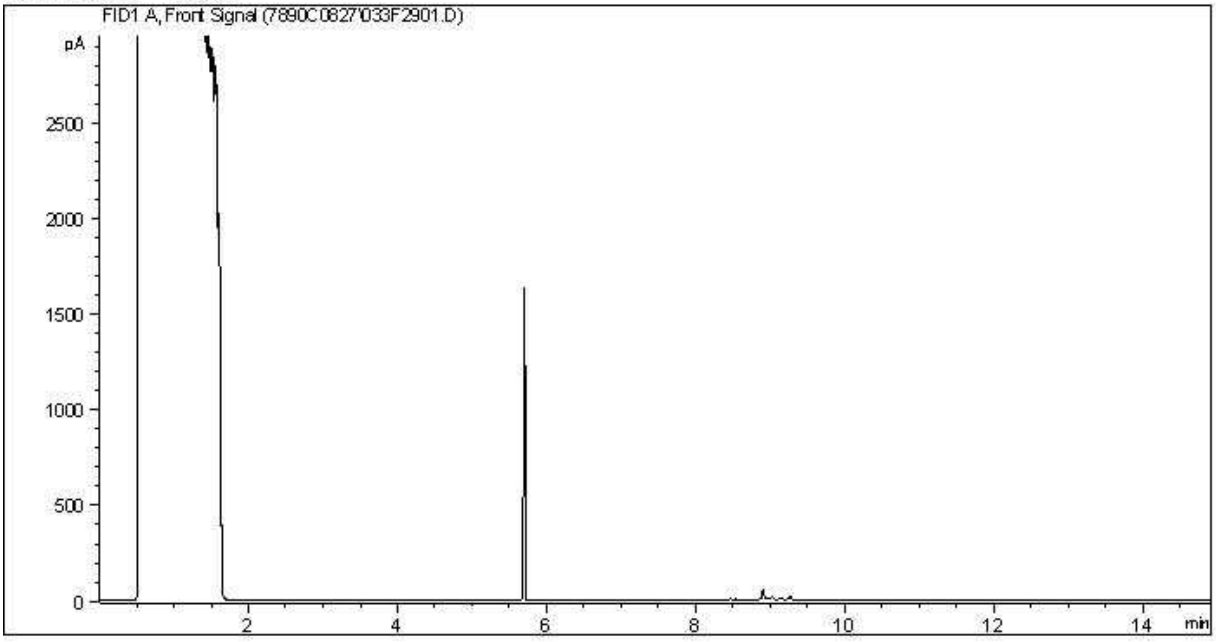
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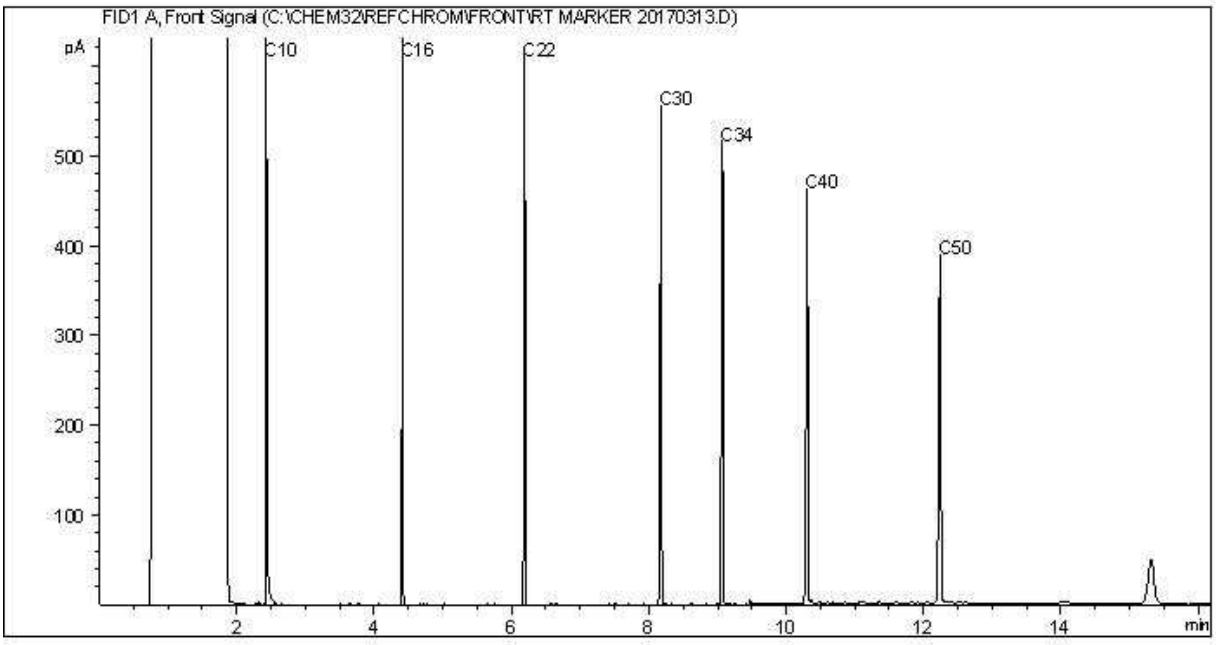
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



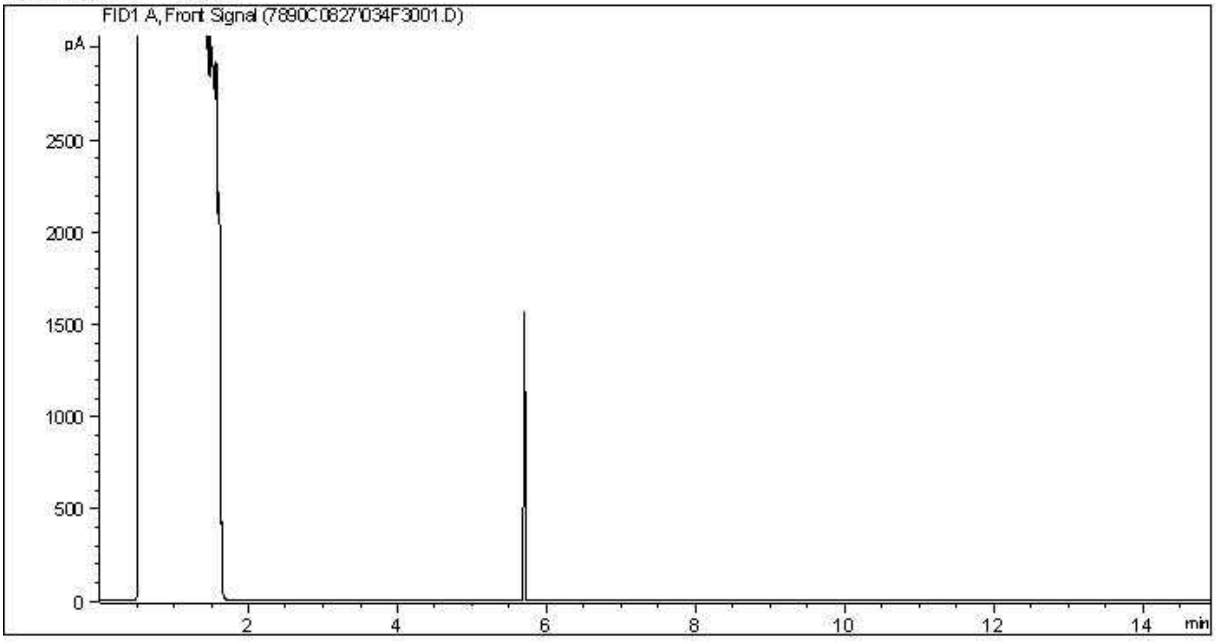
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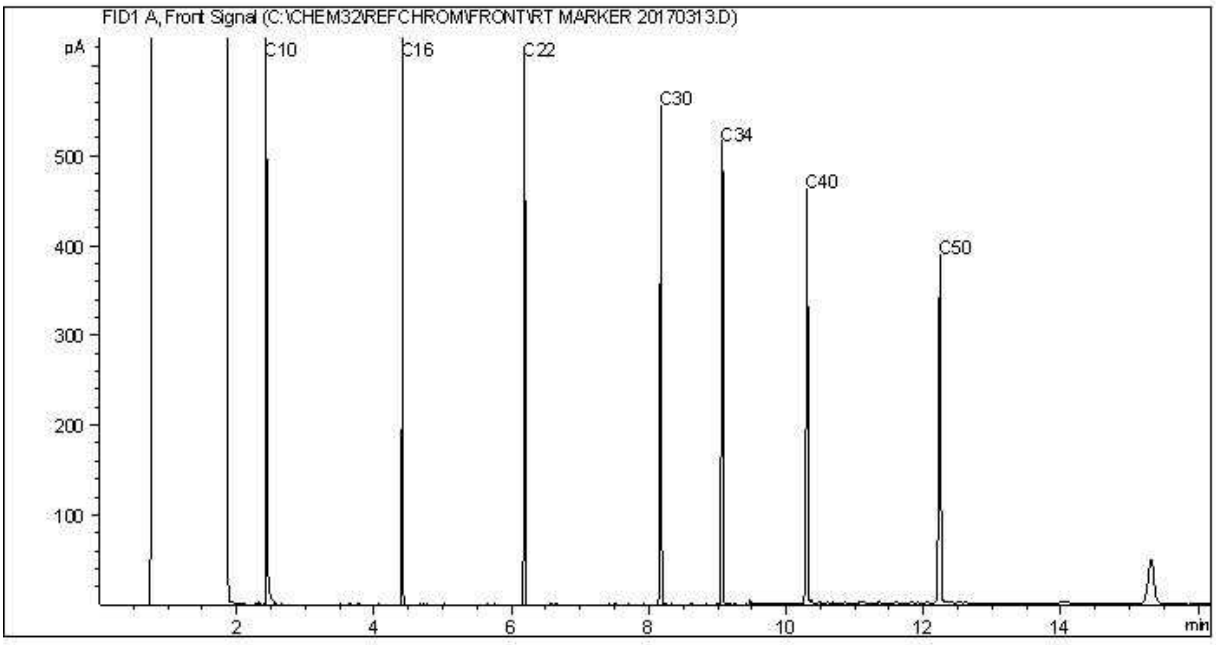
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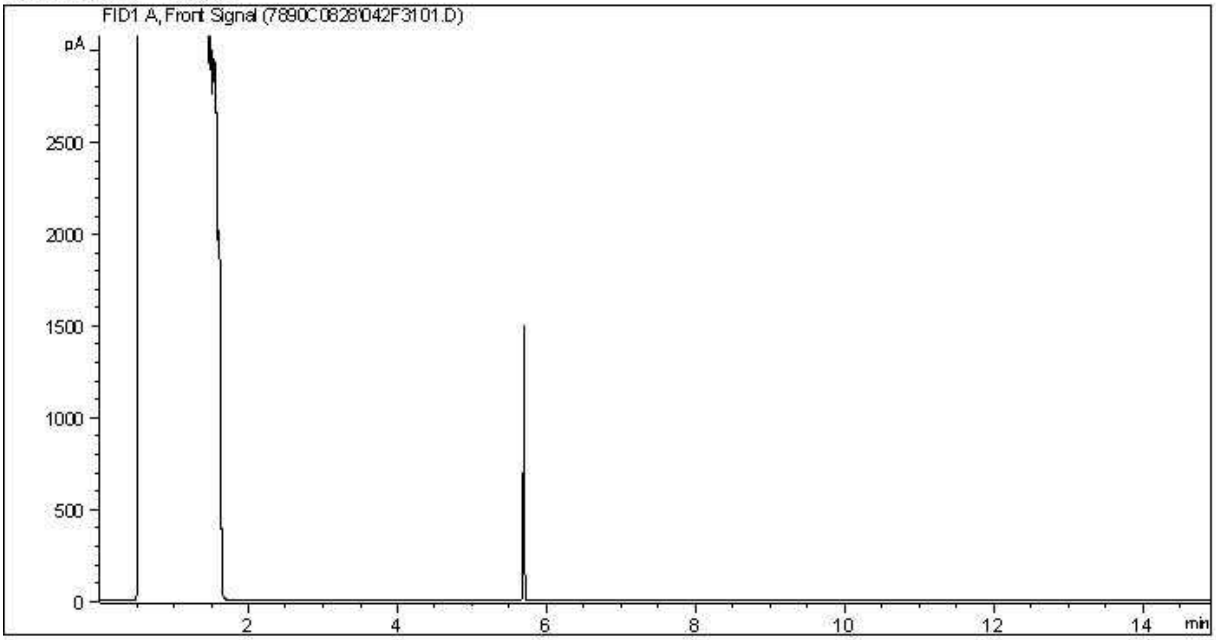
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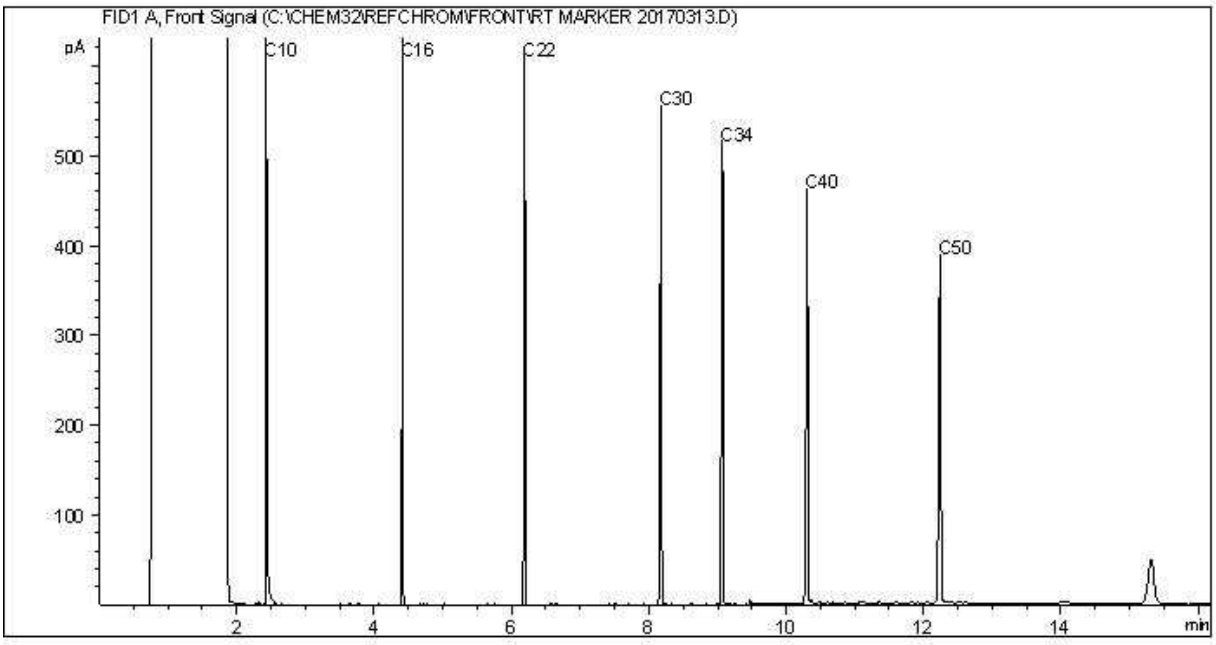
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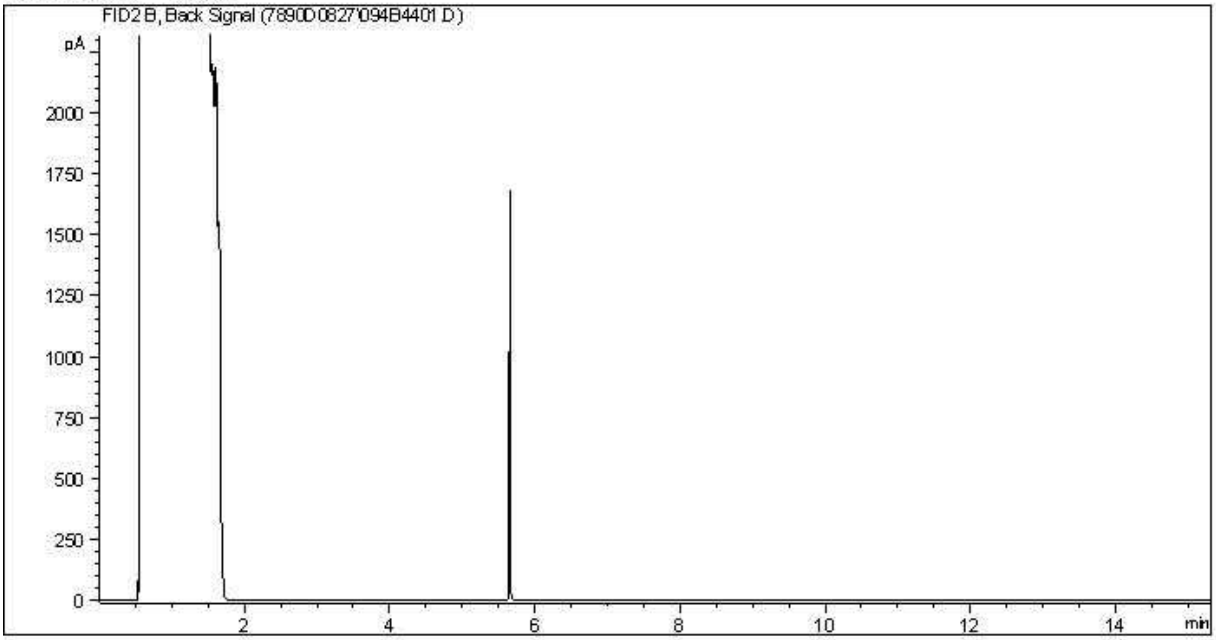
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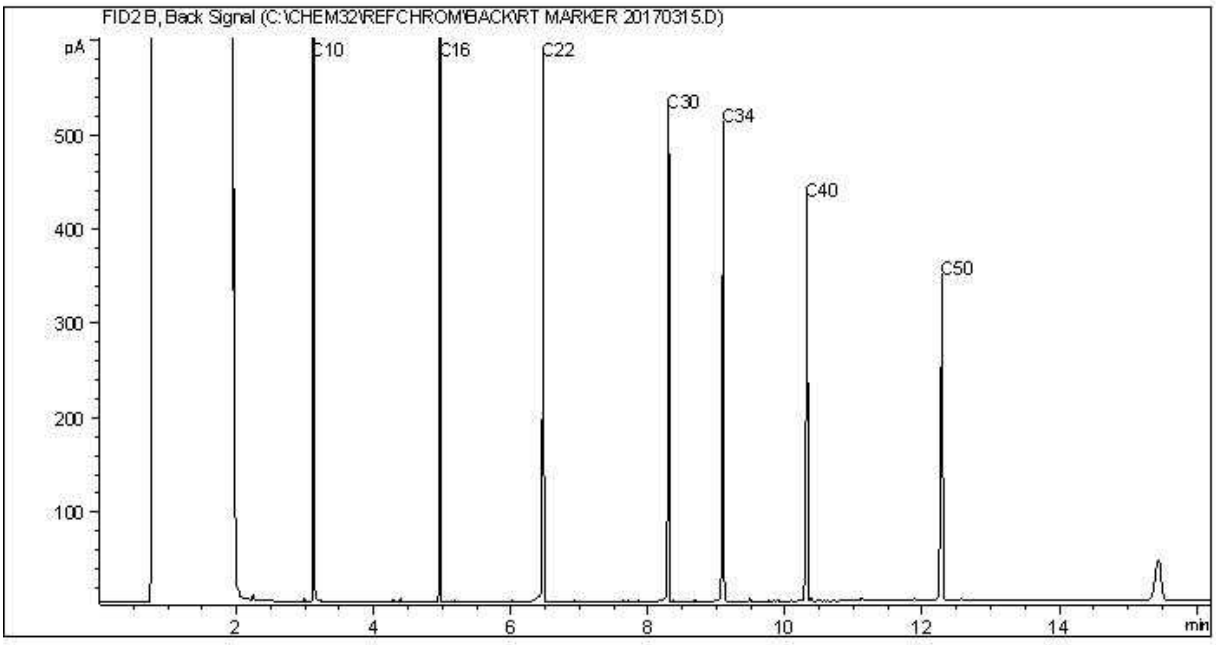
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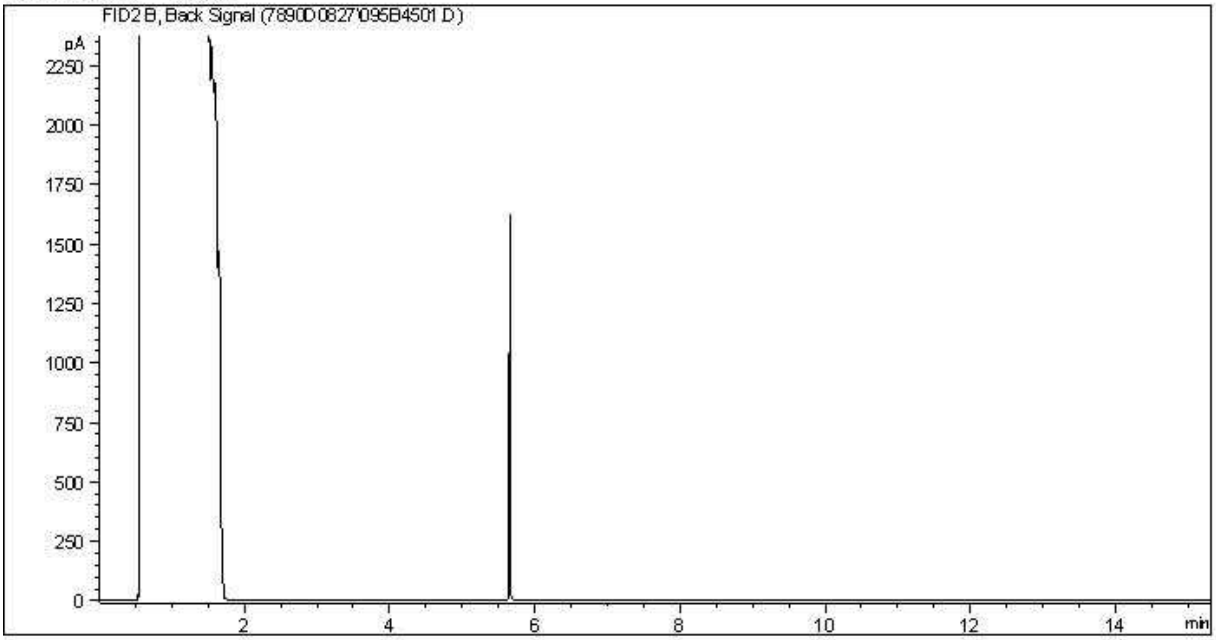
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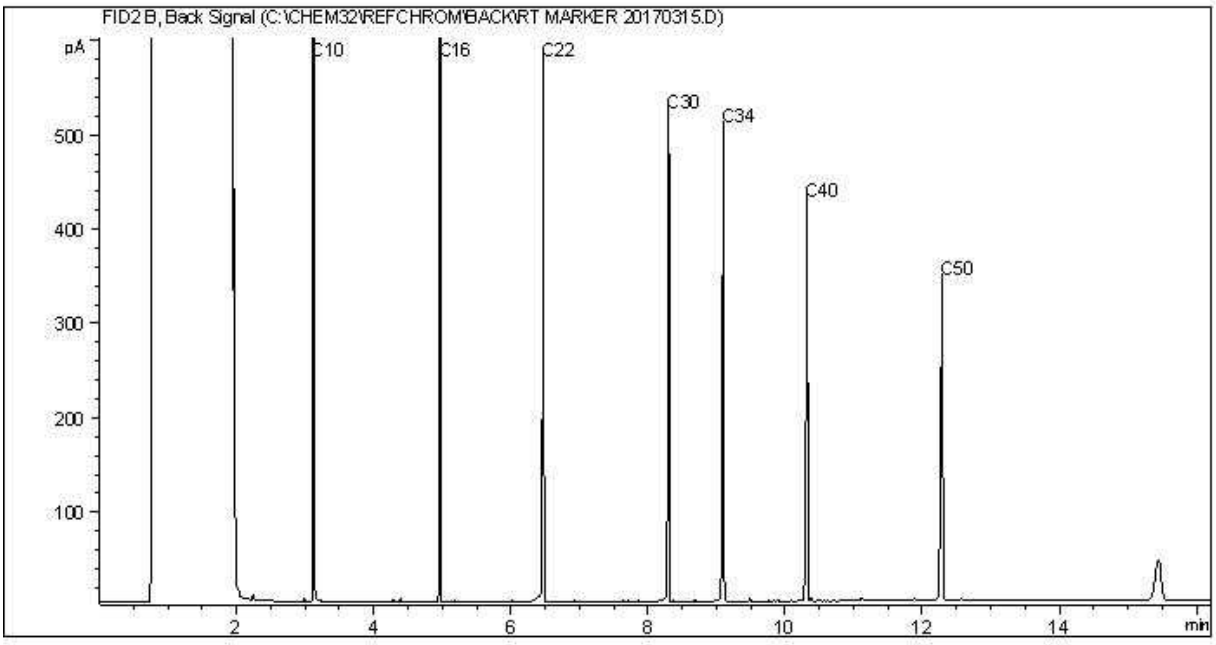
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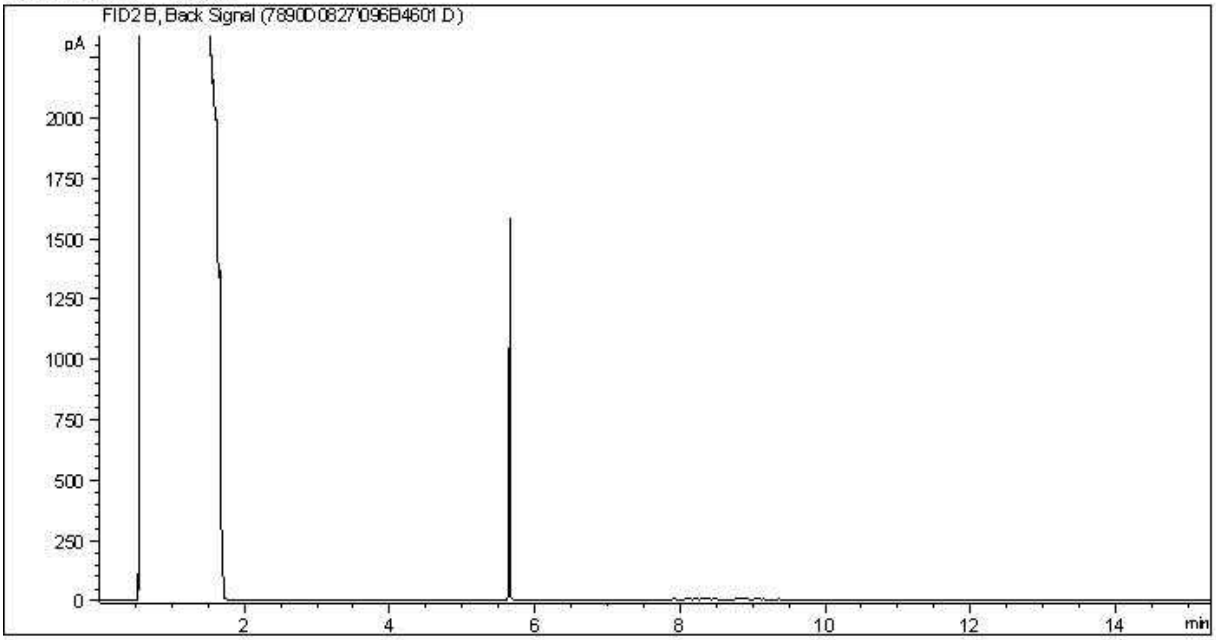
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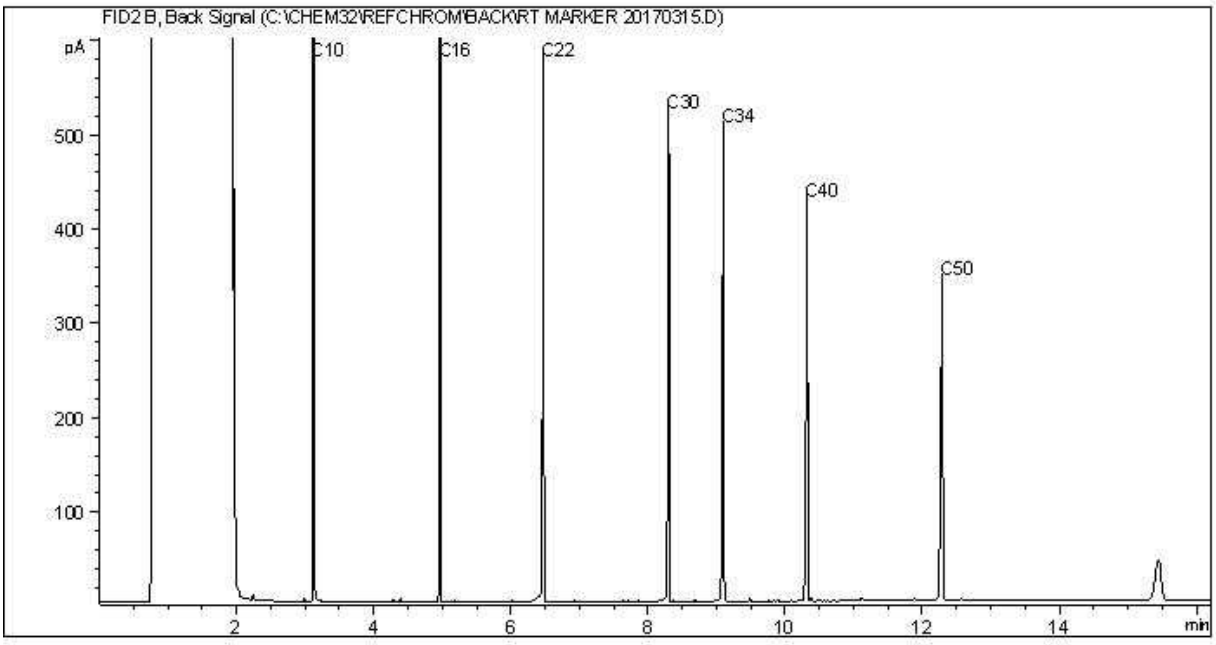
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Carbon Range Distribution - Reference Chromatogram



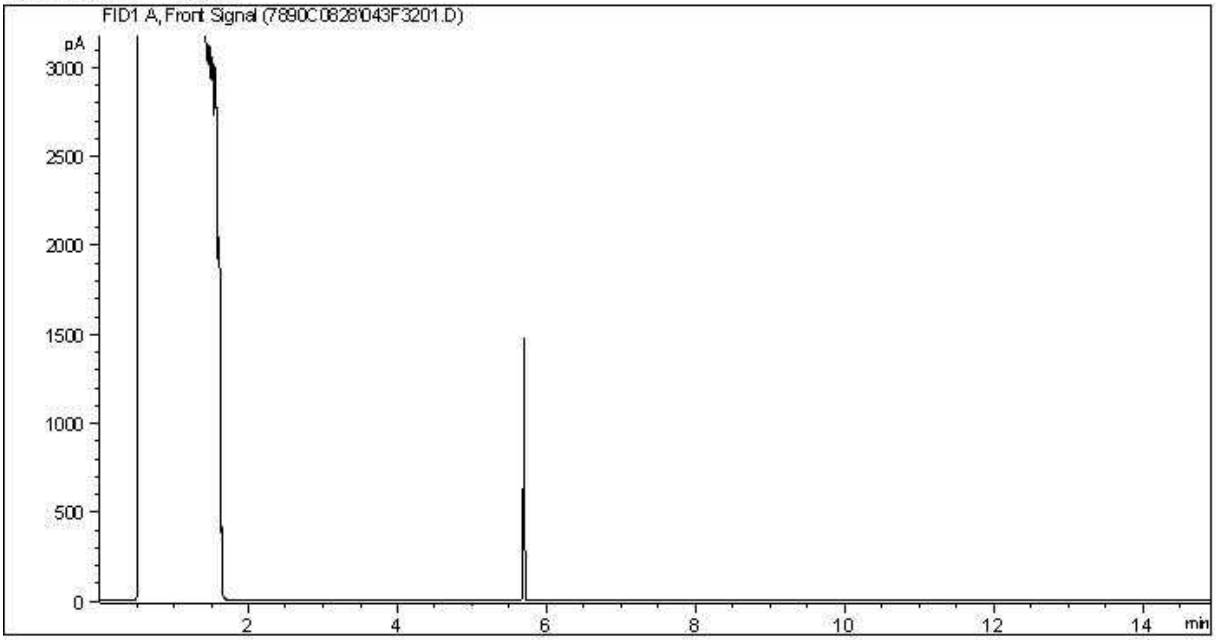
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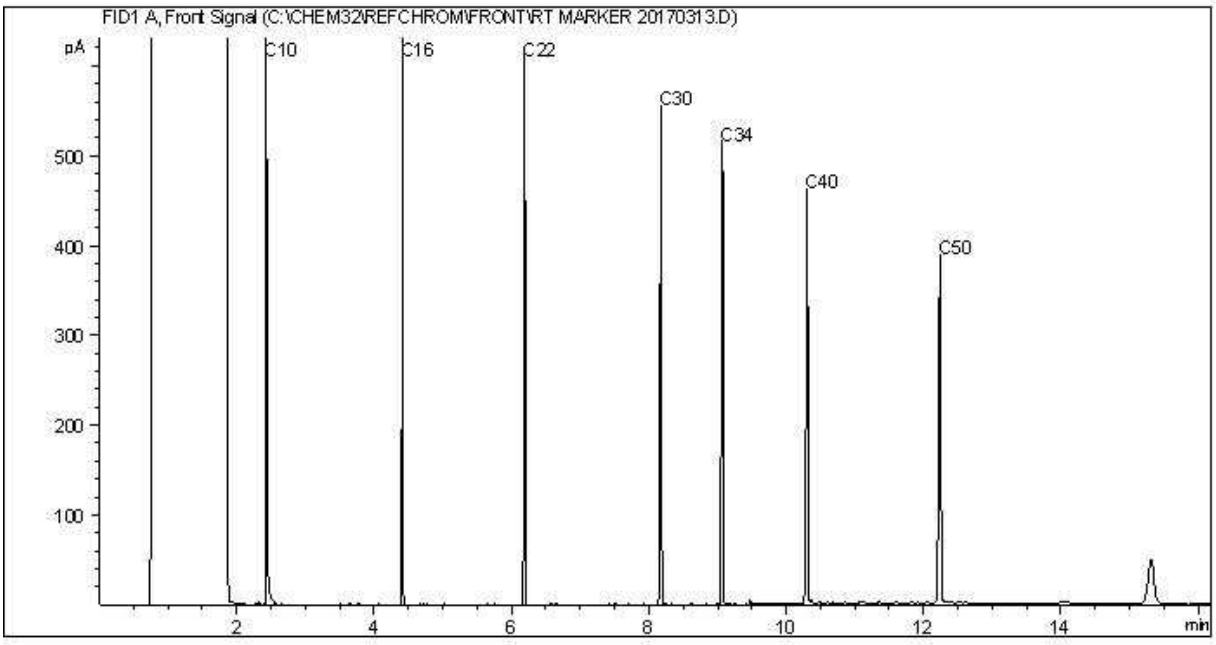
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



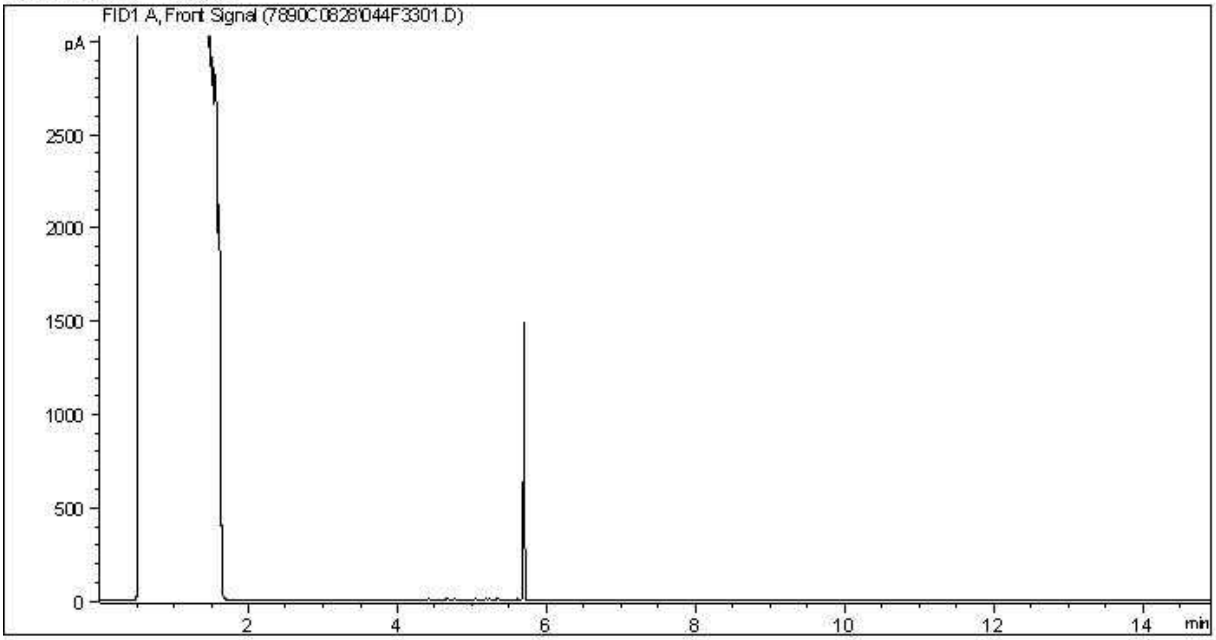
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
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Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

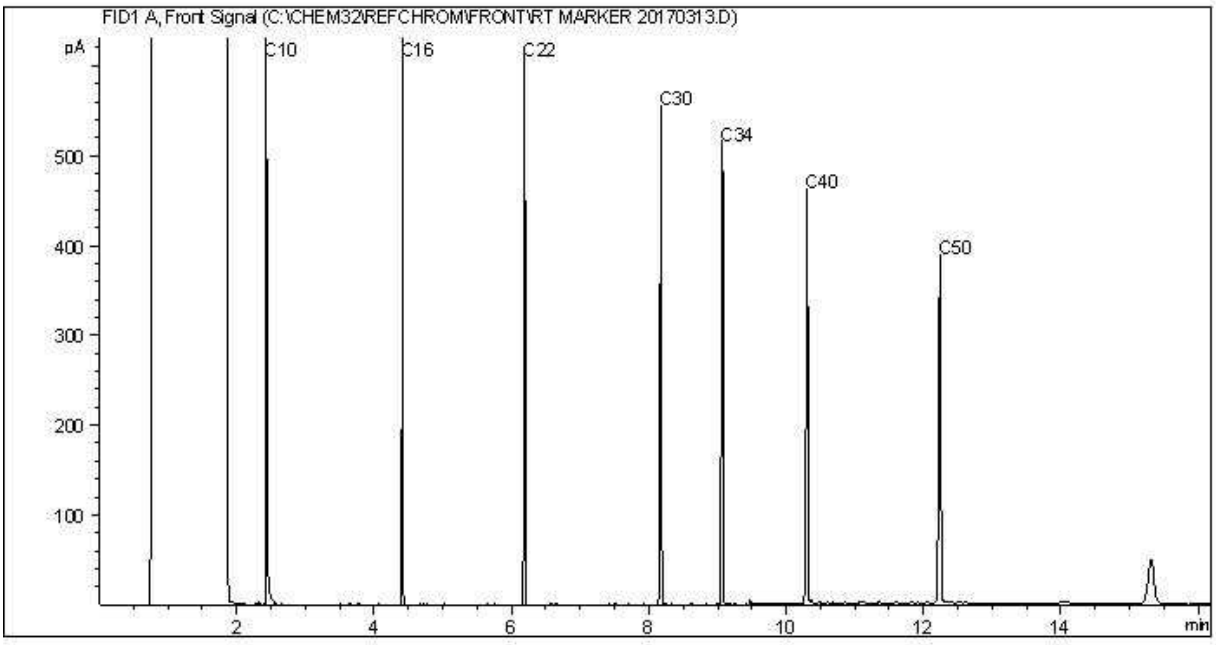
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



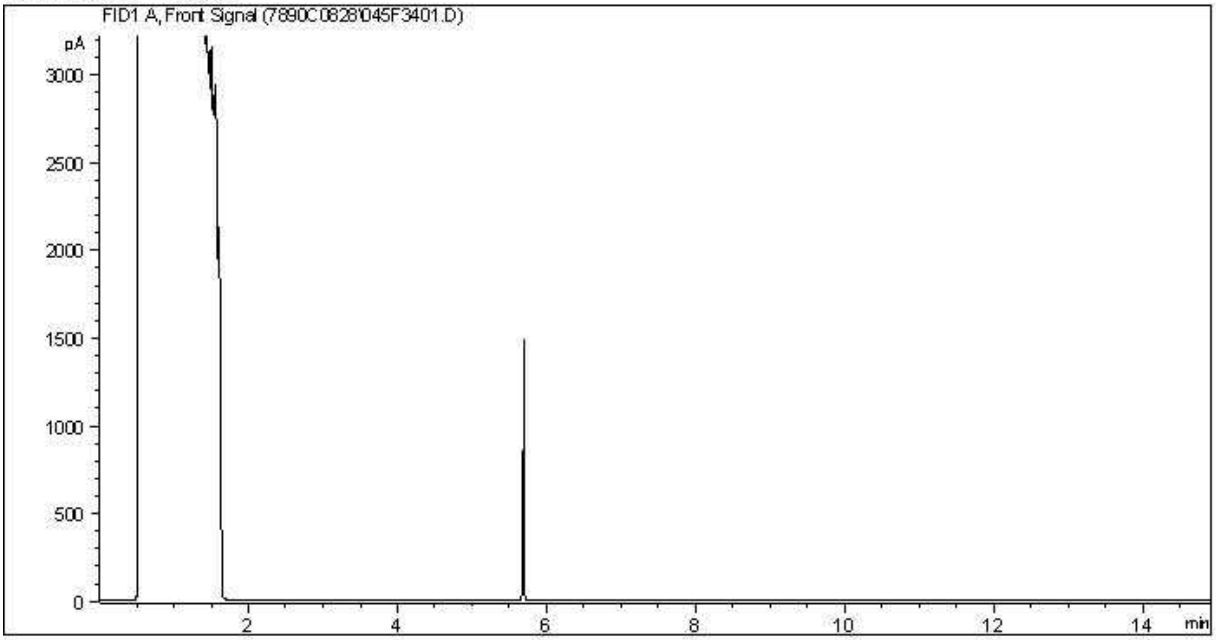
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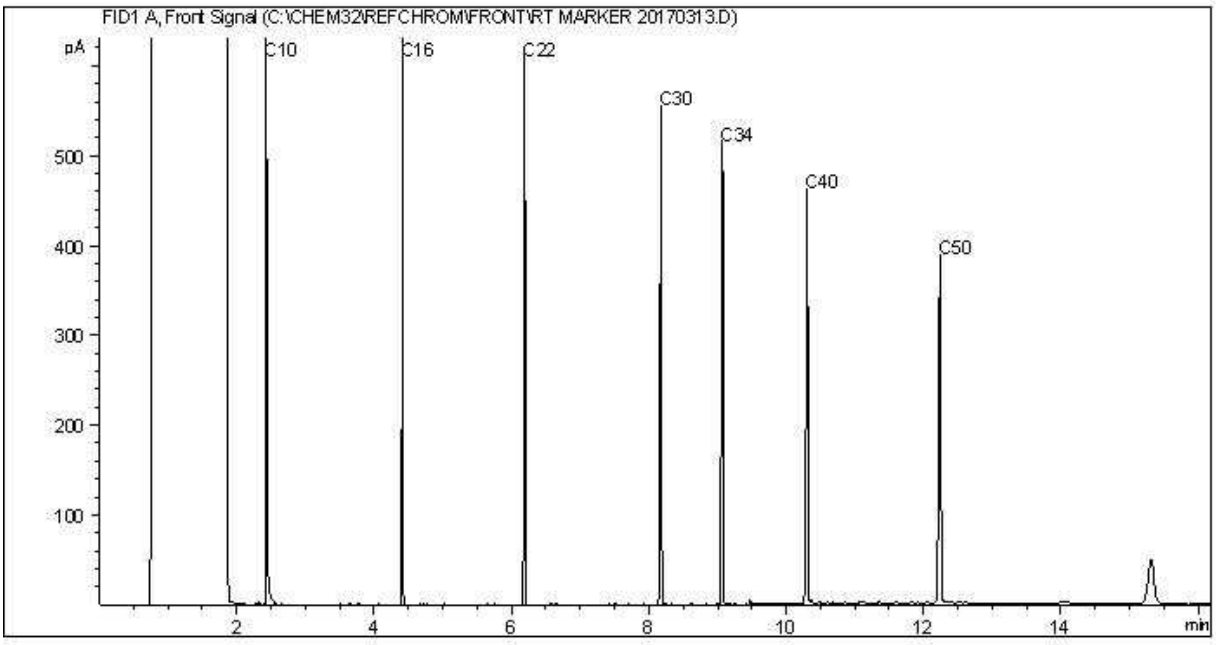
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



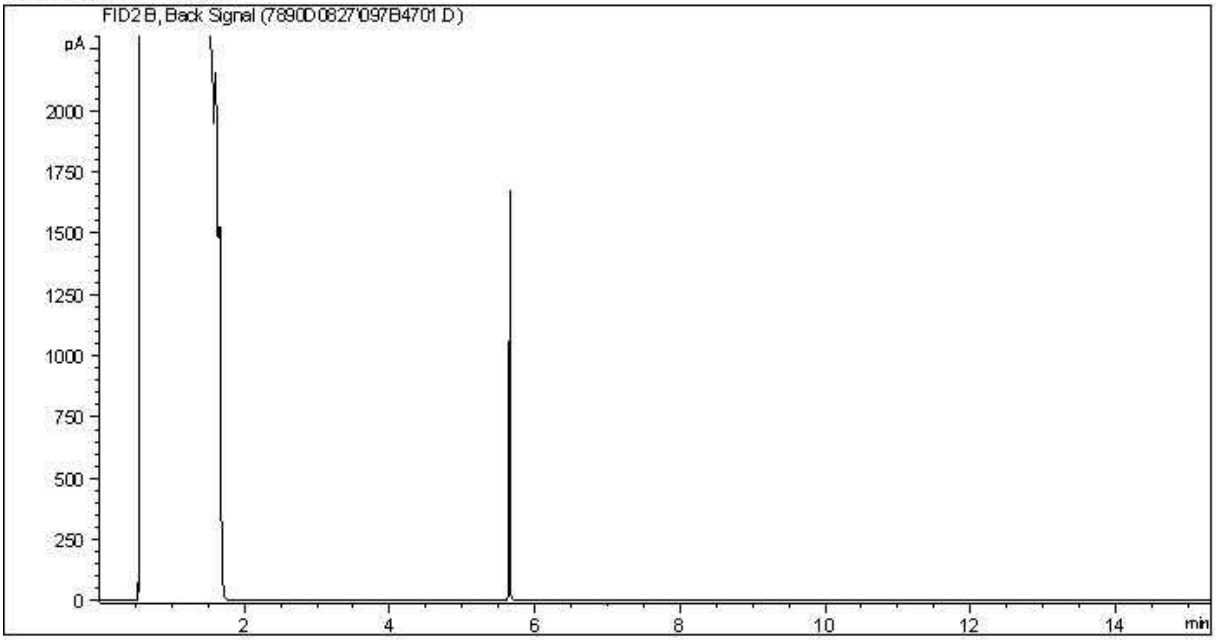
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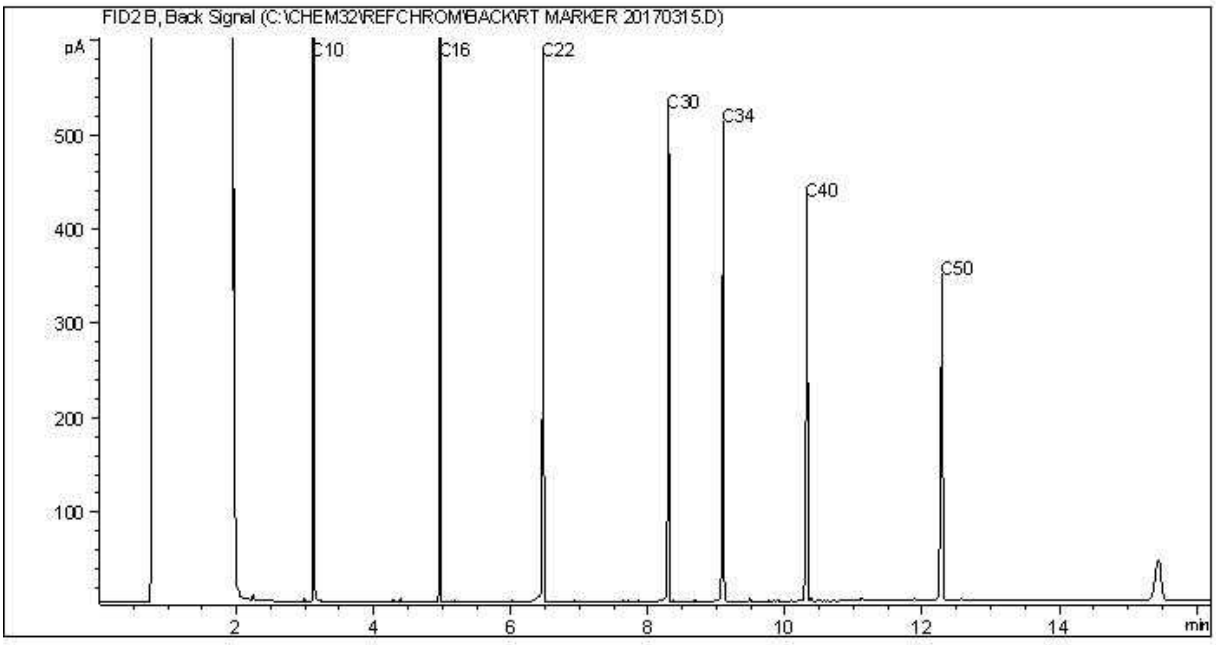
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



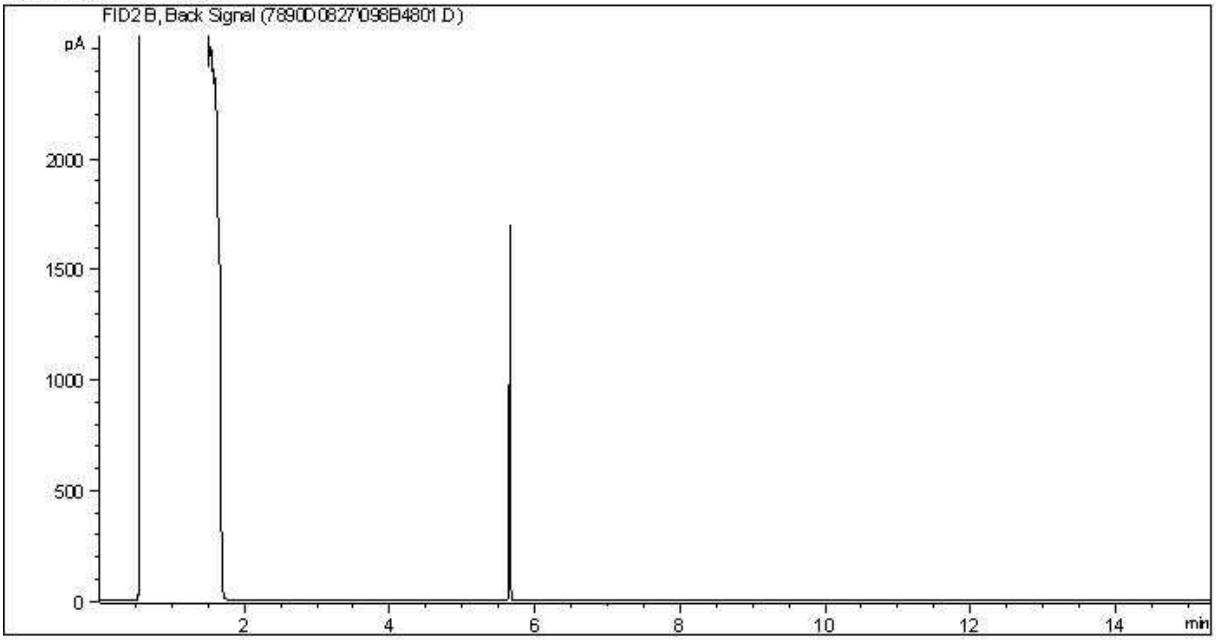
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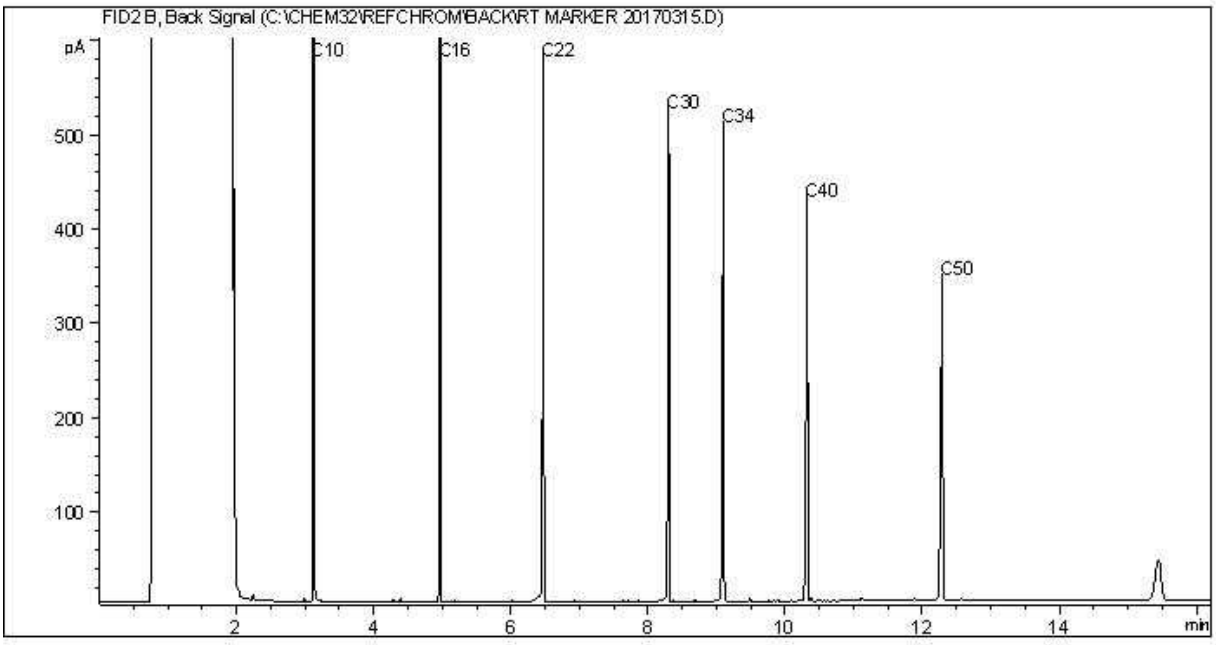
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



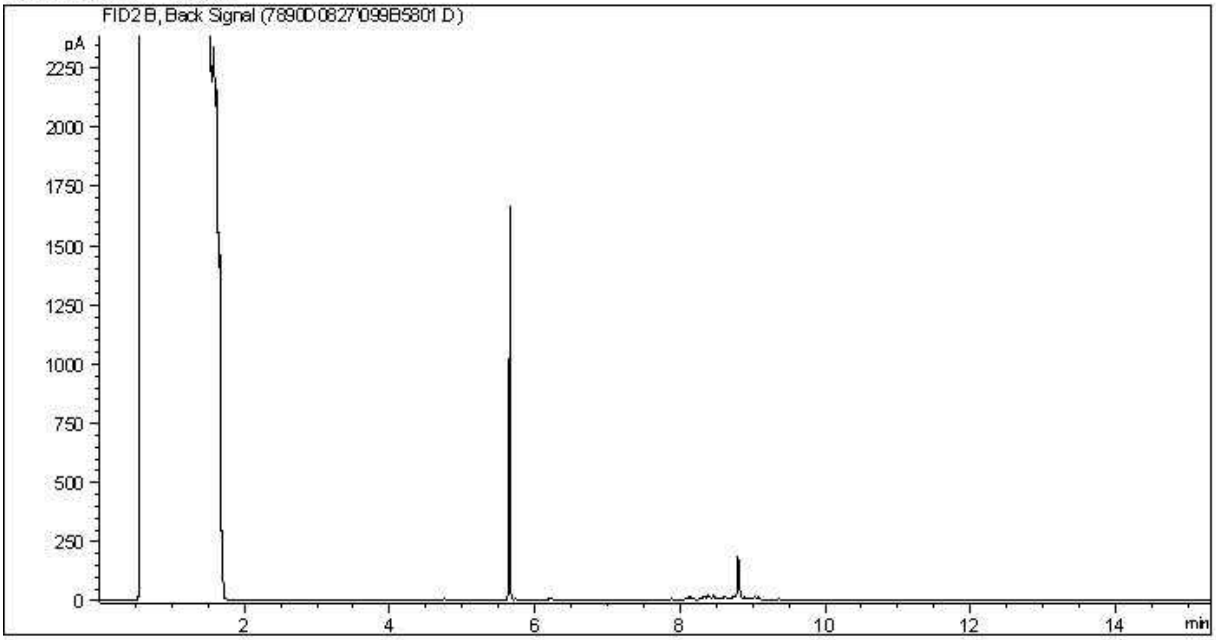
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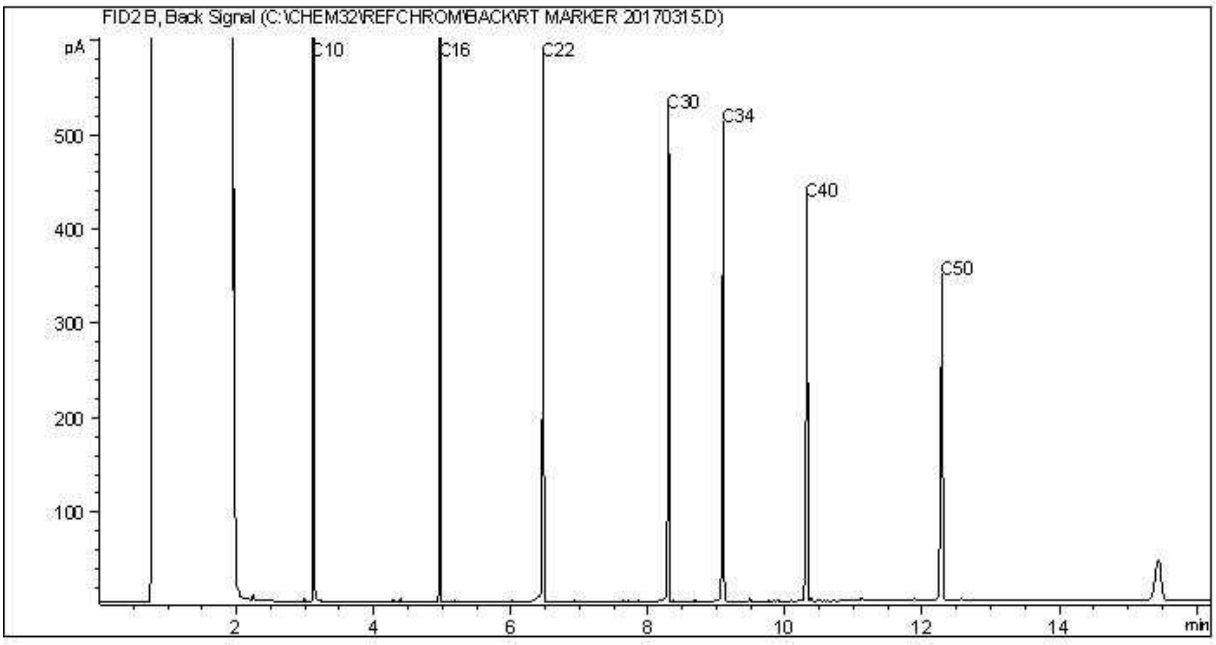
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



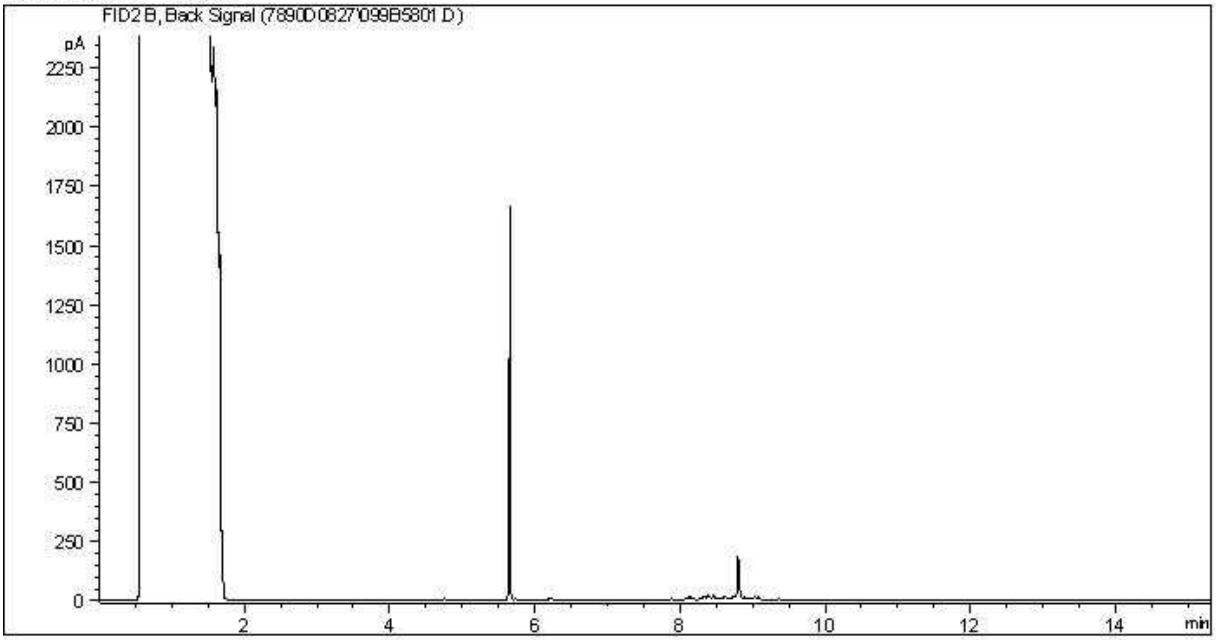
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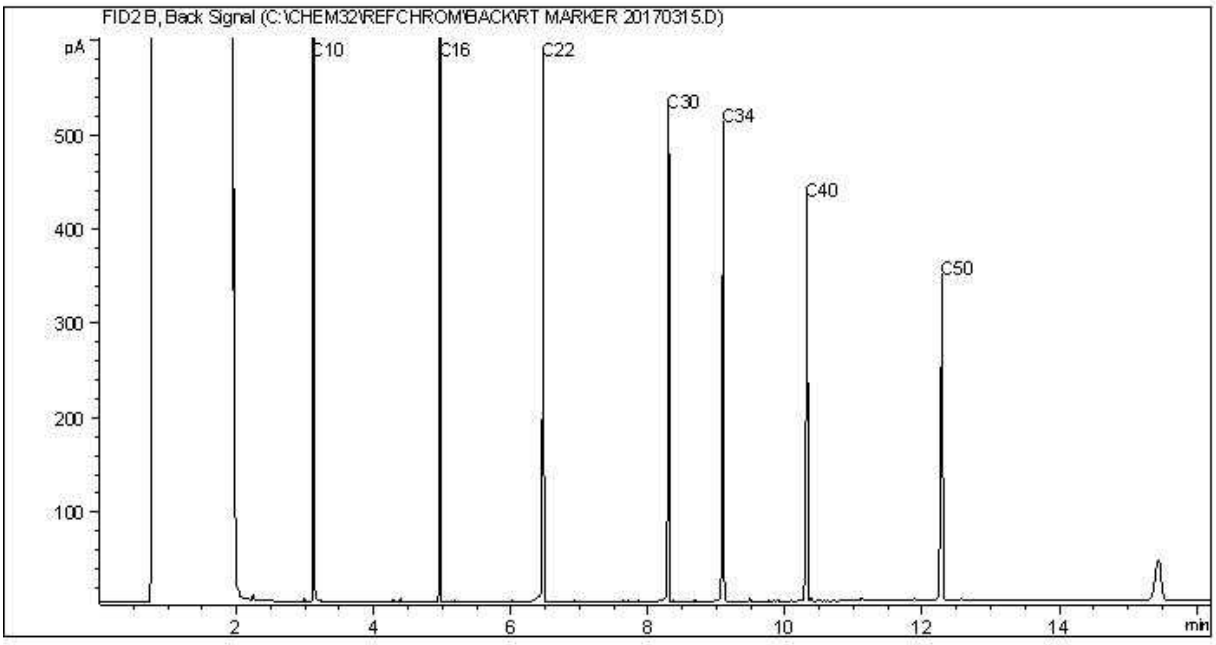
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CCME Hydrocarbons (F2-F4)+F3A/B in soil Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



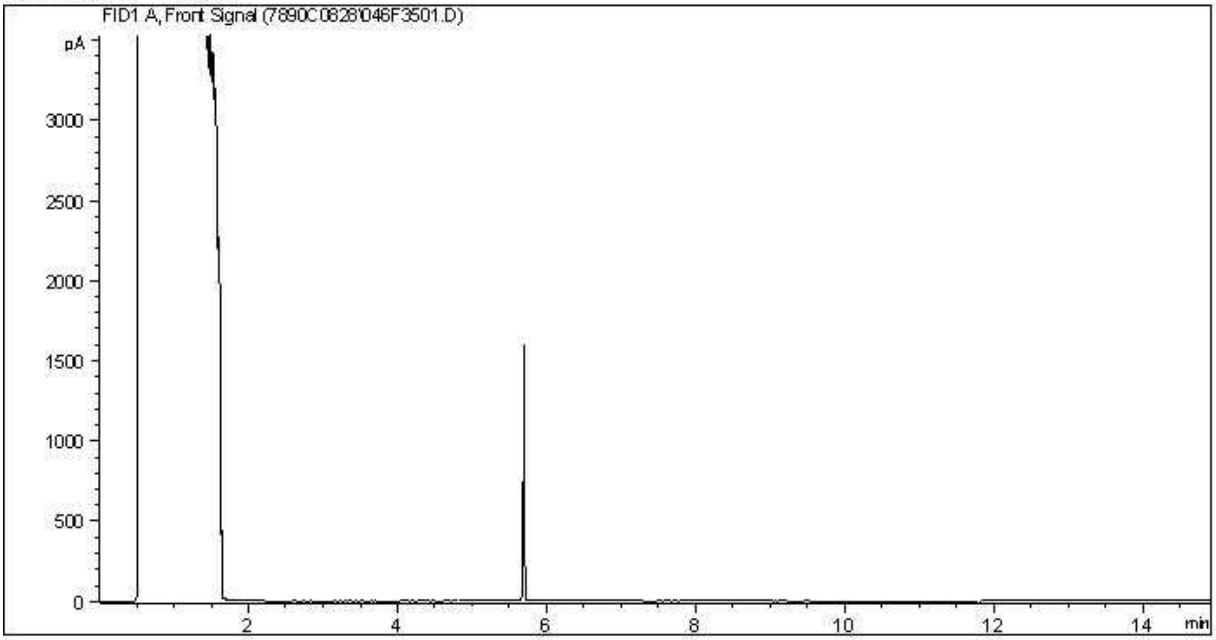
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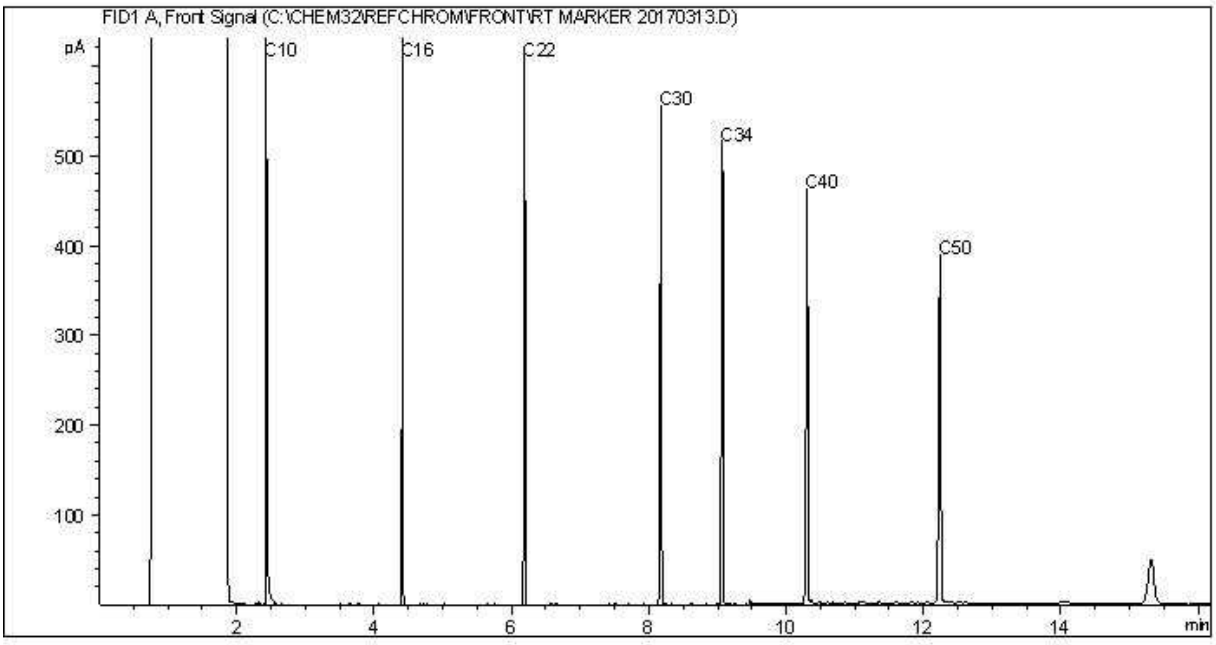
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



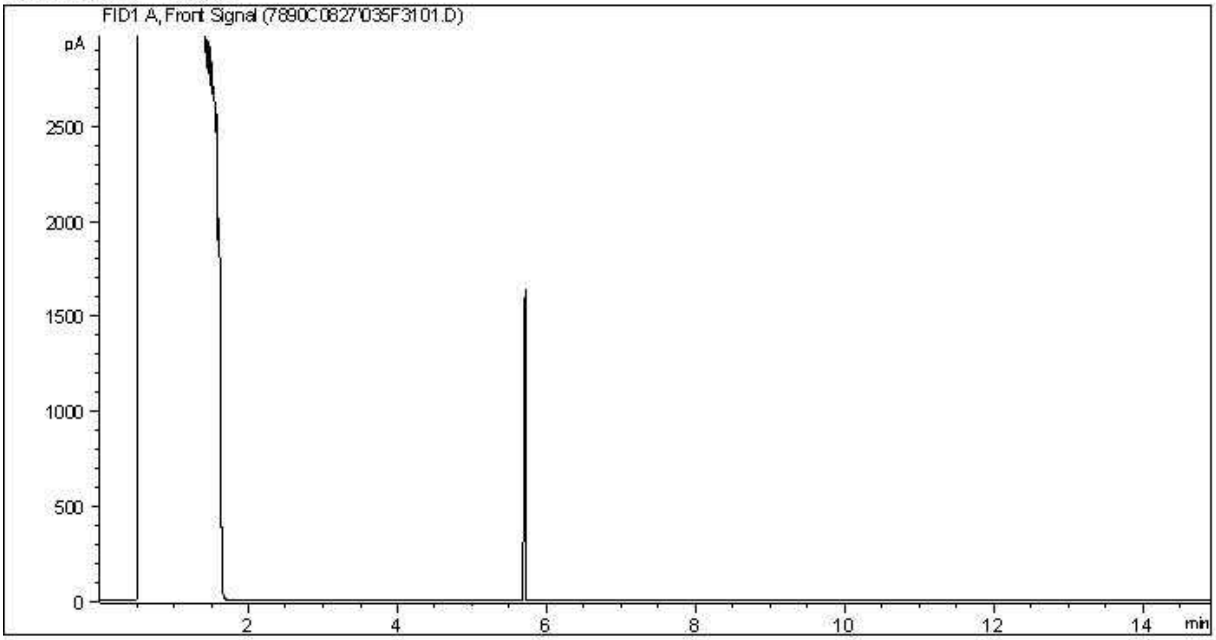
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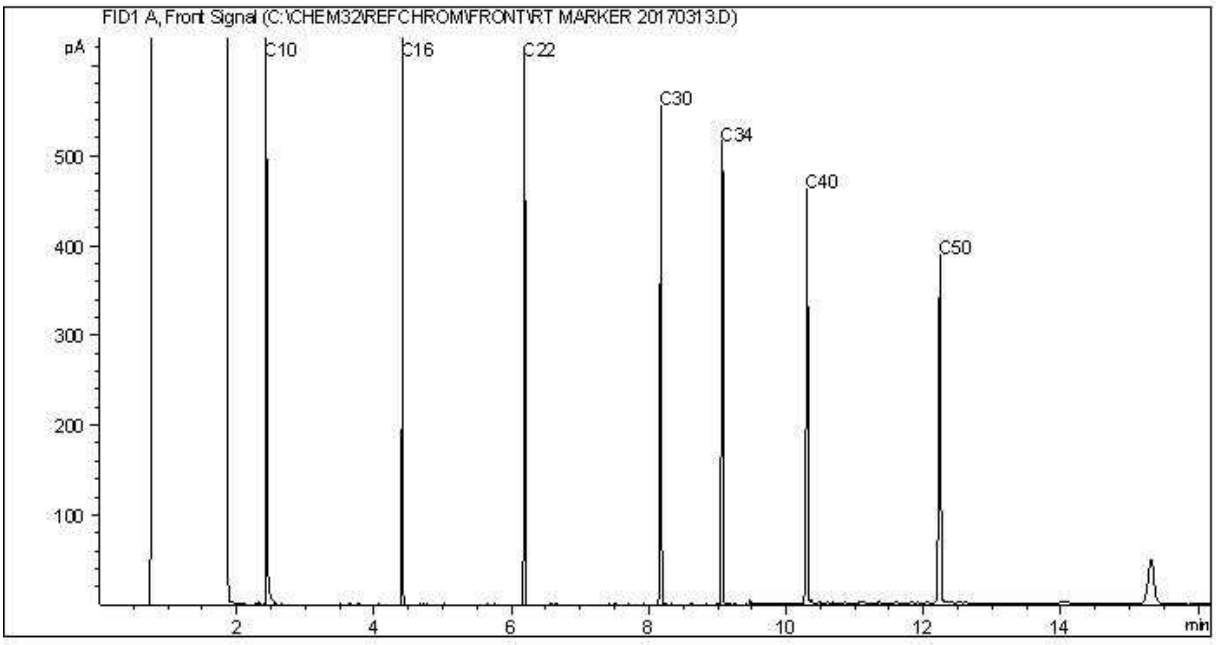
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



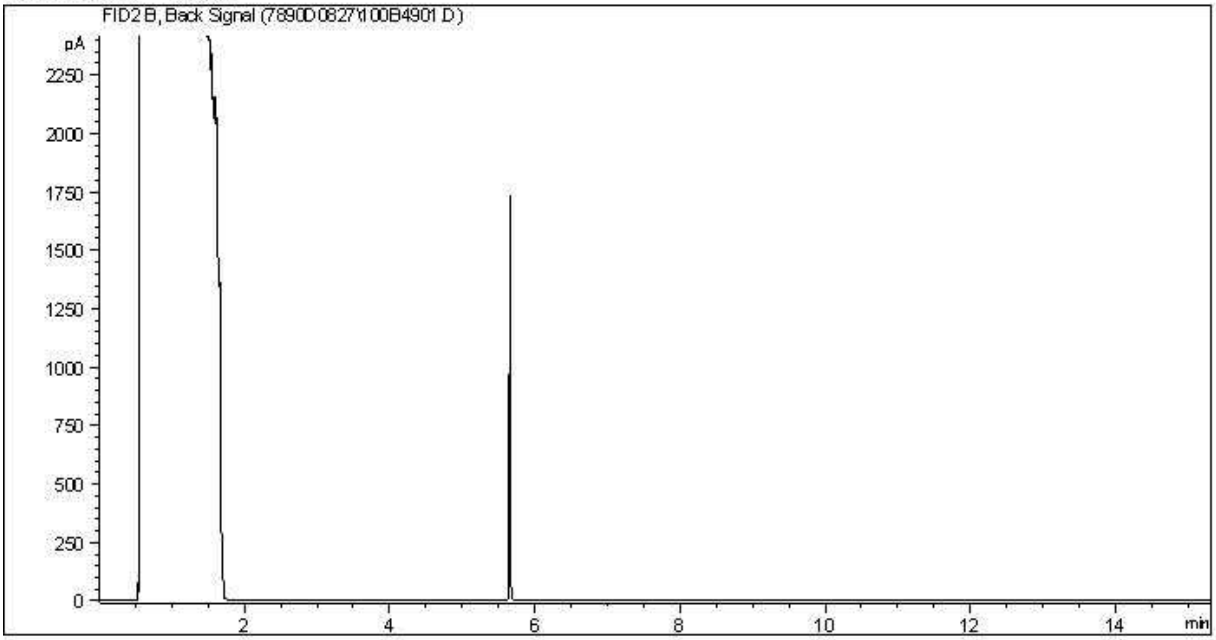
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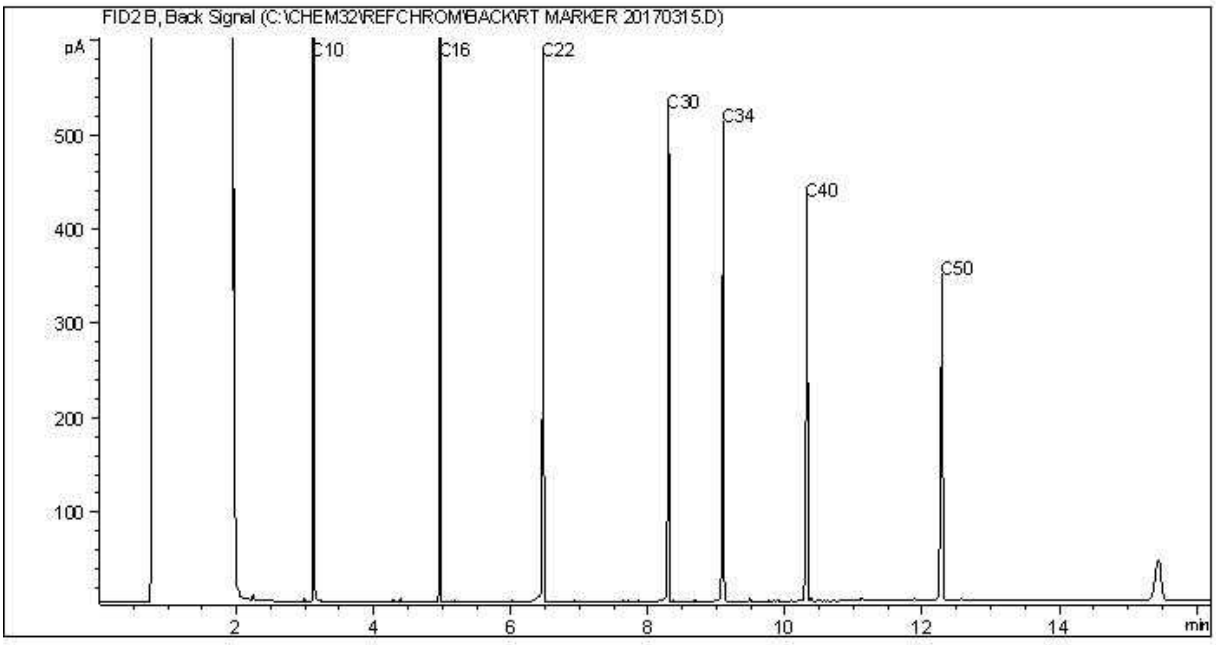
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



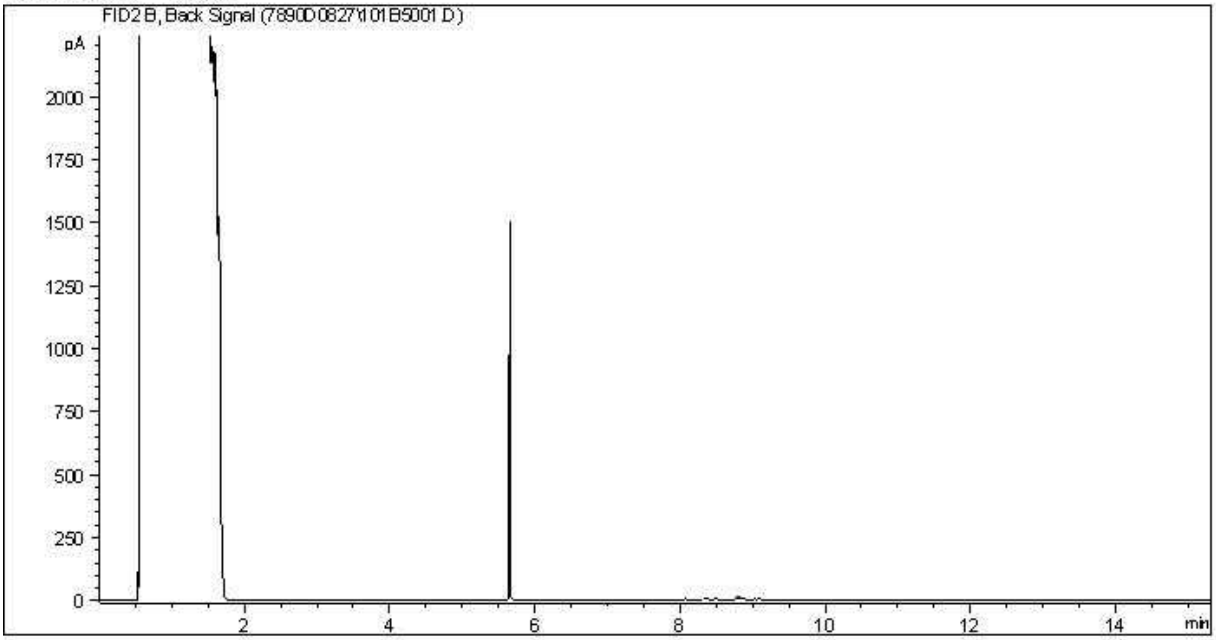
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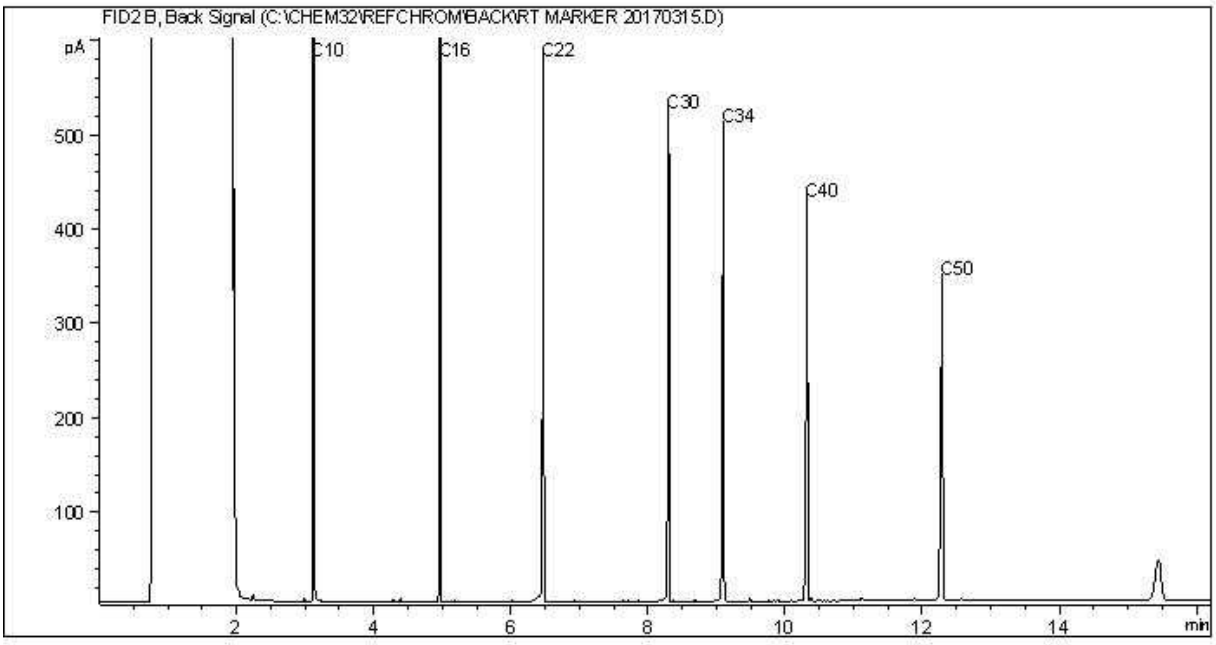
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



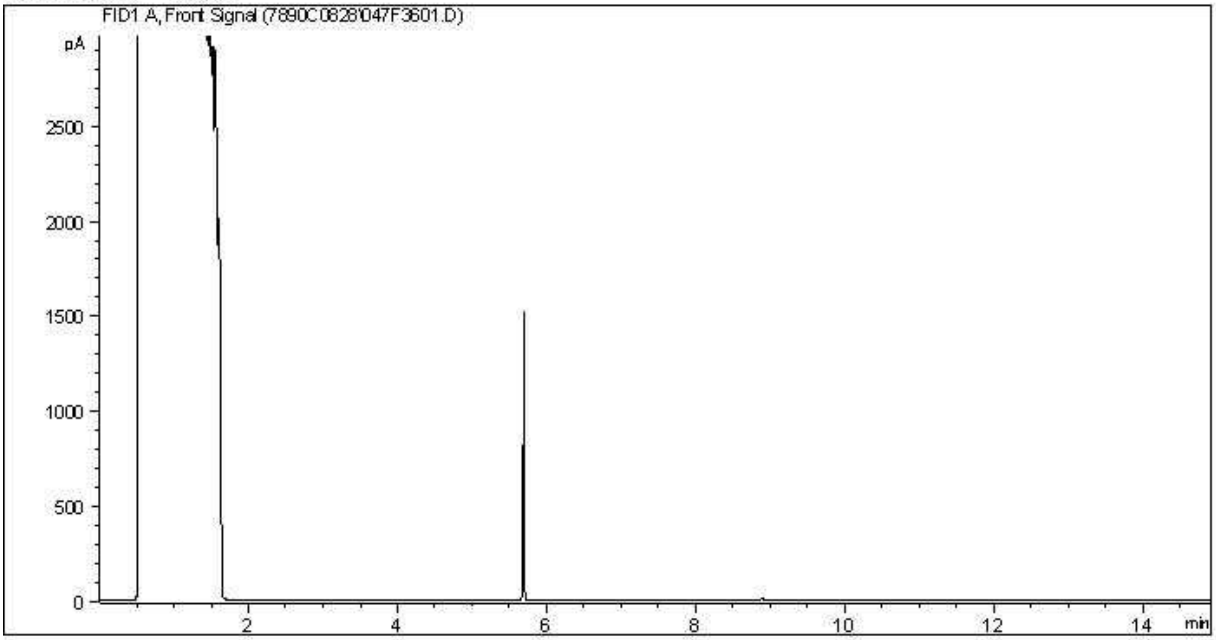
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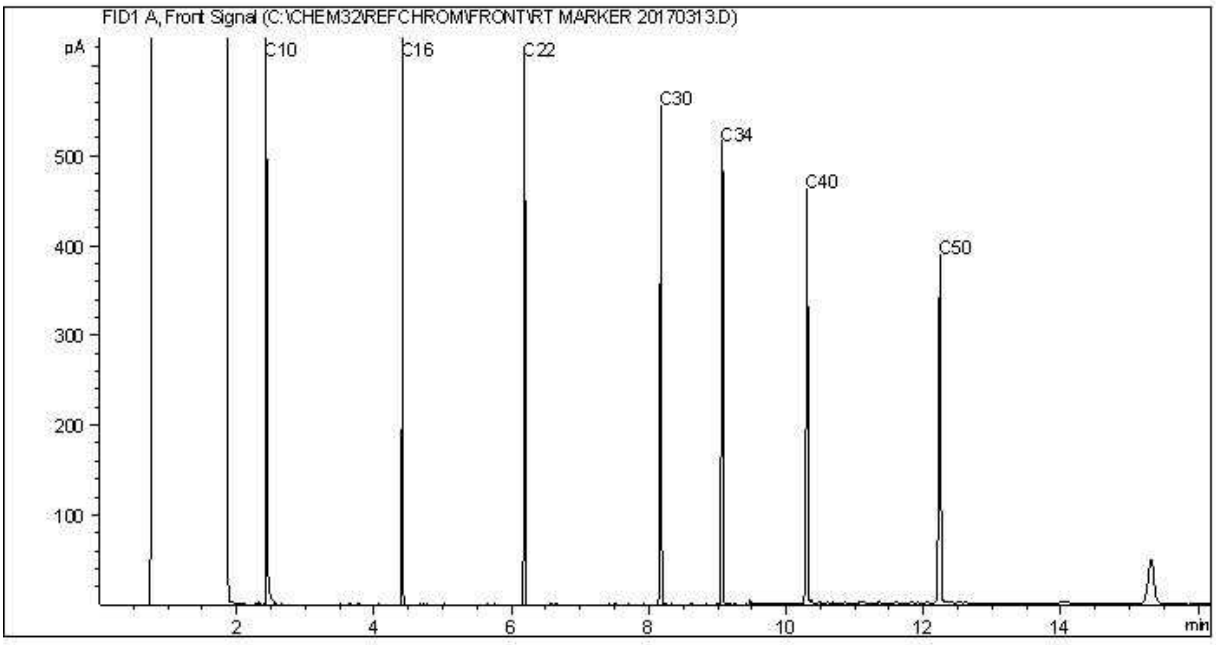
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



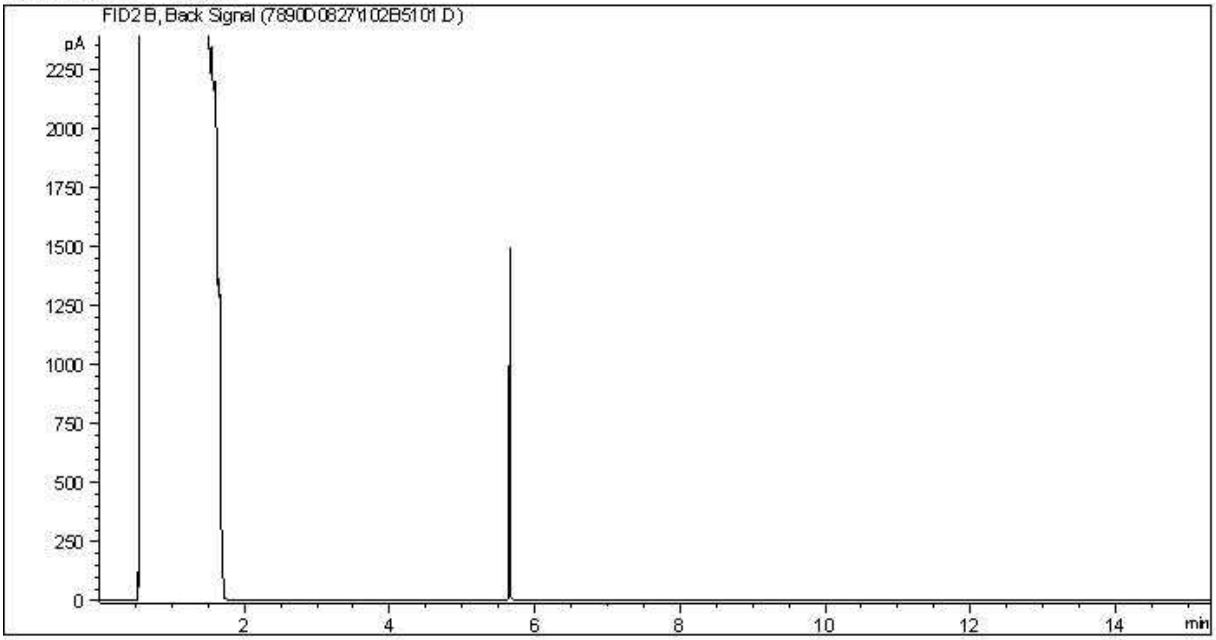
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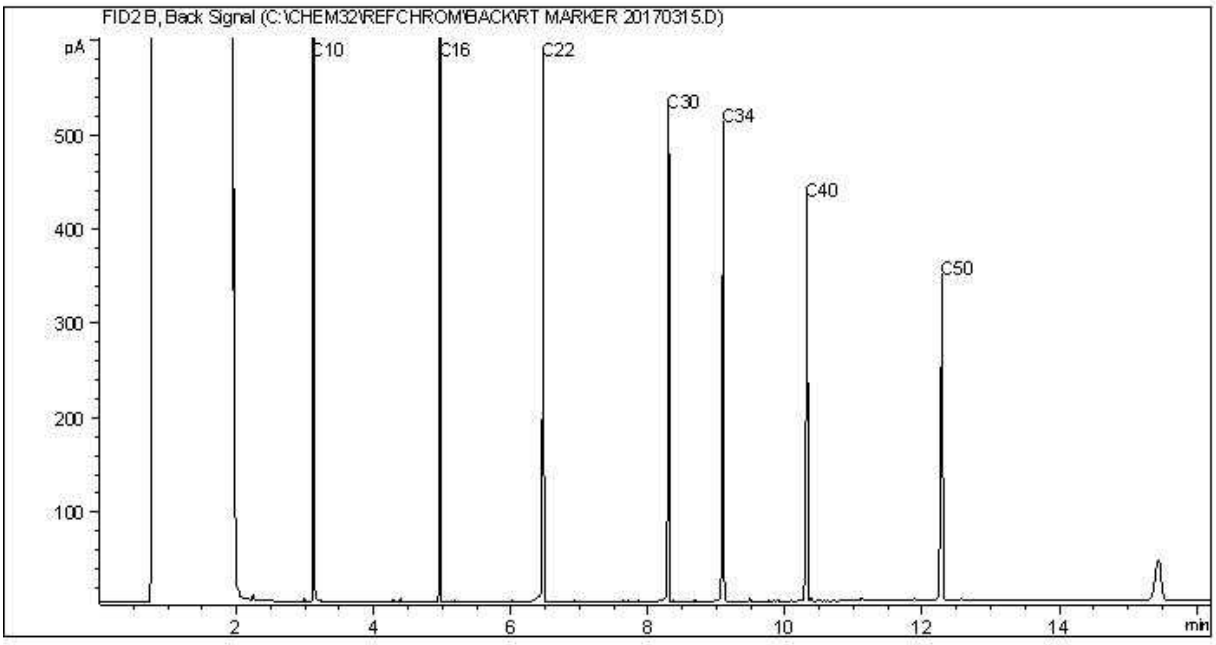
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



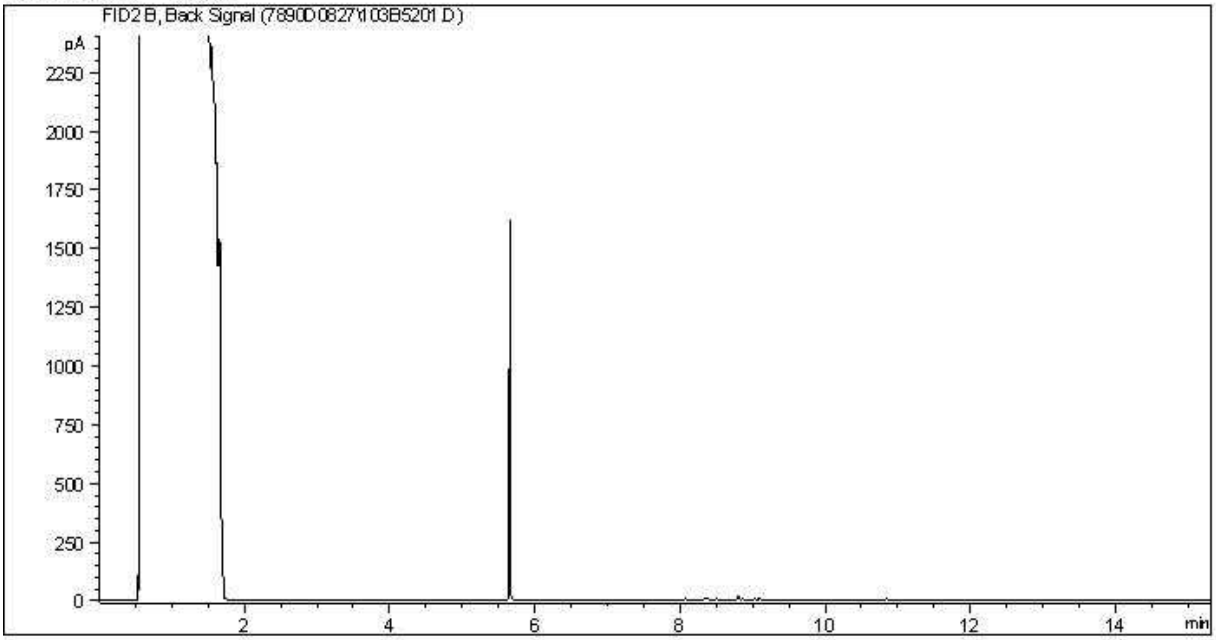
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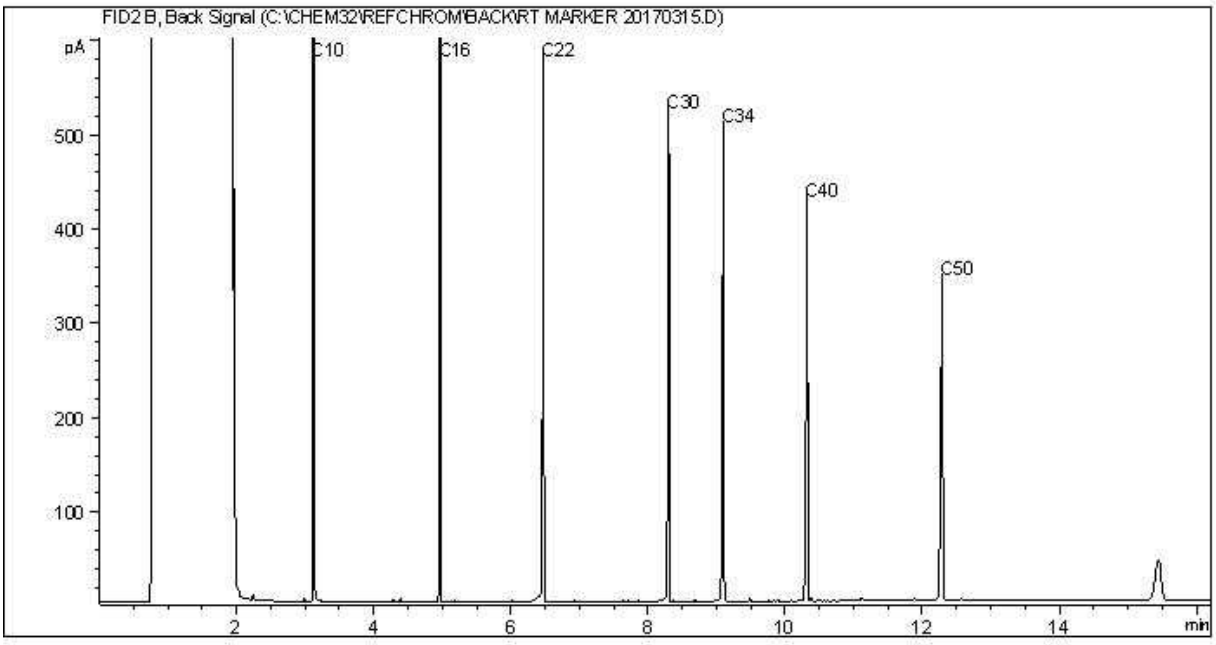
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



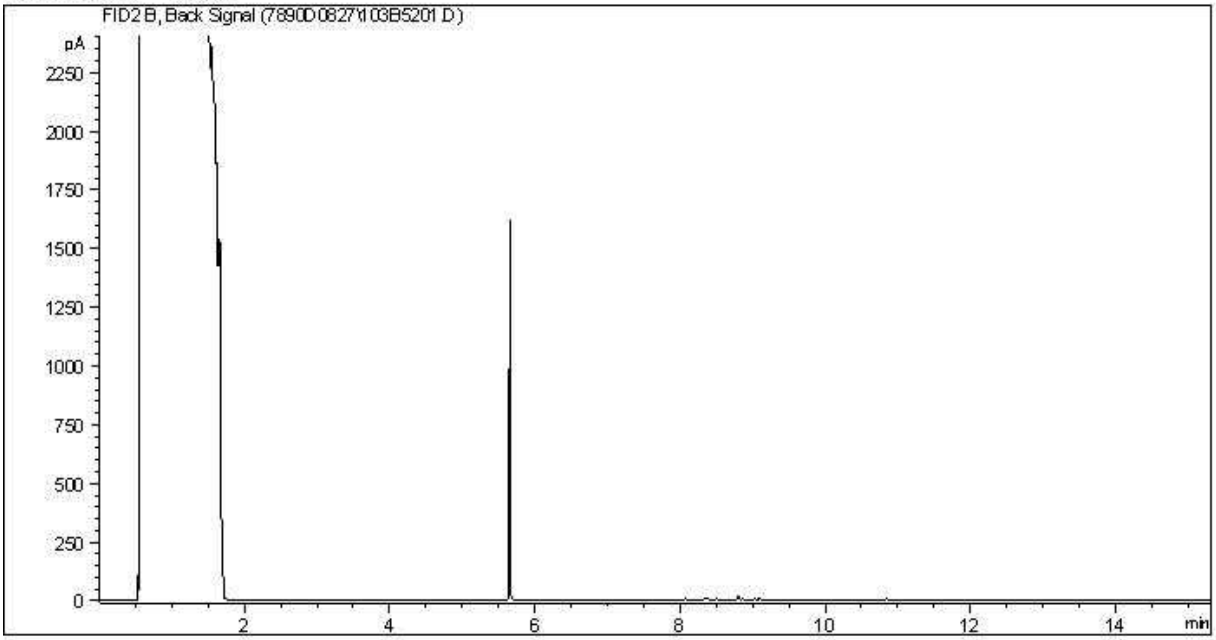
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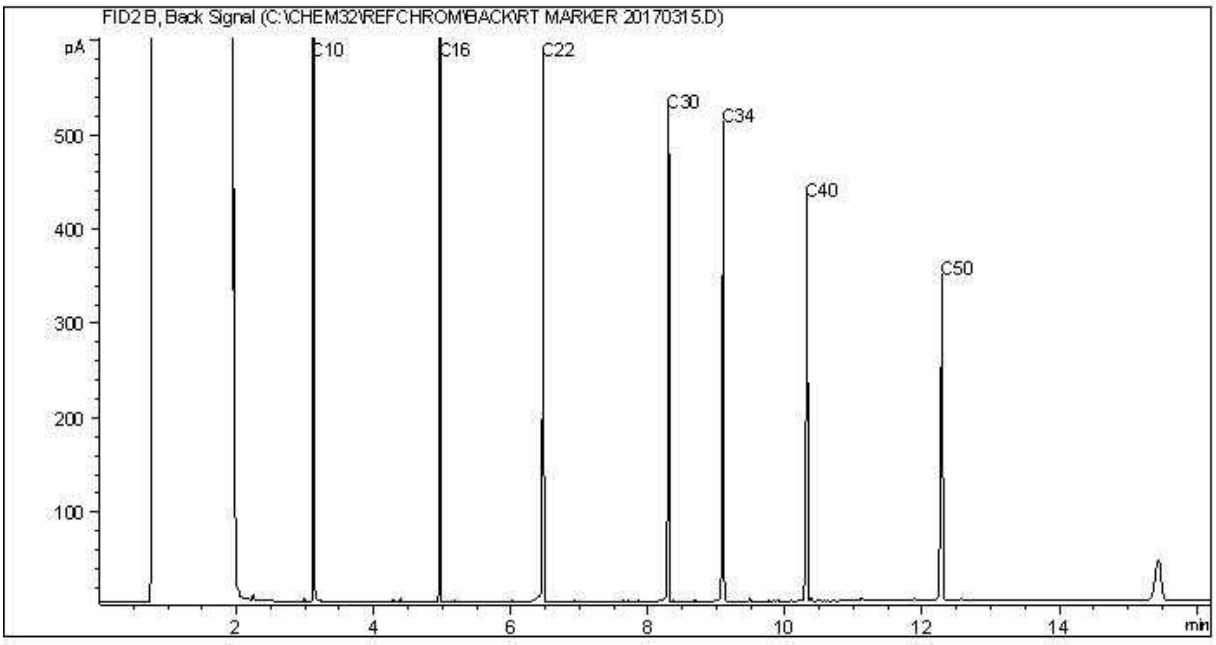
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CCME Hydrocarbons (F2-F4)+F3A/B in soil Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



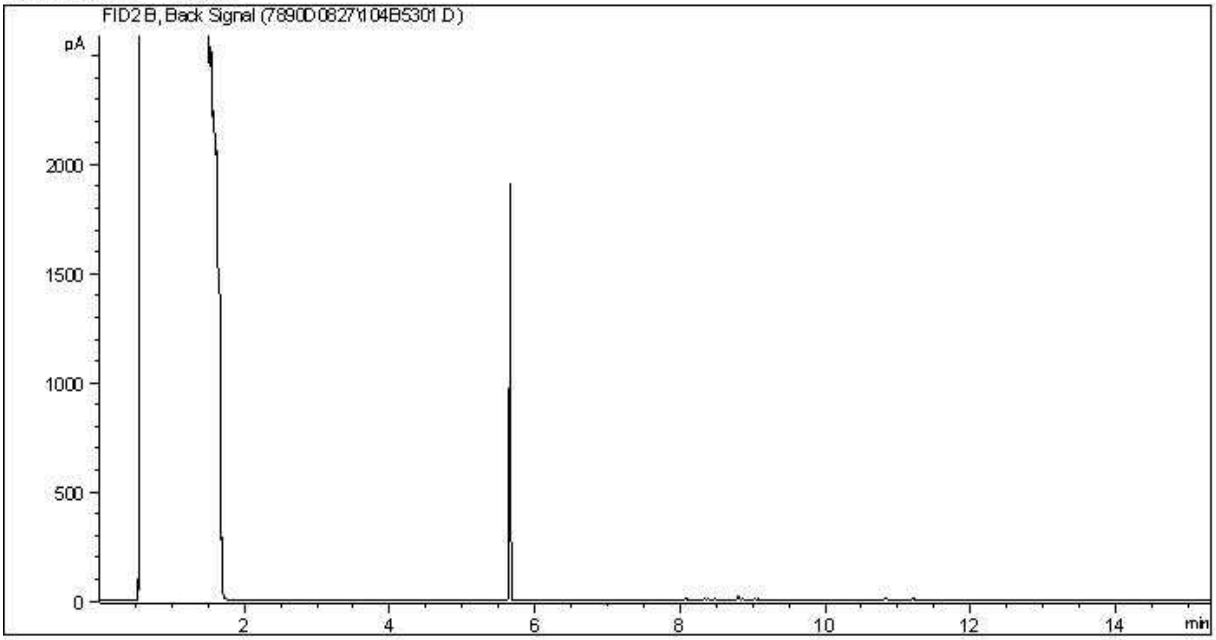
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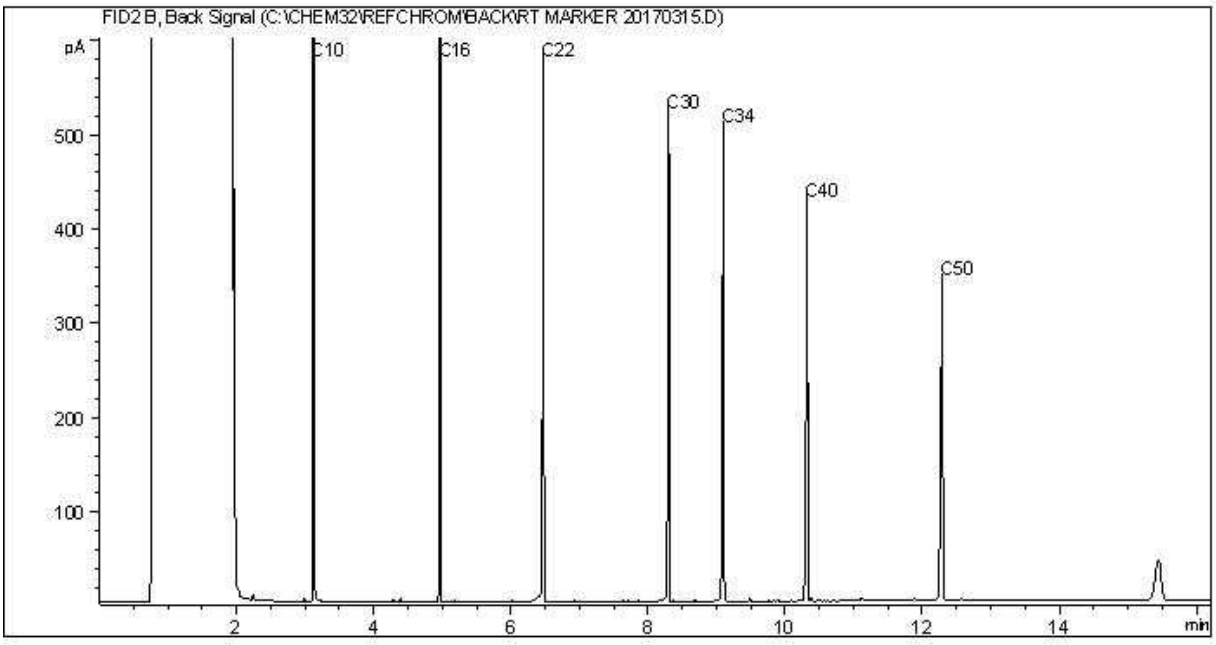
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



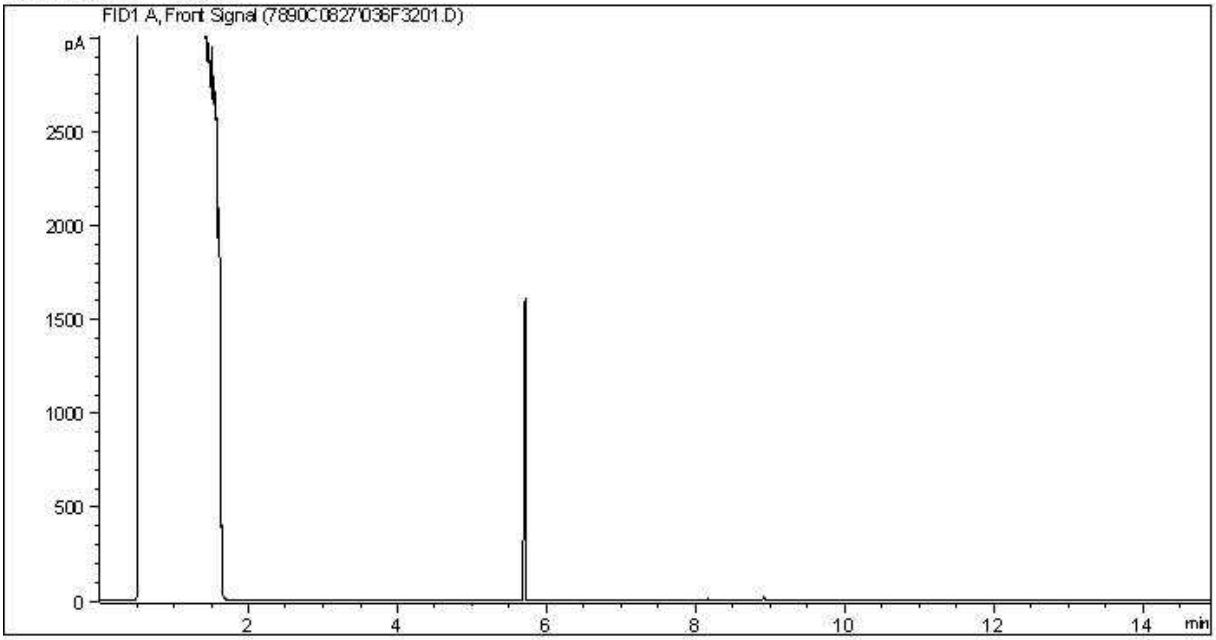
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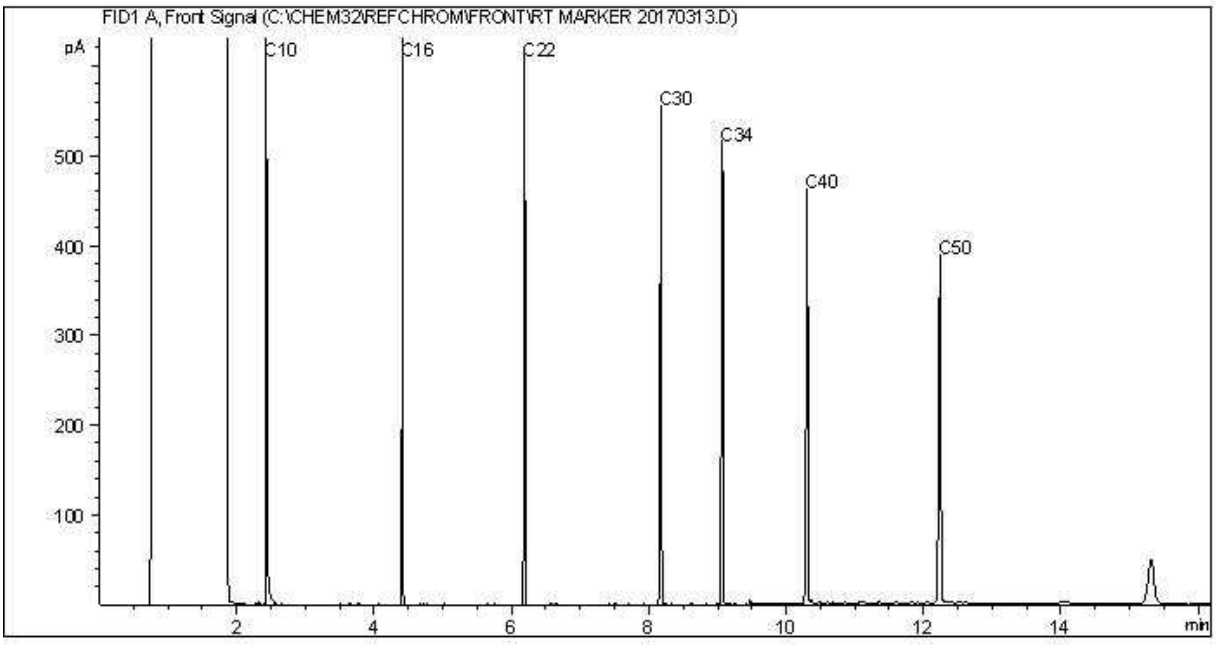
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



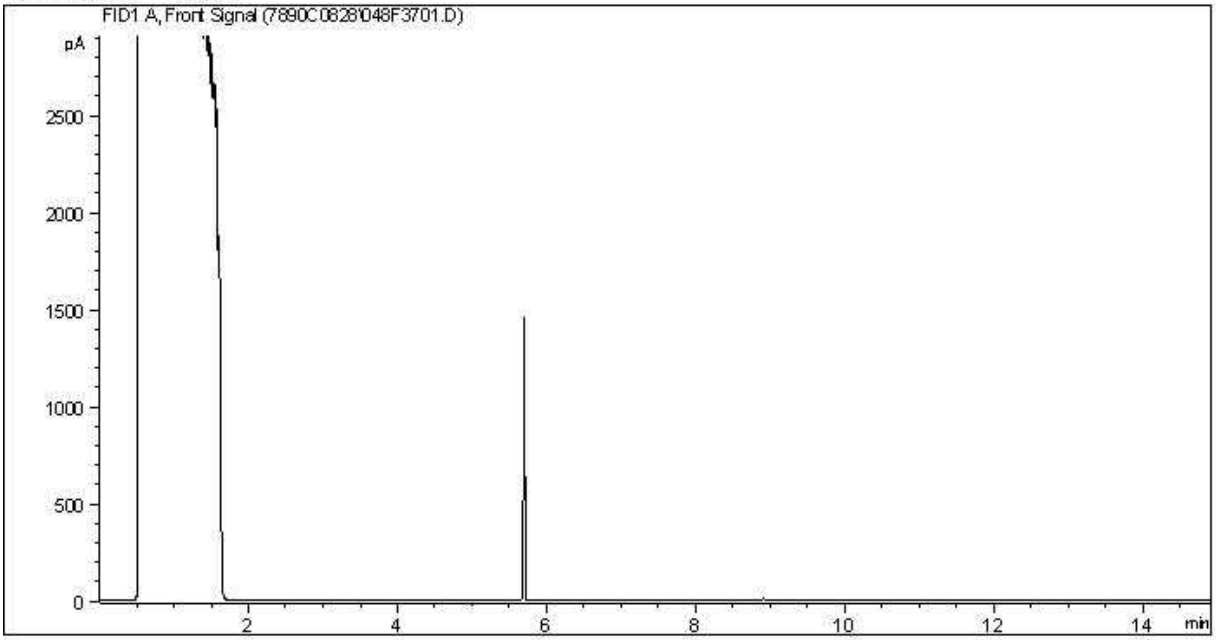
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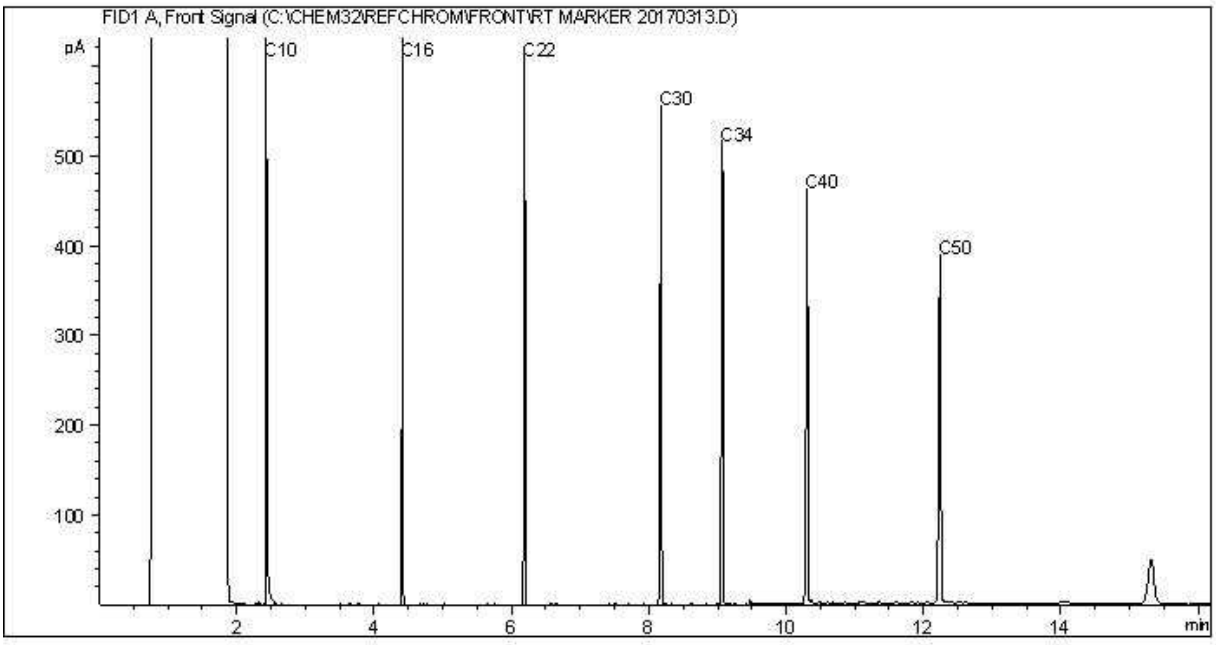
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



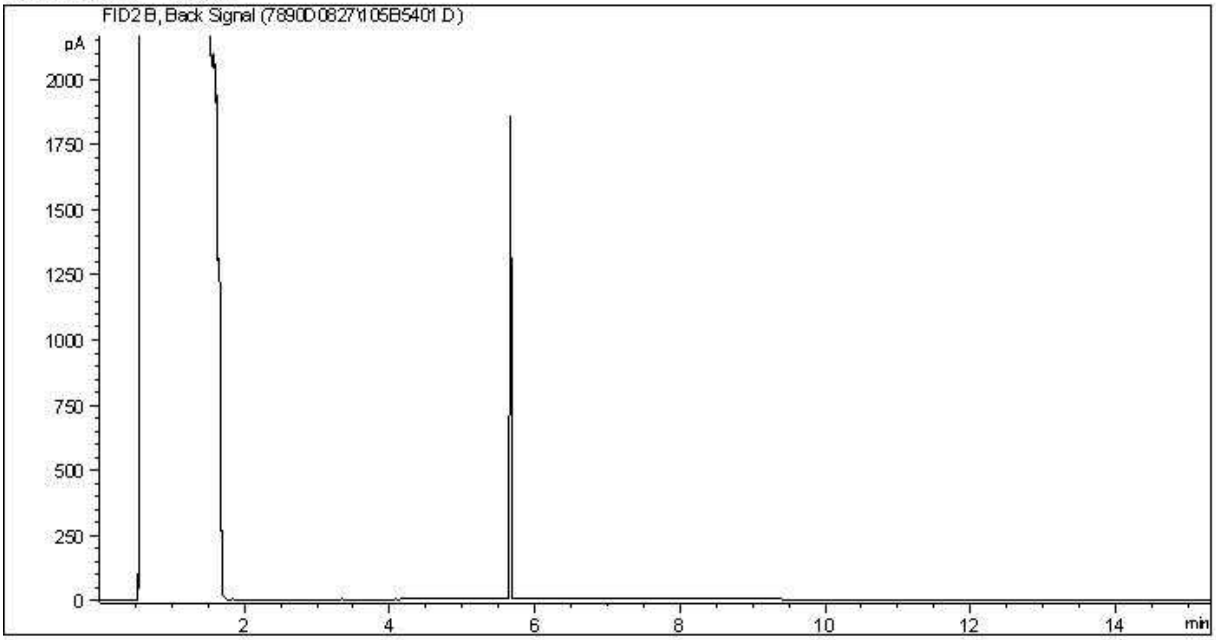
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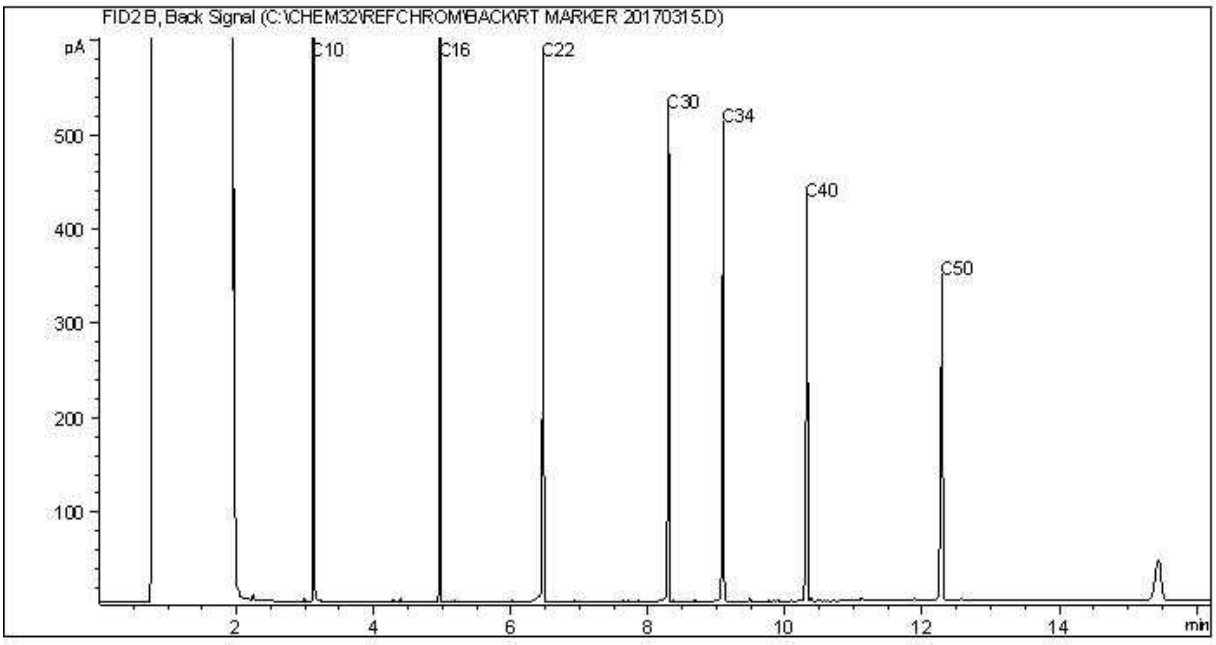
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



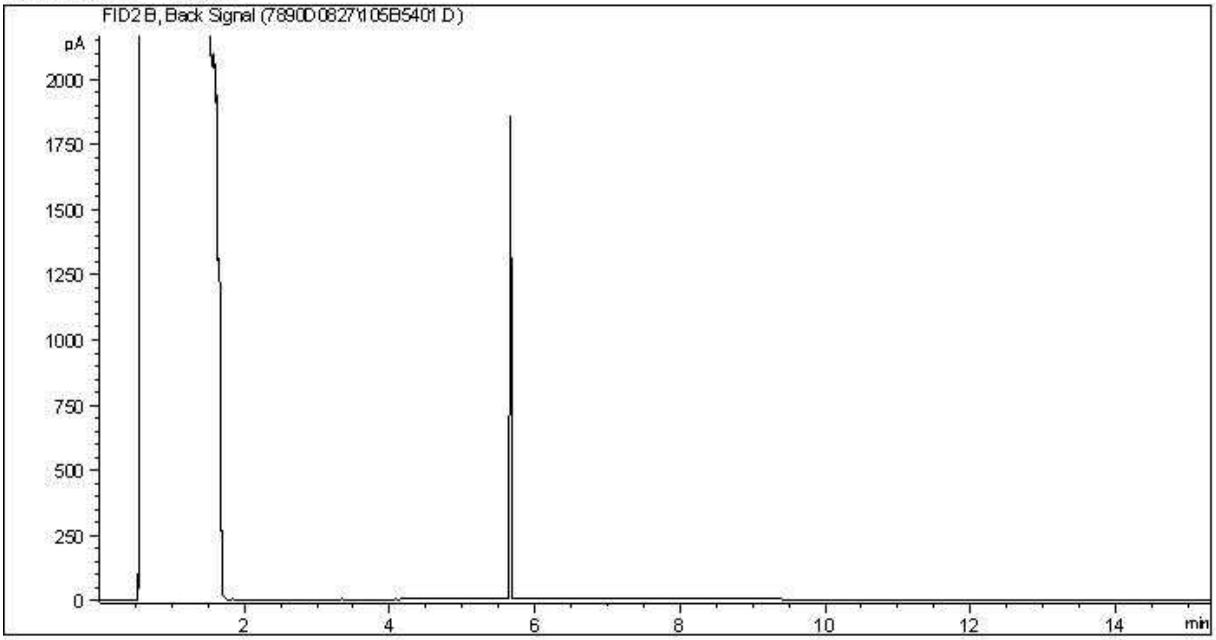
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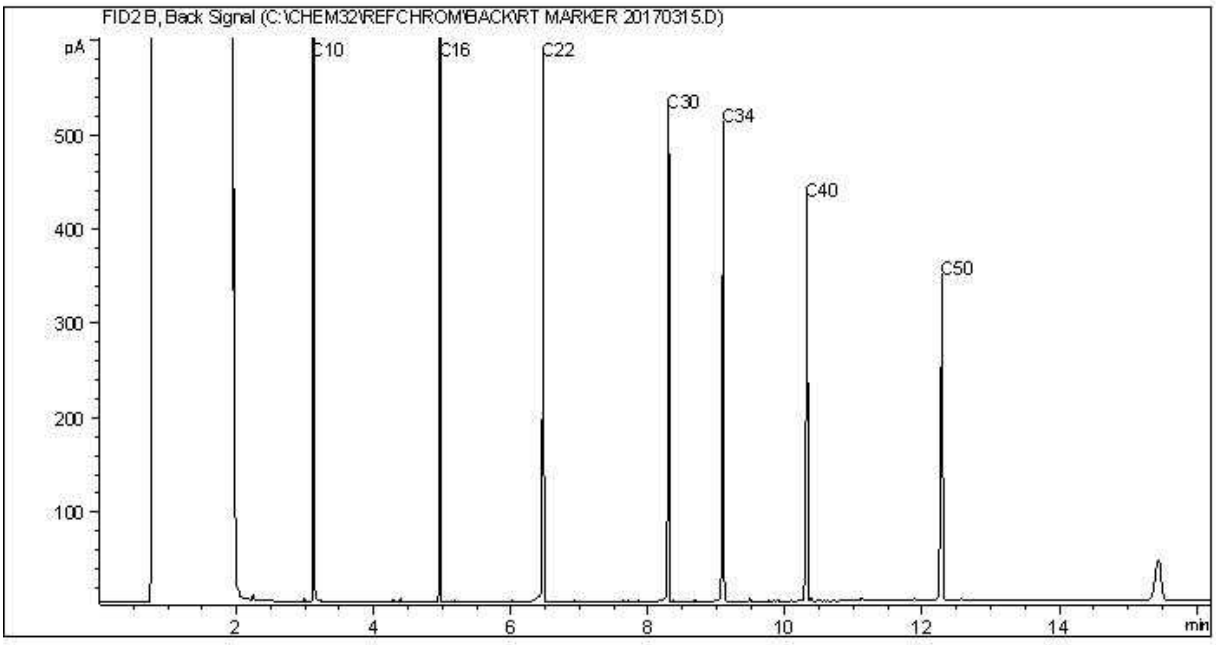
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CCME Hydrocarbons (F2-F4)+F3A/B in soil Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



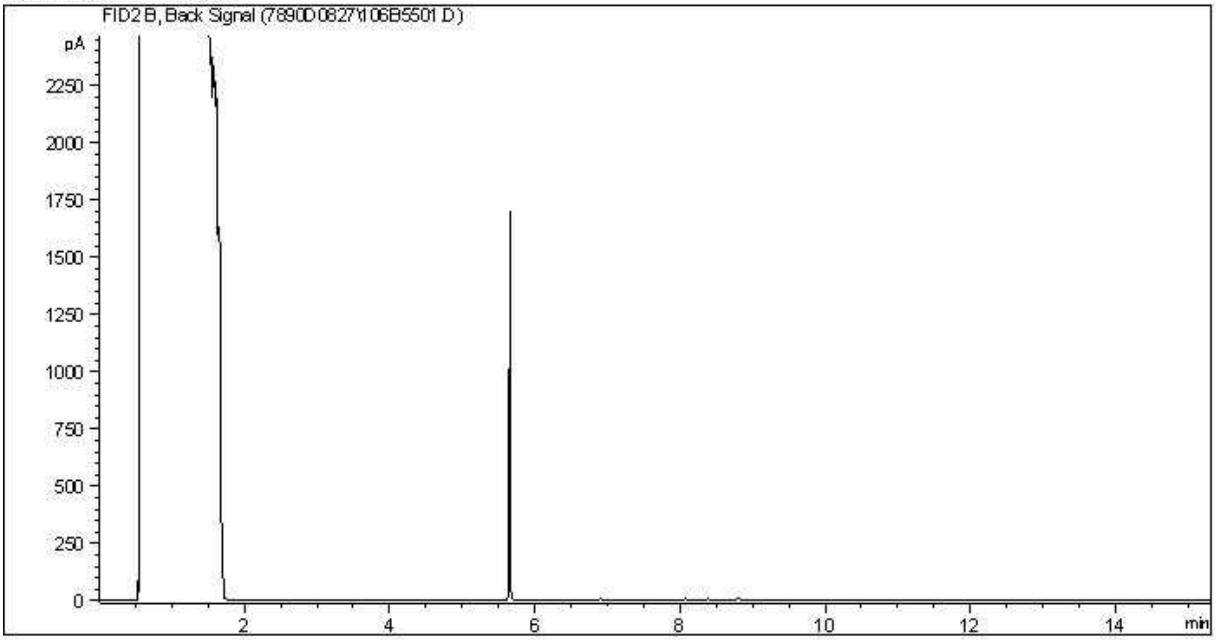
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

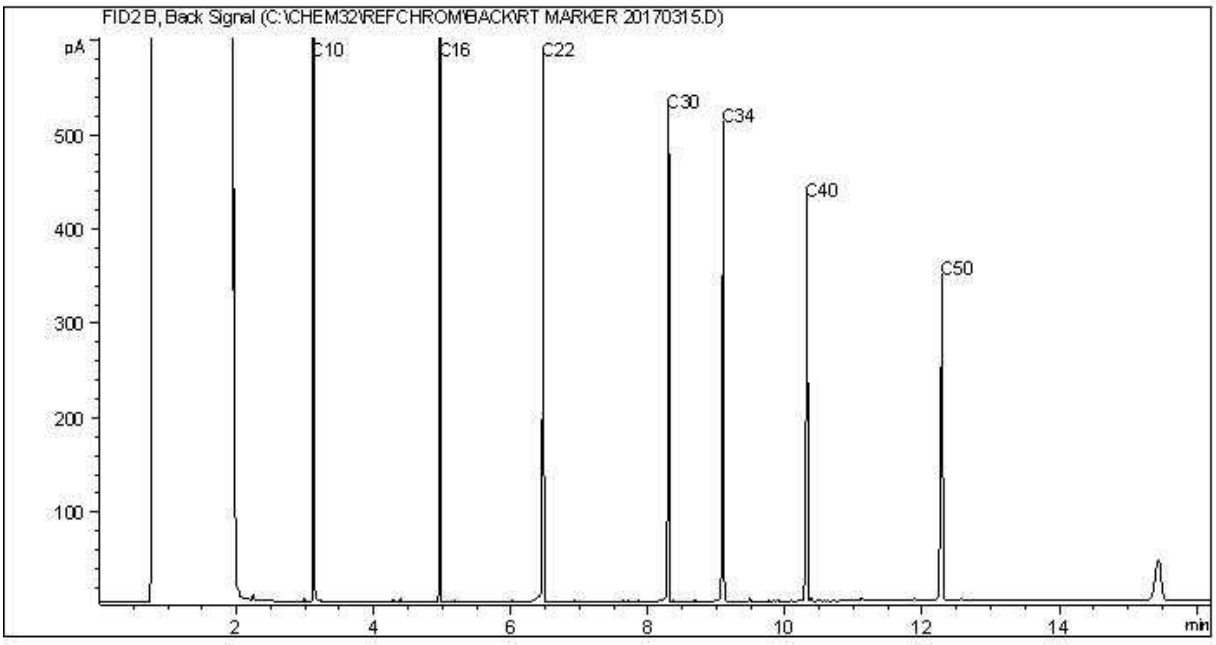
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



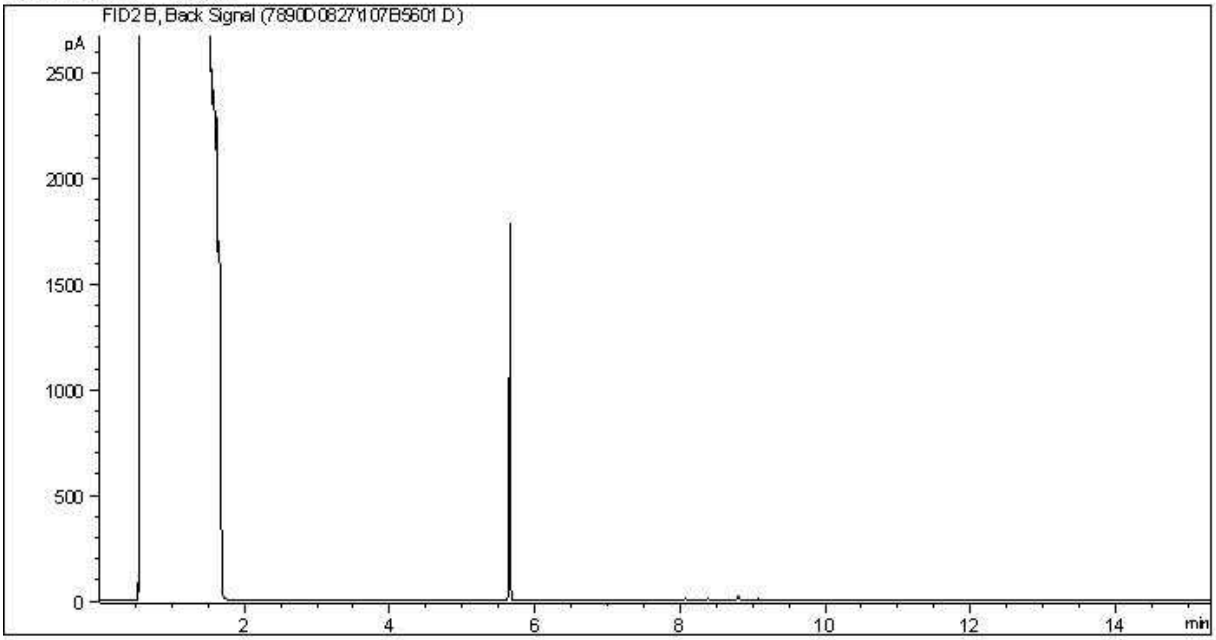
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

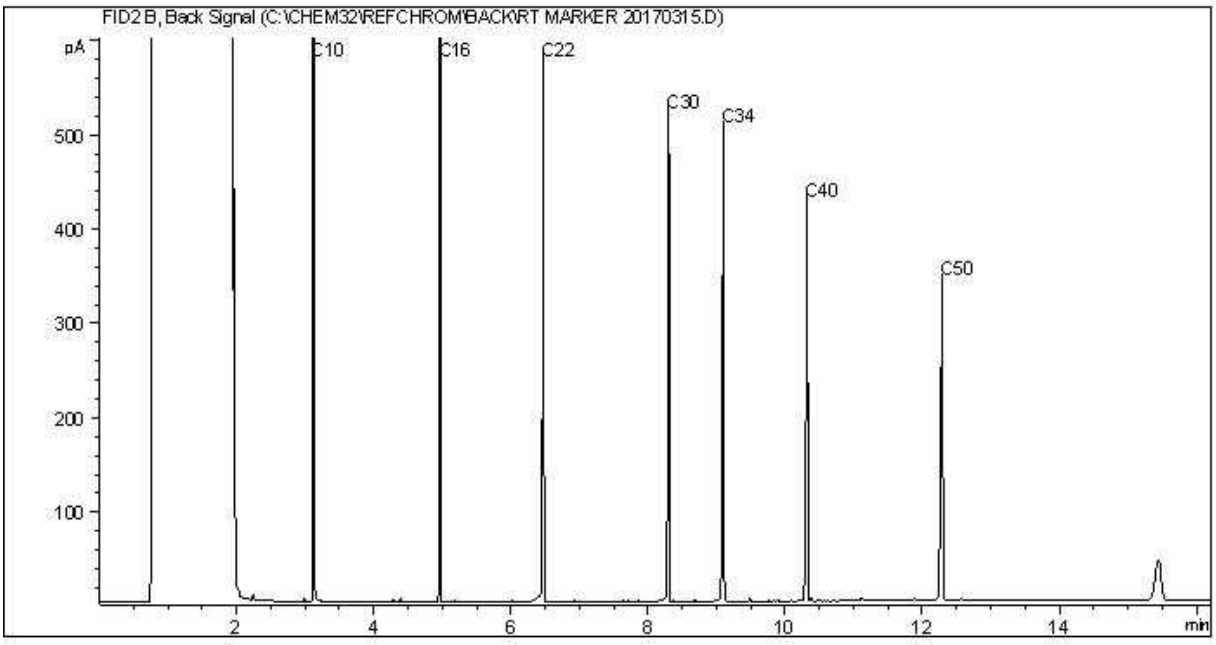
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



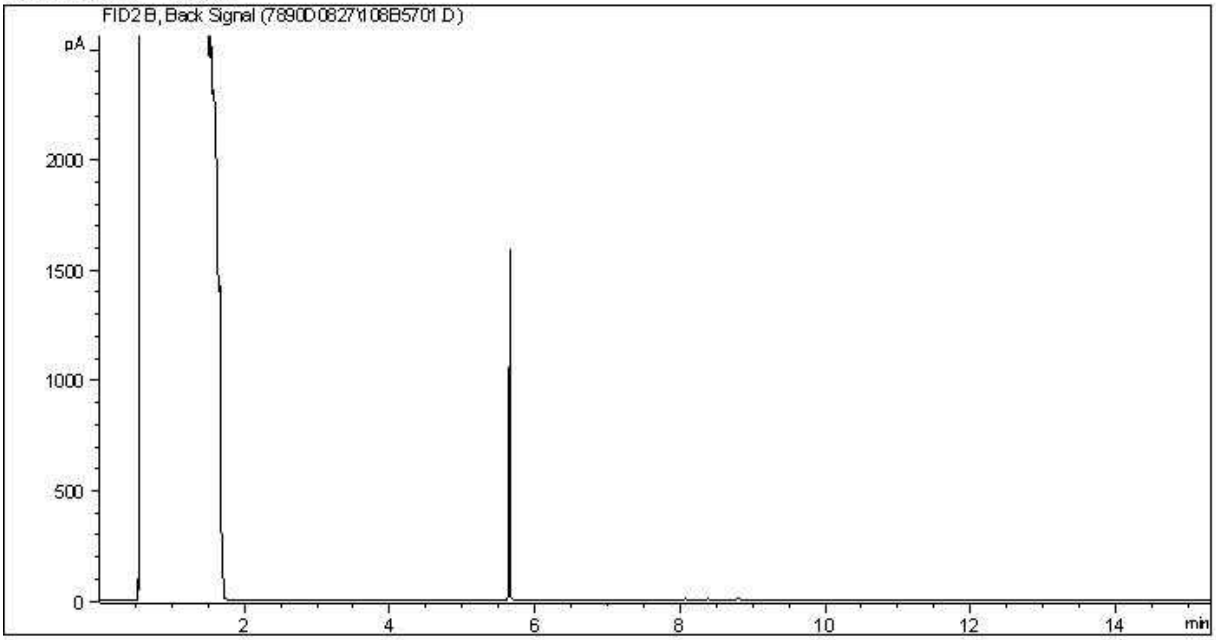
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

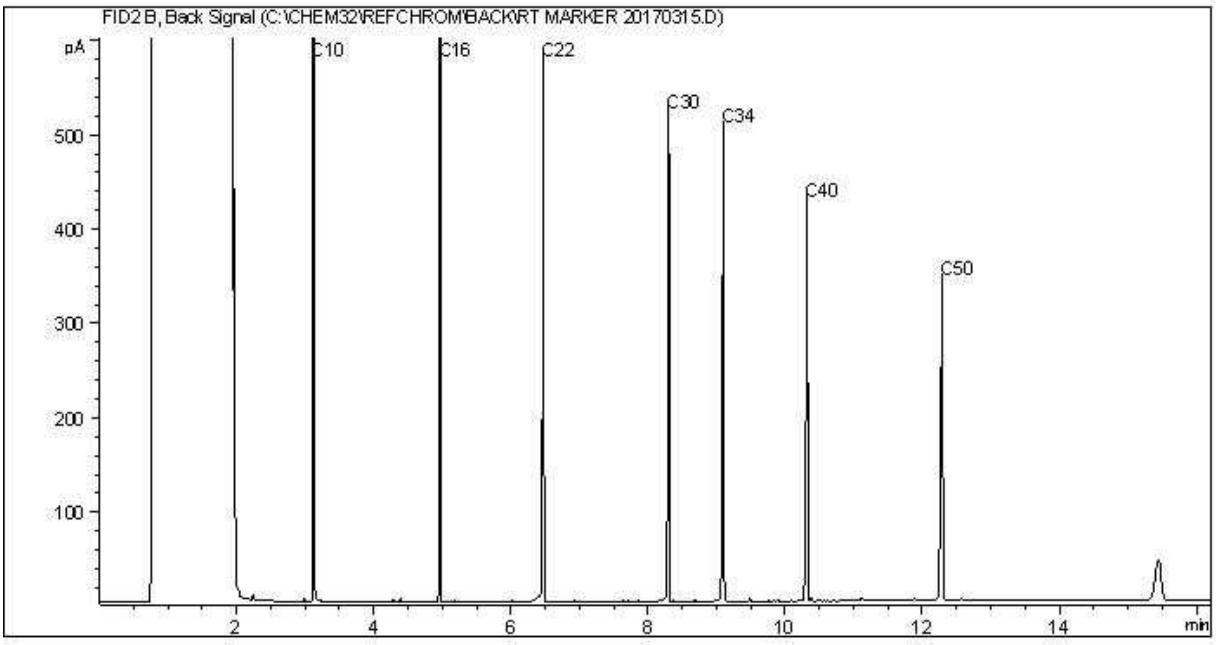
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



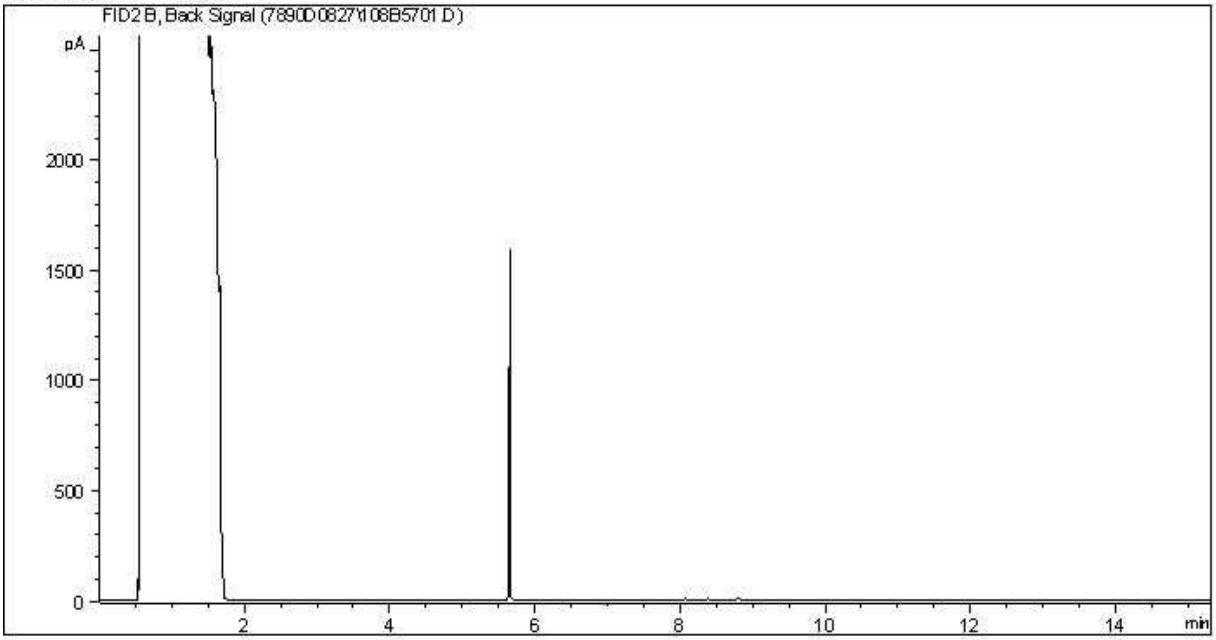
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

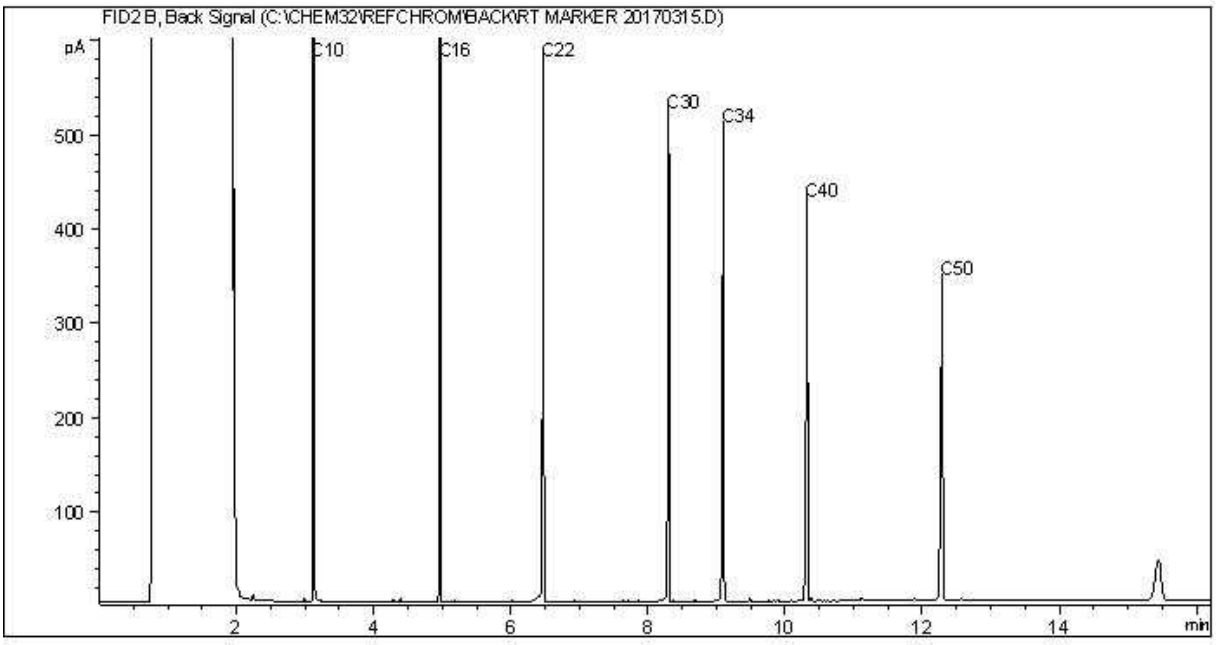
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4)+F3A/B in soil Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

APPENDIX B2

Laboratory QA/QC Reports and Certificates of Analysis – Groundwater

Your Project #: 30000251
Site#: PIN-3
Your C.O.C. #: 591564-03-01, 591564-05-01

Attention: Elliott Holden

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Report Date: 2019/08/30
Report #: R2775181
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B970573
Received: 2019/08/22, 10:05

Sample Matrix: Water
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	13	N/A	2019/08/27	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	3	N/A	2019/08/28	AB SOP-00039	CCME CWS/EPA 8260d m
CCME Hydrocarbons (F2-F4 in water) (1)	6	2019/08/26	2019/08/26	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in water) (1)	10	2019/08/26	2019/08/27	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Elements by ICPMS - Total	16	2019/08/27	2019/08/27	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Silica gel clean up employed.

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: 30000251
Site#: PIN-3
Your C.O.C. #: 591564-03-01, 591564-05-01

Attention: Elliott Holden

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Report Date: 2019/08/30
Report #: R2775181
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B970573
Received: 2019/08/22, 10:05

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parminder Virk, Key Account Specialist
Email: Parminder.Virk@bvlabs.com
Phone# (403)735-2235

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: B970573
Report Date: 2019/08/30

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN WATER (WATER)

BV Labs ID		WJ0044	WJ0044	WJ0045	WJ0046	WJ0047	WJ0048		
Sampling Date		2019/08/16 16:30	2019/08/16 16:30	2019/08/16 14:30	2019/08/16 15:30	2019/08/16 17:30	2019/08/17 15:20		
COC Number		591564-03-01	591564-03-01	591564-03-01	591564-03-01	591564-03-01	591564-03-01		
	UNITS	MW-10	MW-10 Lab-Dup	MW-11	MW-12	MW-17	MW-5	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9562543
F3 (C16-C34 Hydrocarbons)	mg/L	<0.043	<0.043	<0.043	<0.043	<0.043	<0.043	0.043	9562543
F4 (C34-C50 Hydrocarbons)	mg/L	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	0.055	9562543
Volatiles									
F1 (C6-C10)	ug/L	41	<15	32	38	32	<15	15	9562737
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	109	109	109	114	111	115	N/A	9562737
4-Bromofluorobenzene (sur.)	%	97	97	97	96	95	94	N/A	9562737
D4-1,2-Dichloroethane (sur.)	%	98	99	97	87	87	87	N/A	9562737
O-TERPHENYL (sur.)	%	100	98	98	98	97	101	N/A	9562543

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

BV Labs ID		WJ0049	WJ0050	WJ0051	WJ0052	WJ0053	WJ0054		
Sampling Date		2019/08/17 16:00	2019/08/17 17:00	2019/08/18 11:20	2019/08/18 12:30	2019/08/18 13:30	2019/08/18 10:20		
COC Number		591564-03-01	591564-03-01	591564-03-01	591564-03-01	591564-03-01	591564-05-01		
	UNITS	MW-6	MW-8	MW-13	MW-14	MW-15	MW-16	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9562543
F3 (C16-C34 Hydrocarbons)	mg/L	<0.043	<0.043	0.046	<0.043	<0.043	<0.043	0.043	9562543
F4 (C34-C50 Hydrocarbons)	mg/L	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	0.055	9562543
Volatiles									
F1 (C6-C10)	ug/L	63	42	53	71	<15	71	15	9562737
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	108	108	110	110	109	110	N/A	9562737
4-Bromofluorobenzene (sur.)	%	96	96	96	94	98	95	N/A	9562737
D4-1,2-Dichloroethane (sur.)	%	85	85	87	90	96	92	N/A	9562737
O-TERPHENYL (sur.)	%	97	99	99	97	101	100	N/A	9562543

RDL = Reportable Detection Limit
N/A = Not Applicable

BV Labs Job #: B970573
Report Date: 2019/08/30

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

AT1 BTEX AND F1-F4 IN WATER (WATER)

BV Labs ID		WJ0055	WJ0056	WJ0057	WJ0058	WJ0059		
Sampling Date		2019/08/18 18:30	2019/08/18 19:00	2019/08/12	2019/08/18 14:00	2019/08/18 14:20		
COC Number		591564-05-01	591564-05-01	591564-05-01	591564-05-01	591564-05-01		
	UNITS	MW-7	FIELD BLANK	TRIP BLANK	EQUIPMENT BLANK1	EQUIPMENT BLANK2	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9562543
F3 (C16-C34 Hydrocarbons)	mg/L	<0.043	<0.043	<0.043	<0.043	<0.043	0.043	9562543
F4 (C34-C50 Hydrocarbons)	mg/L	<0.055	<0.055	<0.055	<0.055	<0.055	0.055	9562543
Volatiles								
F1 (C6-C10)	ug/L	43	58	<15	<15	31	15	9562737
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	109	108	103	108	107	N/A	9562737
4-Bromofluorobenzene (sur.)	%	95	96	93	96	100	N/A	9562737
D4-1,2-Dichloroethane (sur.)	%	89	88	84	87	86	N/A	9562737
O-TERPHENYL (sur.)	%	102	100	100	102	100	N/A	9562543

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

BV Labs Job #: B970573
Report Date: 2019/08/30

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		WJ0044	WJ0045	WJ0046	WJ0047	WJ0048		
Sampling Date		2019/08/16 16:30	2019/08/16 14:30	2019/08/16 15:30	2019/08/16 17:30	2019/08/17 15:20		
COC Number		591564-03-01	591564-03-01	591564-03-01	591564-03-01	591564-03-01		
	UNITS	MW-10	MW-11	MW-12	MW-17	MW-5	RDL	QC Batch
Elements								
Total Arsenic (As)	mg/L	0.00021	0.00037	0.00031	0.00035	0.00048	0.00020	9563679
Total Cadmium (Cd)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000026	0.000020	9563679
Total Chromium (Cr)	mg/L	<0.0010	0.0085	0.0047	0.0045	<0.0010	0.0010	9563679
Total Cobalt (Co)	mg/L	<0.00030	<0.00030	<0.00030	0.00031	0.00056	0.00030	9563679
Total Copper (Cu)	mg/L	0.0032	0.0078	0.0037	0.0035	0.0041	0.00020	9563679
Total Lead (Pb)	mg/L	0.0010 (1)	0.0085 (1)	0.0040 (1)	0.0040 (1)	0.00014 (1)	0.00010	9563679
Total Nickel (Ni)	mg/L	0.0013	0.0023	0.0046	0.0045	0.011	0.00050	9563679
Total Zinc (Zn)	mg/L	0.012	0.014	0.013	0.013	0.0030	0.0030	9563679

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0049	WJ0050	WJ0051	WJ0052	WJ0053		
Sampling Date		2019/08/17 16:00	2019/08/17 17:00	2019/08/18 11:20	2019/08/18 12:30	2019/08/18 13:30		
COC Number		591564-03-01	591564-03-01	591564-03-01	591564-03-01	591564-03-01		
	UNITS	MW-6	MW-8	MW-13	MW-14	MW-15	RDL	QC Batch
Elements								
Total Arsenic (As)	mg/L	0.00045	0.00040	0.00050	0.00087	0.00054	0.00020	9563679
Total Cadmium (Cd)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9563679
Total Chromium (Cr)	mg/L	0.0045	0.0028	0.0043	0.0065	<0.0010	0.0010	9563679
Total Cobalt (Co)	mg/L	0.00033	0.00063	<0.00030	0.00033	0.00075	0.00030	9563679
Total Copper (Cu)	mg/L	0.0016	0.0011	0.0022	0.0012	0.0051	0.00020	9563679
Total Lead (Pb)	mg/L	0.00024 (1)	0.00022 (1)	0.00040 (1)	0.00035 (1)	0.00044 (1)	0.00010	9563679
Total Nickel (Ni)	mg/L	0.0069	0.011	0.0040	0.0052	0.0049	0.00050	9563679
Total Zinc (Zn)	mg/L	0.014	0.0086	0.032	<0.0030	0.010	0.0030	9563679

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs Job #: B970573
Report Date: 2019/08/30

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		WJ0054	WJ0055	WJ0056	WJ0057	WJ0058		
Sampling Date		2019/08/18 10:20	2019/08/18 18:30	2019/08/18 19:00	2019/08/12	2019/08/18 14:00		
COC Number		591564-05-01	591564-05-01	591564-05-01	591564-05-01	591564-05-01		
	UNITS	MW-16	MW-7	FIELD BLANK	TRIP BLANK	EQUIPMENT BLANK1	RDL	QC Batch
Elements								
Total Arsenic (As)	mg/L	0.00057	0.00059	<0.00020	<0.00020	<0.00020	0.00020	9563679
Total Cadmium (Cd)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9563679
Total Chromium (Cr)	mg/L	0.013	0.0046	<0.0010	<0.0010	0.0072	0.0010	9563679
Total Cobalt (Co)	mg/L	<0.00030	0.00073	<0.00030	<0.00030	<0.00030	0.00030	9563679
Total Copper (Cu)	mg/L	0.0038	0.0013	<0.00020	<0.00020	0.00047	0.00020	9563679
Total Lead (Pb)	mg/L	0.00062 (1)	0.00034 (1)	<0.00010 (1)	<0.00010 (1)	<0.00010 (1)	0.00010	9563679
Total Nickel (Ni)	mg/L	0.0075	0.012	<0.00050	<0.00050	0.00059	0.00050	9563679
Total Zinc (Zn)	mg/L	<0.0030	0.011	<0.0030	<0.0030	<0.0030	0.0030	9563679

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

BV Labs ID		WJ0059		
Sampling Date		2019/08/18 14:20		
COC Number		591564-05-01		
	UNITS	EQUIPMENT BLANK2	RDL	QC Batch
Elements				
Total Arsenic (As)	mg/L	<0.00020	0.00020	9563679
Total Cadmium (Cd)	mg/L	<0.000020	0.000020	9563679
Total Chromium (Cr)	mg/L	<0.0010	0.0010	9563679
Total Cobalt (Co)	mg/L	<0.00030	0.00030	9563679
Total Copper (Cu)	mg/L	<0.00020	0.00020	9563679
Total Lead (Pb)	mg/L	<0.00010 (1)	0.00010	9563679
Total Nickel (Ni)	mg/L	<0.00050	0.00050	9563679
Total Zinc (Zn)	mg/L	<0.0030	0.0030	9563679

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.4°C
Package 2	4.4°C
Package 3	5.2°C
Package 4	2.9°C
Package 5	6.2°C
Package 6	1.1°C
Package 7	5.8°C

BTEXF1-4: Detection limits calculated based on method detection limits (MDLs) at client request.
Revised report issued to reflect correct sample IDs as per client email on 2019/08/29.
Revised report issued with modified RDLs on 2019/08/30.

Sample WJ0057 [TRIP BLANK] : Sample was analyzed past method specified hold time for BTEX/F1 in Water by HS GC/MS/FID.

Results relate only to the items tested.

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

BV Labs Job #: B970573
Report Date: 2019/08/30

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 30000251
Sampler Initials: EH

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9562543	O-TERPHENYL (sur.)	2019/08/26	101	60 - 140	105	60 - 140	101	%		
9562737	1,4-Difluorobenzene (sur.)	2019/08/28	107	50 - 140	103	50 - 140	110	%		
9562737	4-Bromofluorobenzene (sur.)	2019/08/28	94	50 - 140	89	50 - 140	99	%		
9562737	D4-1,2-Dichloroethane (sur.)	2019/08/28	83	50 - 140	78	50 - 140	99	%		
9562543	F2 (C10-C16 Hydrocarbons)	2019/08/26	108	60 - 140	112	60 - 140	<0.020	mg/L	NC	30
9562543	F3 (C16-C34 Hydrocarbons)	2019/08/26	109	60 - 140	114	60 - 140	<0.043	mg/L	NC	30
9562543	F4 (C34-C50 Hydrocarbons)	2019/08/26	102	60 - 140	108	60 - 140	<0.055	mg/L	NC	30
9562737	F1 (C6-C10)	2019/08/28	103	60 - 140	117	60 - 140	<15	ug/L	NC	30
9563679	Total Arsenic (As)	2019/08/27	98	80 - 120	97	80 - 120	<0.00020	mg/L		
9563679	Total Cadmium (Cd)	2019/08/27	96	80 - 120	97	80 - 120	<0.000020	mg/L		
9563679	Total Chromium (Cr)	2019/08/27	101	80 - 120	102	80 - 120	<0.0010	mg/L		
9563679	Total Cobalt (Co)	2019/08/27	97	80 - 120	99	80 - 120	<0.00030	mg/L		
9563679	Total Copper (Cu)	2019/08/27	96	80 - 120	100	80 - 120	<0.00020	mg/L		
9563679	Total Lead (Pb)	2019/08/27	98	80 - 120	100	80 - 120	<0.00020	mg/L	2.4	20
9563679	Total Nickel (Ni)	2019/08/27	95	80 - 120	98	80 - 120	<0.00050	mg/L		
9563679	Total Zinc (Zn)	2019/08/27	95	80 - 120	97	80 - 120	<0.0030	mg/L		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Laboratories Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Justin Geisel, B.Sc., Organics Supervisor

Roland Menard, Analyst II

Suwan Fock, B.Sc., QP, Inorganics Senior Analyst

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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BUREAU VERITAS

Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

1177(7)

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS "INVOICE TO"	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970573	591564
Address	1050 Morrison Drive Suite 201	Address		Project #	30000251	Chain Of Custody Record	Project Manager
	Ottawa ON K2H 8K7			Project Name		C#591564-03-01	Parminder Virk
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Site #	PIN-3		
Email	Jacob.Holden@arcadis.com	Email	TROY.AUSTRINS@ARCADIS.COM	Sampled By	Elliott Holden		

Regulatory Criteria
NOTIFY THE LAB FOR REQUIRED DLS AS PER THE ATTACHED DOCUMENT.
CONTACT P. VIRK IF THERE ARE ANY QUESTIONS REGARDING MDLS.

Special Instructions
METALS: ONLY REPORT As, Cd, Cr, Co, Cu, Pb, Ni, Zinc.
PHCS: ONLY REPORT F1, F2, F3, & F4 (i.e. NO BTEX)

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT (will be applied if Rush TAT is not specified) — X
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4 (NO BTEX)	TOTAL As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	# of Bottles	Comments
1		MW-10	19/08/16	16:30	GW		N	X	X	5	GROUND WATER: METALS NOT PRESERVED AND NOT FIELD FILTERED.
2		MW-11	19/08/16	14:30	GW		N	X	X	5	
3		MW-12	19/08/16	15:30	GW		N	X	X	5	ANALYSE FOR TOTAL METALS ONLY.
4		MW-17	19/08/16	17:30	GW		N	X	X	5	THIS COMMENT APPLIES TO ALL SAMPLES LISTED.
5		MW-5	19/08/17	15:20	GW		N	X	X	5	
6		MW-6	19/08/17	16:00	GW		N	X	X	5	Received in Yellowknife By:
7		MW-8	19/08/17	17:00	GW		N	X	X	5	
8		MW-13	19/08/18	11:20	GW		N	X	X	5	AUG 22 2019 @ 10:05
9		MW-14	19/08/18	12:30	GW		N	X	X	5	
10		MW-15	19/08/18	13:30	GW		N	X	X	5	Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	Tosh Ali	2019/08/23	1120		☐	See ACTR	☐ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS "INVOICE TO"	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970573	591564
Address	1050 Morrison Drive Suite 201	Address		Project #	30000251	Chain Of Custody Record	Project Manager
	Ottawa ON K2H 8K7			Project Name		C#591564-05-01	Parminder Virk
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Site #	PIN-3		
Email	Jacob.Holden@arcadis.com	Email	TROY.AUSTRINS@ARCADIS.COM	Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria: SAME AS PAGE 1

Special Instructions: SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4 (NO BTEX)	TOTAL As, Cd, Cr, Co, Pb, Ni, Zinc								# of Bottles	Comments
1		MW-16	19/08/18	10:20	GW		N	X	X								5	SAME AS PAGE 1
2		MW-7	19/08/18	18:30	GW		N	X	X								5	
3		FIELD BLANK	19/08/18	19:00	W		N	X	X								5	
4		TRIP BLANK	19/08/12		W		N	X	X								5	
5		EQUIPMENT BLANK 1	19/08/18	14:00	W		N	X	X								5	
6		EQUIPMENT BLANK 2	19/08/18	14:20	W		N	X	X								5	
7																		
8																		
9																		
10																		

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT X

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

Received in Yellowknife
By: [signature]
AUG 22 2019 @ 16:05

Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[signature]	2019/08/22	1120			SOA	Yes / No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

APPENDIX C

Thermistor Inspection Reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-19
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	Main Landfill
*Thermistor #:	**VT-1**	Inclination:	☑ Vertical □ Inclined
*Northing:	7597714.8	*Easting:	407967.9
*Installation Date:	2004-09-05	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 Revision H-C	Datalogger Cable Model:	□ USB ☑ Serial Port
Datalogger Serial #:	108043	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	10.714	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	Time on logger did not match local time
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□		
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				2014-08-14
	Battery levels:				Main: 11.34v Auxiliary: 13.14v
	Memory battery best before date:				expiry July 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models: ULB-15 and ULB 1
	New battery levels:			□	Main: 11.34v Auxiliary: 13.14v
	Was desiccant replaced?	☑	□		
Final Status	Expected life of batteries in datalogger:				Years: 6 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs? □ Y ☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	kohms	°C
1	11.554	4.90
2	13.024	4.51
3	14.545	2.31
4	15.888	0.57
5	16.880	-0.61
6	17.646	-1.47
7	19.098	-2.99
8	20.19	-4.1

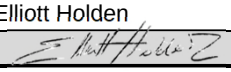
Bead	kohms	°C
9	21.05	-4.8
10	22.22	-5.9
11	22.70	-6.3
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-19
Inspector Signature: 	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	Main Landfill
*Thermistor #:	**VT-2**	Inclination:	☑ Vertical □ Inclined
*Northing:	7597735.4	*Easting:	407878.8
*Installation Date:	2004-09-05	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 Revision H-C	Datalogger Cable Model:	□ USB ☑ Serial Port
Datalogger Serial #:	111103	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	7.92	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	Time on logger did not match local time
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				2014-08-17		
	Battery levels:				Main: 11.34v	Auxiliary: 13.63v	
	Memory battery best before date:				expiry July 2005		(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models: ULB-15 and ULB 1		
	New battery levels:			□	Main: 11.34v	Auxiliary: 13.63v	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 6	Replace by: 06	2026
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	kohms	°C
1	10.054	4.90
2	10.203	9.48
3	10.085	9.72
4	10.907	8.11
5	11.257	7.46
6	12.508	5.32
7	13.907	3.20
8	15.553	0.99

Bead	kohms	°C
9	16.639	-0.33
10	17.331	-1.12
11	17.965	-1.82
12	18.685	-2.58
13	19.227	-3.12
14	19.830	-3.71
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-19
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	Main Landfill
*Thermistor #:	**VT-3**	Inclination:	☑ Vertical □ Inclined
*Northing:	7597635.8	*Easting:	407963.8
*Installation Date:	2004-09-05	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 Revision H-C	Datalogger Cable Model:	□ USB ☑ Serial Port
Datalogger Serial #:	111108	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	10.014	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	□	☑	An error was encountered when logger was connected
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	□	☑				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				2014-08-17		
	Battery levels:				Main: 11.34v	Auxiliary: 13.38v	
	Memory battery best before date:				expiry July 2005	(Refer to yellow label above COM plug)	
Battery Replacement	Were batteries replaced?	□	□		If yes, models:		
	New battery levels:			☑	Main:	Auxiliary:	
	Was desiccant replaced?	□	□		**See note at bottom of form for more detials**		
Final Status	Expected life of batteries in datalogger:				Years: 6	Replace by: 06	2026
	Was datalogger functional upon departure?	□	☑		If no, brought south for repairs?	☑ Y	□ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	kohms	°C
1	11.509	4.90
2	12.979	4.58
3	14.483	2.39
4	15.790	0.69
5	16.849	-0.58
6	17.713	-1.55
7	19.183	-3.08
8	20.16	-4.03

Bead	kohms	°C
9	21.33	-5.10
10	22.26	-5.9
11	22.80	-6.4
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

Note: Replacement Datalogger (Serial # 02020270) was installed at VT-3. This datalogger was fitted with new batteries and desiccants. Battery levels were 11.34v for main (ULB-15) and 13.14v for auxiliary (ULB-1). Replace batteries by June 2026. Date when memory full: 2024-05-19

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-19
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	Main Landfill
*Thermistor #:	**VT-4**	Inclination:	☑ Vertical □ Inclined
*Northing:	7597625.0	*Easting:	407899.6
*Installation Date:	2004-09-05	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 Revision H-C	Datalogger Cable Model:	□ USB ☑ Serial Port
Datalogger Serial #:	108093	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	7.82	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	Time on logger did not match local time
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				2014-08-17		
	Battery levels:				Main: 11.34v	Auxiliary: 13.75v	
	Memory battery best before date:				expiry July 2005		(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models: ULB-15 and ULB 1		
	New battery levels:			□	Main: 11.34v	Auxiliary: 13.75v	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 6	Replace by: 06	2026
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	kohms	°C
1	10.047	4.90
2	10.541	8.81
3	11.230	7.51
4	13.095	4.40
5	14.327	2.61
6	15.797	0.68
7	16.682	-0.38
8	17.427	-1.23

Bead	kohms	°C
9	18.035	-1.89
10	18.907	-2.80
11	19.609	-3.50
12	19.830	-3.71
13	-	-
14	-	-
15	-	-
16	-	-

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-16
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	Tier II Disposal Facility
*Thermistor #:	**VT-5**	Inclination:	☑ Vertical □ Inclined
*Northing:	7597408.9	*Easting:	409506.7
*Installation Date:	2004-09-09	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 Revision H-C	Datalogger Cable Model:	□ USB ☑ Serial Port
Datalogger Serial #:	108066	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	19.2	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	□	☑	An error was encountered when logger was connected
Cable Functionality	☑	□	
Bead Functionality	□	☑	Beads 10 and 16 appear to be malfunctioning

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	□	☑		Status light was dark. Battery Expiry Date: July 2019
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				2014-08-17
	Battery levels:				Main: Auxiliary:
	Memory battery best before date:				expiry July 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	□	□		If yes, models:
	New battery levels:			☑	Main: Auxiliary:
	Was desiccant replaced?	□	□		**See note at bottom of form for more detials**
Final Status	Expected life of batteries in datalogger:				Years: 6 Replace by: 06 2026
	Was datalogger functional upon departure?	□	☑		If no, brought south for repairs? ☑ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	□	☑

Manual Ground Temperature Readings

Bead	kohms	°C
1	10.390	4.90
2	10.414	9.06
3	9.991	9.91
4	12.017	6.13
5	12.854	4.77
6	14.305	2.64
7	16.169	0.23
8	18.512	-2.40

Bead	kohms	°C
9	19.199	-3.10
10	19.84	-3.7
11	20.71	-4.5
12	21.23	-5.0
13	21.98	-5.7
14	22.55	-6.1
15	23.58	-7.0
16	24.56	-7.7

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

Note: Replacement Datalogger (Serial # 07110006) was installed at VT-5. This datalogger was fitted with new batteries and desiccants. Battery levels were 11.34v for main (ULB-15) and 13.63v for auxiliary (ULB-1). Replace batteries by June 2026. Date when memory full: 2024-05-19

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-16
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name: PIN-3	*Landfill: Tier II Disposal Facility
*Thermistor #: **VT-6**	Inclination: ☑ Vertical □ Inclined
*Northing: 7597408.0	*Easting: 409546.7
*Installation Date: 2004-09-08	*Year 1 Monitoring Date: 2007-08-23
Datalogger Model #: RX-16 Revision H-C	Datalogger Cable Model: □ USB ☑ Serial Port
Datalogger Serial #: 111096	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 18.9	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	Time on logger did not match local time
Cable Functionality	☑	□	
Bead Functionality	□	☑	Beads 10 and 16 appear to be malfunctioning

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□		
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				2014-08-17
	Battery levels:				Main: 11.34v Auxiliary: 13.02v
	Memory battery best before date:				expiry July 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models: ULB-15 and ULB 1
	New battery levels:			□	Main: 11.34v Auxiliary: 13.14v
	Was desiccant replaced?	☑	□		
Final Status	Expected life of batteries in datalogger:				Years: 6 Replace by: 06 2026
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs? □ Y ☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	kohms	°C
1	10.592	4.90
2	12.966	4.60
3	9.904	10.10
4	11.579	6.88
5	12.937	4.64
6	14.397	2.51
7	16.395	-0.05
8	18.079	-1.94

Bead	kohms	°C
9	18.771	-2.66
10	19.535	-3.43
11	20.34	-4.2
12	21.18	-5.0
13	21.80	-5.5
14	22.54	-6.1
15	23.63	-7.0
16	24.40	-7.6

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-16
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	Tier II Disposal Facility
*Thermistor #:	**VT-7**	Inclination:	☑ Vertical □ Inclined
*Northing:	7597351.7	*Easting:	409506.1
*Installation Date:	2003-09-10	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 Revision H-C	Datalogger Cable Model:	□ USB ☑ Serial Port
Datalogger Serial #:	111099	Datalogger Cable Too Short?:	□ Y ☑ N
*Elevation (masl):	18.0	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	□	☑	An error was encountered when logger was connected
Cable Functionality	☑	□	
Bead Functionality	□	☑	Bead 16 appears to be malfunctioning

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	□	☑		Status light was dark. Battery Expiry Date: July 2019
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:				2014-08-17
	Battery levels:				Main: Auxiliary:
	Memory battery best before date:				expiry July 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	□	□		If yes, models:
	New battery levels:			☑	Main: Auxiliary:
	Was desiccant replaced?	□	□		**See note at bottom of form for more detials**
Final Status	Expected life of batteries in datalogger:				Years: 6 Replace by: 06 2026
	Was datalogger functional upon departure?	□	☑		If no, brought south for repairs? ☑ Y □ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	□	☑

Manual Ground Temperature Readings

Bead	kohms	°C
1	9.521	4.90
2	10.711	8.48
3	12.749	4.94
4	14.175	2.82
5	15.940	0.50
6	17.313	-1.10
7	17.993	-1.85
8	18.641	-2.53

Bead	kohms	°C
9	19.475	-3.37
10	20.24	-4.1
11	20.94	-4.7
12	21.65	-5.4
13	21.14	-4.9
14	22.52	-6.1
15	23.29	-6.7
16	23.40	-6.8

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

Note: Replacement Datalogger (Serial # 07110055) was installed at VT-7. This datalogger was fitted with new batteries and desiccants. Battery levels were 11.34v for main (ULB-15) and 13.63v for auxiliary (ULB-1). Replace batteries by June 2026. Date when memory full: 2024-05-19

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Elliott Holden	Inspection Date: 2019-08-16
Inspector Signature:	*Previous Inspection Date: 2014-08-17

Thermistor Information

*Site Name: PIN-3	*Landfill: Tier II Disposal Facility
*Thermistor #: **VT-8**	Inclination: ☑ Vertical □ Inclined
*Northing: 7597350.9	*Easting: 409545.8
*Installation Date: 2003-09-09	*Year 1 Monitoring Date: 2007-08-23
Datalogger Model #: RX-16 Revision H-C	Datalogger Cable Model: □ USB ☑ Serial Port
Datalogger Serial #: 111091	Datalogger Cable Too Short?: □ Y ☑ N
*Elevation (masl): 17.9	Extension Cable Required (m): ☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	Time on logger did not match local time
Cable Functionality	☑	□	
Bead Functionality	□	☑	Bead 16 appears to be malfunctioning

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				2014-08-17		
	Battery levels:				Main: 11.34v	Auxiliary: 13.38v	
	Memory battery best before date:				expiry July 2005		(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☑	□		If yes, models: ULB-15 and ULB 1		
	New battery levels:			□	Main: 11.34v	Auxiliary: 13.38v	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 6	Replace by: 06	2026
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	kohms	°C
1	9.641	4.90
2	11.017	7.90
3	12.623	5.14
4	13.921	3.18
5	15.912	0.54
6	17.423	-1.23
7	18.12	-2.0
8	18.78	-2.7

Bead	kohms	°C
9	19.51	-3.4
10	20.26	-4.1
11	21.01	-4.8
12	21.80	-5.5
13	22.31	-5.9
14	22.59	-6.2
15	22.86	-6.4
16	23.70	-7.1

Datalogger Programming and Maintenance

Data collection frequency: 48 hr
Data collection time: Noon
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

APPENDIX D

Groundwater Monitoring Well Sampling Logs

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Landfill

Date: 2019-08-17 Time: 14:39

Weather: Sunny, High 11°C, Low 1°C

Monitoring Well ID: MW-5 UTM Coordinates: 7597694.1N 408046.3E Zone 12

Sample #: MW-5 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.9 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.57 Screen Length (m): 3.33

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.442

Depth to Water (From Top of Pipe) (m): 1.847

Calculated Static Water Level (mbgs): 1.405

Well Refusal Depth (m): 3.021 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.174 Water Volume (L): 2.348 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
14:42	8.78	567	1.6	9.72
14:52	8.27	583	0.4	8.55
14:57	8.22	585	0.0	7.23
15:02	8.15	586	0.0	6.27
15:07	8.16	586	0.1	6.21
15:12	8.16	586	0.1	6.19
15:17	8.15	587	0.1	6.20
Final Time: 15:17 Final Values:	8.15	587	0.1	6.20

Clear? ☑ Y ☐ N Colour: Slightly Brown

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Landfill

Date: 2019-08-17 Time: 15:23

Weather: Sunny, High 11°C, Low 1°C

Monitoring Well ID: MW-6 UTM Coordinates: 7597730.9N 407854.9E Zone 12

Sample #: MW-6 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.73 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.53 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.565

Depth to Water (From Top of Pipe) (m): 1.653

Calculated Static Water Level (mbgs): 1.088

Well Refusal Depth (m): 2.785 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.132 Water Volume (L): 2.264 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.4 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
15:28	7.91	796	0.0	7.97
15:33	7.85	874	0.0	7.32
15:38	7.85	909	0.0	7.29
15:43	7.86	918	0.0	7.01
15:48	7.84	918	0.0	6.68
15:53	7.84	919	0.0	6.72
Final Time: 15:53 Final Values:	7.84	919	0.0	6.72

Clear? ☑ Y ☐ N Colour: Slightly Brown

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Landfill

Date: 2019-08-17 Time: 16:02

Weather: Sunny, High 11°C, Low 1°C

Monitoring Well ID: MW-7 UTM Coordinates: 7597686.4N 407914.5E Zone 12

Sample #: MW-7 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.8 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.6 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.315

Depth to Water (From Top of Pipe) (m): 2.186

Calculated Static Water Level (mbgs): 1.871

Well Refusal Depth (m): 2.771 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.585 Water Volume (L): 1.17 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☑ Y ☐ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☐ < Recharge Rate ☑ > Recharge Rate

Total Volume Purged (L): 1.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
2019-08-17 16:04	9.91	674	41.2	6.25
2019-08-17 16:09	12.11	436	15.5	6.21
2019-08-17 16:14	11.83	425	9.3	6.22
WELL WENT DRY - SLOW RECHARGE				
2019-08-18 18:23	8.75	410	0.5	4.35
2019-08-18 18:28	8.23	411	0.2	4.31
Final Time: 18:28 Final Values:	8.23	411	0.2	4.31

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Landfill

Date: 2019-08-17 Time: 16:30

Weather: Sunny, High 11°C, Low 1°C

Monitoring Well ID: MW-8 UTM Coordinates: 7597608.8N 407870.7E Zone 12

Sample #: MW-8 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: Ponded water approximately 12 m from well

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.75 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.55 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.555

Depth to Water (From Top of Pipe) (m): 1.202

Calculated Static Water Level (mbgs): 0.647

Well Refusal Depth (m): 2.515 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.313 Water Volume (L): 2.626 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
16:33	10.03	1690	4.7	4.03
16:38	8.82	1630	0.8	4.42
16:43	8.60	1610	0.6	4.21
16:48	8.22	1600	0.4	4.20
16:53	8.21	1600	0.2	4.19
16:58	8.21	1600	0.1	4.20
Final Time: 16:58 Final Values:	8.21	1600	0.1	4.2

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: 2019-08-16 Time: 8:40

Weather: Overcast, Light Rain, Windy, High 9°C, Low 3°C

Monitoring Well ID: MW-9 UTM Coordinates: 7597448.0N 409519.9E Zone 12

Sample #: Not Sampled Duplicate #: None

Bottles Filled (by Parameter Type): ☐ PHC F1 ☐ Metals ☐ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☐ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Damage to hinge - hinge is still functional, and no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.93 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.73 Screen Length (m): 0.3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.42

Depth to Water (From Top of Pipe) (m): No liquid water

Calculated Static Water Level (mbgs): NA

Well Refusal Depth (m): 1.035 (Measure Refusal After Sampling)

Thickness of Water Column (m): N/A Water Volume (L): N/A (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☐ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details:

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☐ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 0 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
NOT SAMPLED - NO LIQUID WATER IN WELL				
Final Time: Final Values:				

Clear? ☐ Y ☐ N Colour:

PHC Sheen? ☐ Y ☐ N PHC Odour? ☐ Y ☐ N

Free Product/PHC Globules? ☐ Y ☐ N Other Odour?

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☐ Y ☐ N Decon Required? ☐ Y ☐ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: 2019-08-16 Time: 15:55

Weather: Overcast, Light Rain, Windy, High 9°C, Low 3°C

Monitoring Well ID: MW-10 UTM Coordinates: 7597315.6 N 409449.7E Zone 12

Sample #: MW-10 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Slight restriction in well at approximately 1.5 m btoc - no repair is recommended at this time

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.6 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.5 Screen Length (m): 2.99

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.820

Depth to Water (From Top of Pipe) (m): 1.942

Calculated Static Water Level (mbgs): 1.122

Well Refusal Depth (m): 2.015 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.073 Water Volume (L): 0.146 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☑ Y ☐ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 0.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
15:59	7.85	721	260	5.24
16:04	7.88	676	38.4	4.94
16:09	7.87	676	18.8	4.97
16:14	7.84	674	14.2	4.96
16:19	7.80	671	11.0	4.93
16:24	7.81	670	4.6	4.82
16:29	7.80	670	2.8	4.81
Final Time: 16:29 Final Values:	7.80	670	2.8	4.81

Clear? ☑ Y ☐ N Colour: slightly brown

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: 2019-08-16 Time: 13:55

Weather: Overcast, Light Rain, Windy, High 9°C, Low 3°C

Monitoring Well ID: MW-11 UTM Coordinates: 7597306.7 N 409521.1 E Zone 12

Sample #: MW-11 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.83 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.74 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.440

Depth to Water (From Top of Pipe) (m): 1.523

Calculated Static Water Level (mbgs): 1.083

Well Refusal Depth (m): 1.785 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.262 Water Volume (L): 0.524 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 1.8 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
13:58	8.24	864	2.3	4.20
14:03	7.68	871	2.1	4.01
14:08	7.65	883	1.9	3.64
14:13	7.82	881	0.0	3.60
14:18	7.79	882	0.0	3.62
14:23	7.80	881	0.0	3.61
Final Time: 14:23 Final Values:	7.80	881	0.0	3.61

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: 2019-08-16 Time: 14:50

Weather: Overcast, Light Rain, Windy, High 9°C, Low 3°C

Monitoring Well ID: MW-12 UTM Coordinates: 7597310.3 N 409594.1 E Zone 12

Sample #: MW-12 Duplicate #: MW-17

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.7 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.56 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.665

Depth to Water (From Top of Pipe) (m): 1.775

Calculated Static Water Level (mbgs): 1.110

Well Refusal Depth (m): 2.128 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.353 Water Volume (L): 0.706 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.4 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
14:56	5.32	1640	1.4	4.99
15:01	7.82	1610	0.0	5.08
15:06	7.72	1620	0.0	4.98
15:11	7.65	1620	0.0	4.98
15:16	7.64	1620	0.0	5.00
15:21	7.65	1620	0.0	4.99
Final Time: 15:21 Final Values:	7.65	1620	0.0	4.99

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-08-18 Time: 10:41

Weather: Party Cloudy, High 10°C, Low 3°C

Monitoring Well ID: MW-13 UTM Coordinates: 7597598.5 N 408881.7 E Zone 12

Sample #: MW-13 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.92 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.59 Screen Length (m): 3.33

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.345

Depth to Water (From Top of Pipe) (m): 1.655

Calculated Static Water Level (mbgs): 1.310

Well Refusal Depth (m): 3.059 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.404 Water Volume (L): 2.808 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
10:46	7.77	680	3.1	3.81
10:51	7.95	663	1.0	3.89
10:56	7.91	662	0.7	3.95
11:01	7.92	661	0.3	3.97
11:06	7.93	663	0.0	3.96
11:11	7.93	662	0.0	3.95
Final Time: 11:11 Final Values:	7.93	662	0	3.95

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-08-18 Time: 11:55

Weather: Party Cloudy, High 10°C, Low 3°C

Monitoring Well ID: MW-14 UTM Coordinates: 7597655.5 N 408811.7 E Zone 12

Sample #: MW-14 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.74 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.65 Screen Length (m): 3.33

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.535

Depth to Water (From Top of Pipe) (m): 1.135

Calculated Static Water Level (mbgs): 0.600

Well Refusal Depth (m): 3.531 (Measure Refusal After Sampling)

Thickness of Water Column (m): 2.396 Water Volume (L): 4.792 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
11:58	7.50	2070	1.5	8.27
12:03	7.70	2070	2.0	8.13
12:08	7.69	2130	0.7	7.40
12:13	7.74	2120	0.3	7.00
12:18	7.73	2120	0.0	7.02
12:23	7.72	2119	0.0	7.01
Final Time: 12:23 Final Values:	7.72	2119	0.0	7.01

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-08-18 Time: 12:50

Weather: Party Cloudy, High 10°C, Low 3°C

Monitoring Well ID: MW-15 UTM Coordinates: 7597591.9 N 408760.3 E Zone 12

Sample #: MW-15 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.75 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.48 Screen Length (m): 3.02

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.555

Depth to Water (From Top of Pipe) (m): 1.520

Calculated Static Water Level (mbgs): 0.965

Well Refusal Depth (m): 2.782 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.262 Water Volume (L): 2.524 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
12:53	7.39	1590	0.3	12.69
12:58	7.23	1460	2.4	11.97
13:03	7.18	1310	1.8	11.51
13:08	7.14	1250	0.0	11.34
13:13	7.13	1190	0.0	11.30
13:18	7.13	1200	0.0	11.28
13:23	7.14	1190	0.0	11.27
Final Time: 13:23 Final Values:	7.14	1190	0.0	11.27

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-08-18 Time: 9:35

Weather: Party Cloudy, High 10°C, Low 3°C

Monitoring Well ID: MW-16 UTM Coordinates: 7597552.6 N 408801.9 E Zone 12

Sample #: MW-16 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.45 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.37 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.755

Depth to Water (From Top of Pipe) (m): 1.160

Calculated Static Water Level (mbgs): 0.405

Well Refusal Depth (m): 4.147 (Measure Refusal After Sampling)

Thickness of Water Column (m): 2.987 Water Volume (L): 5.974 (Calculated)

Free Product Thickness (mm): none Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
9:40	8.72	724	18.1	8.87
9:45	8.46	790	8.6	6.14
9:50	8.25	793	6.3	6.03
9:55	8.19	793	2.4	5.39
10:00	8.16	793	0.2	5.40
10:05	8.15	793	0.0	5.39
10:10	8.15	792	0.1	5.38
Final Time: 10:10 Final Values:	8.15	792	0.1	5.38

Clear? ☑ Y ☐ N Colour: colourless

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

APPENDIX E

Field Notes

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: AUG 16, 2019 Time: 8:40

Weather: OVERCAST, LIGHT RAIN, WINDY, HIGH 9°C, LOW 3°C

Monitoring Well ID: MW-9 UTM Coordinates: 20NE12 7597448.0N 409519.9E

Sample #: NOT SAMPLED Duplicate #: NONE

Bottles Filled (by Parameter Type): ☐ PHC F1 ☐ Metals ☐ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☐ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: DAMAGE TO HINGE BOLT STILL FUNCTIONAL

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm / LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.93 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.73 Screen Length (m): 0.3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.42

Depth to Water (From Top of Pipe) (m): NO WATER

Calculated Static Water Level (mbgs): N/A

Well Refusal Depth (m): 1.035 (Measure Refusal After Sampling)

BENTONITE IN WELL (

Thickness of Water Column (m): N/A Water Volume (L): — (Calculated)

Free Product Thickness (mm): NONE / N/A Sludge/Silt: ☐ Y ☐ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details:

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☐ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): — (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
NOT SAMPLED - NO WATER IN WELL				
Final Time: Final Values:				

Clear? ☐ Y ☐ N Colour:

PHC Sheen? ☐ Y ☐ N PHC Odour? ☐ Y ☐ N

Free Product/PHC Globules? ☐ Y ☐ N Other Odour?

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: WIDE ANGLE & CLOSE-UP Direction: SOUTH

Scale Indicated? ☐ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: AUG. 16, 2019 Time: 15:55

Weather: OVERCAST, LIGHT RAIN, WINDY, HIGH 9°C, LOW 3°C

Monitoring Well ID: MW-10 UTM Coordinates: ZONE 12 7597315.6 N 409449.7 E

Sample #: MW-10 Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ~~☒ Other: Nalisoa~~ ☐ None

Name(s) of Sampler(s): Elliott Holden EH

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: SLIGHT RESTRICTION IN WELL @ ~1.5 m btoc

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm, LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.6 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.5 Screen Length (m): 2.99

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.820

Depth to Water (From Top of Pipe) (m): 1.942

Calculated Static Water Level (mbgs): ~~0.A~~ 1.122

Well Refusal Depth (m): 2.015 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.073 Water Volume (L): 0.146 (Calculated)

Free Product Thickness (mm): N/A Sludge/Silt: ☒ Y ☐ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 0.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
15:59	7.85	721	260	5.24
16:04	7.88	676	38.4	4.94
16:09	7.87	676	18.8	4.97
16:14	7.84	674	14.2	4.96
16:19	7.80	671	11.0	4.93
16:24	7.81	670	4.6	4.82
16:29	7.80	670	2.8	4.81
Final Time: 16:29 Final Values:	7.80	670	2.8	4.81

Clear? ☒ Y ☐ N Colour: SLIGHT BROWN COLOUR

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: NE

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: AUG. 16, 2019 Time: 13:55

Weather: OVERCAST, LIGHT RAIN, WINDY, HIGH 9°C, LOW 3°C

Monitoring Well ID: MW-11 UTM Coordinates: 20NE 12 7597306.7N 409521.1E

Sample #: MW-11 Duplicate #: N/A

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ~~☒ Other: NaOH~~ ☐ None

Name(s) of Sampler(s): Elliott Holden SH

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm, ~~LOCK~~ WELL WAS REPLACED SH

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.83 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.74 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.440

Depth to Water (From Top of Pipe) (m): 1.523

Calculated Static Water Level (mbgs): 1.083

Well Refusal Depth (m): 1.785 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.262 Water Volume (L): 0.524 (Calculated)

Free Product Thickness (mm): NA Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 1.8 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
13:58	8.24	864	2.3	4.20
14:03	7.68	871	2.1	4.01
14:08	7.65	883	1.9	3.64
14:13	7.82	881	0.0	3.60
14:18	7.79	882	0.0	3.62
14:23	7.80	881	0.0	3.61
Final Time: 14 23 Final Values:	7.80	881	0.0	3.61

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: NW, N, NE

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Tier II Disposal Facility

Date: AUG. 16, 2019 Time: 14:50

Weather: OVERCAST, LIGHT RAIN, WINDY, HIGH 9°C, LOW 3°C

Monitoring Well ID: MW-12 UTM Coordinates: 2CNE12, 7597310.3N, 409594.1E

Sample #: MW-12 Duplicate #: MW-17

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ~~☒ Other: Ascorbic Acid~~ ☐ None

Name(s) of Sampler(s): Elliott Holden EH

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.7 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.56 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.665

Depth to Water (From Top of Pipe) (m): 1.775

Calculated Static Water Level (mbgs): 1.110

Well Refusal Depth (m): 2.128 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.353 Water Volume (L): 0.706 (Calculated)

Free Product Thickness (mm): NA Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.4 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
14:56	5.32	164.0	1.4	4.99
15:01	7.82	161.0	0.0	5.08
15:06	7.72	162.0	0.0	4.98
15:11	7.65	162.0	0.0	4.98
15:16	7.64	162.0	0.0	5.00
15:21	7.65	162.0	0.0	4.99
Final Time: 15:21 Final Values:	7.65	162.0	0.0	4.99

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: NW, N, NE

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL EH

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Lanfill

Date: 2019-08-17 Time: 14:39

Weather: SUNNY, HIGH 11°C, LOW 1°C.

Monitoring Well ID: MW-5 UTM Coordinates: ZONE 12 7597694.1N, 408046.3E

Sample #: MW-5 Duplicate #: N/A

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ~~☒ Other: $NaHSO_4$~~ ☐ None

Name(s) of Sampler(s): Elliott Holden SH

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm, LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.9 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.57 Screen Length (m): 3.33

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.442

Depth to Water (From Top of Pipe) (m): 1.847

Calculated Static Water Level (mbgs): 1.405

Well Refusal Depth (m): 3.021 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.174 Water Volume (L): 2.348 (Calculated)

Free Product Thickness (mm): 0 N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
14:42	8.78	567	1.6	9.72
SH NB 14:52	8.27	583	0.4	8.55
14:57	8.22	585	0.0	7.23
15:02	8.19	586	0.0	6.27
15:07	8.16	586	0.1	6.21
15:12	8.16	586	0.1	6.19
15:17	8.15	587	0.1	6.20
Final Time: 15:17 Final Values:	8.15	587	0.1	6.20

Clear? ☒ Y ☐ N Colour: SLIGHTLY BROWN

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: NW, W, S

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Lanfill

Date: 2019-08-17 Time: 15:23

Weather: SUNNY, HIGH 11°C, LOW 1°C

Monitoring Well ID: MW-6 UTM Coordinates: ZONE 12, 7597730.9 N, 407854.9 E

Sample #: MW-6 Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☒ Other: ~~H_2SO_4~~ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.73 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.53 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.565

Depth to Water (From Top of Pipe) (m): 1.653

Calculated Static Water Level (mbgs): 1.088

Well Refusal Depth (m): 2.785 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.132 Water Volume (L): 2.264 (Calculated)

Free Product Thickness (mm): ~~0~~ N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.4 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
15:28	7.91	796	0.0	7.97
15:33	7.85	874	0.0	7.32
15:38	7.85	909	0.0	7.29
15:43	7.86	918	0.0	7.01
15:48	7.84	918	0.0	6.88
15:53	7.84	919	0.0	6.72
Final Time: 15:53 Final Values:	7.84	919	0.0	6.72

Clear? ☒ Y ☐ N Colour: SLIGHTLY BROWN

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: NE, S

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 | Landfill Name: Main Lanfill

Date: 2019-08-17 | Time: 4:02 PM 16:02

Weather: SUNNY, HIGH 11°C, LOW 1°C

Monitoring Well ID: MW-7 | UTM Coordinates: 20NE 12, 7597686.4N 407914.5E

Sample #: MW-7 | Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ~~☒ Other: $NaHSO_4$~~ ☐ None EA

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm, REPLACED LOCK

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.8 | Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.6 | Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.315

Depth to Water (From Top of Pipe) (m): 2.186

Calculated Static Water Level (mbgs): 1.871

Well Refusal Depth (m): 2.771 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.585 | Water Volume (L): 1.17 (Calculated)

Free Product Thickness (mm): 0 | Sludge/Silt: ☒ Y ~~☒ N~~ EA

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 | Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N | Purge Rate: ☒ < Recharge Rate ☒ > Recharge Rate

Total Volume Purged (L): 1.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
2019-8-17 16:04	9.91	674	41.2	6.25
16:09	12.11	436	15.5	6.21
16:14	11.83	425	9.3	6.22
2019-8-18	WELL WENT DRY			
~~2019-8-18~~ 18:23	8.75	410	0.5	4.35
EA 18:28	8.23	411	0.2	4.31
Final Time: 18:28 Final Values:	8.23	411	0.2	4.31

Clear? ☒ Y ☐ N | Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N | PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N | Other Odour?

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N | Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A | # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: | Direction: E, SE, N

Scale Indicated? ☒ Y ☐ N | Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Main Lanfill

Date: 2019-8-17 Time: 4:30 PM 16:30

Weather: SUNNY, HIGH 11°C, LOW 1°C. EH EH

Monitoring Well ID: MW-8 UTM Coordinates: ZONE 12 ~~7597666.4 N, 407914.5 E~~

Sample #: MW-8 Duplicate #: NONE 7597608.8 N, 407870.7E

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ~~☒ Other: $NaHSO_4$~~ ☐ None

Name(s) of Sampler(s): Elliott Holden EH

Ponded Water, Snow Depth, etc.: N PONDED WATER APPROX. 12 M FROM WELL

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.75 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.55 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.555

Depth to Water (From Top of Pipe) (m): 1.202

Calculated Static Water Level (mbgs): 0.647

Well Refusal Depth (m): 2.515 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.313 Water Volume (L): 2.626 (Calculated)

Free Product Thickness (mm): Ø N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
EH 16:33	10.03	1690	4.7	4.04
16:38	8.82	1630	0.8	4.42
16:43	8.60	1610	0.6	4.21
16:48	8.22	1600	0.4	4.20
16:53	8.21	1600	0.2	4.19
16:58	8.21	1600	0.1	4.20
Final Time: 16:58 Final Values:	8.21	1600	0.1	4.20

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: E, S, W, N, EH

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-8-18 Time: 10:41

Weather: PARTLY CLOUDY, HIGH 10°C, LOW 3°C

Monitoring Well ID: MW-13 UTM Coordinates: ZONE 12, 7597598.5 N, 408881.7 E

Sample #: MW-13 Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.92 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.59 Screen Length (m): 3.33

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.345

Depth to Water (From Top of Pipe) (m): 1.655

Calculated Static Water Level (mbgs): 1.310

Well Refusal Depth (m): 3.059 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.404 Water Volume (L): 2.808 (Calculated)

Free Product Thickness (mm): Ø N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
10:46	7.77	660	3.1	3.81
10:51	7.95	663	1.0	3.89
10:56	7.91	662	0.7	3.95
11:01	7.92	661	0.3	3.97
11:06	7.93	663	0.0	3.96
11:11	7.93	662	0.0	3.95
Final Time: 11:11 Final Values:	7.93	662	0.0	3.95

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: W, N S

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-8-18 Time: 11:55

Weather: PARTLY CLOUDY, HIGH 10°C, LOW 3°C.

Monitoring Well ID: MW-14 UTM Coordinates: ZONE 12, 7597655, 5N, 408811.7E

Sample #: MW-14 Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm, LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.74 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.65 Screen Length (m): 3.33

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.535

Depth to Water (From Top of Pipe) (m): 1.135

Calculated Static Water Level (mbgs): 0.600

Well Refusal Depth (m): 3.531 (Measure Refusal After Sampling)

Thickness of Water Column (m): 2.396 Water Volume (L): 4.792 (Calculated)

Free Product Thickness (mm): Ø N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
11:58	7.50	2070	1.5	8.27
12:03	7.70	2070	2.0	8.13
12:08	7.69	2130	0.7	7.40
12:13	7.74	2120	0.3	7.00
12:18	7.73	2120	0.0	7.02
12:23	7.72	2119	0.0	7.01
Final Time: 12:23 Final Values:	7.72	2119	0.0	7.01

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: S, W

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019.8.12 Time: 12:50

Weather: PARTLY CLOUDY, HIGH 10°C, LOW 3°C

Monitoring Well ID: MW-15 UTM Coordinates: ZONE 12, 7597591.9N, 408760.3E

Sample #: MW-15 Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.75 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.48 Screen Length (m): 3.02

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.555

Depth to Water (From Top of Pipe) (m): 1.520

Calculated Static Water Level (mbgs): 0.965

Well Refusal Depth (m): 2.782 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.262 Water Volume (L): 2.524 (Calculated)

Free Product Thickness (mm): Ø N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ ≤ Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
12:53	7.39	1590	0.3	12.69
12:58	7.23	1460	2.4	11.97
13:03	7.18	1310	1.8	11.51
13:08	7.14	1250	0.0	11.34
13:13	7.13	1190	0.0	11.30
13:18	7.13	1200	0.0	11.28
13:23	7.14	1190	0.0	11.27
Final Time: 13:23 Final Values:	7.14	1190	0.0	11.27

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? _____

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: N, E, S

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

PIN-3: Monitoring Well Sampling Log

Site Name: PIN-3 Landfill Name: Non-Hazardous Waste Landfill

Date: 2019-8-18 Time: 9:35

Weather: PARTLY CLOUDY, HIGH 10°C, LOW 3°C

Monitoring Well ID: MW-16 UTM Coordinates: 20NE12, 7597552.6N, 408801.9E

Sample #: MW-16 Duplicate #: NONE

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☒ ~~Other:~~ SA ☐ None

Name(s) of Sampler(s): Elliott Holden

Ponded Water, Snow Depth, etc.: NONE

Well Condition/Repair Requirements: GOOD

Lock Make/Model/Condition/Replaced: G. Hjukstrom Limited, 7000PS-KA3, 40mm, LOCK WAS REPLACED

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.45 Diameter (cm): 5 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.37 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other

Well Stickup (Ground to Top of Pipe) (m): 0.755

Depth to Water (From Top of Pipe) (m): 1.160

Calculated Static Water Level (mbgs): 0.405

Well Refusal Depth (m): 4.147 (Measure Refusal After Sampling)

Thickness of Water Column (m): 2.987 Water Volume (L): 5.974 (Calculated)

Free Product Thickness (mm): 0 N/A Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U52-2 Calibration Details: FACTORY

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
9:40	8.72	724	18.1	8.87
9:45	8.46	790	8.6	6.14
9:50	8.25	793	6.3	6.03
9:55	8.19	793	2.4	5.39
10:00	8.16	793	0.2	5.40
10:05	8.15	793	0.0	5.39
10:10	8.15	792	0.1	5.38
Final Time: 10:10 Final Values:	8.15	792	0.1	5.38

Clear? ☒ Y ☐ N Colour: COLOURLESS

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? NONE

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction: E, N, W

Scale Indicated? ☒ Y ☐ N Line of Sight: FROM WELL TO LANDFILL

Kitik16 - 2019 - PIN-3 Soil Sampling Log

Site Name: PIN-3

Landfill Name: **Tier II Disposal Facility**

Date & Time of Sampling Event: 2019 · 08 - 16 9:30

Weather: OVERCAST, LIGHT RAIN, WINDY, HIGH 9°C LOW 3°C, 35 KM/HR WIND

Name of Sampling Staff: Elliott Holden

Sampling Equipment and Decontamination Methods: (1) Steel shovel used to dig hole (2) Alconox and distilled water used for decontamination

Soil Sampling Location ID	UTM Coordinates ZONE 12 North (m)	UTM Coordinates ZONE 12 East (m)	Sample Depth	Notes: *Including (but not limited to): visual/olfactory observations (colour, odour, evidence of contamination), depth and reason for refusal if required depth not achieved, any preservation of PHC samples (type of preservative used for which fraction(s) of PHC)*	**Photos:** *number/ID; close up/wide angle/panoramic; location relative to monument/feature view direction relative to magnetic north; line of sight (looking from X to Y); include indication of scale*
MW-9 A	7597450.4	409518.7	0 - 0.15	SAND AND GRAVEL, TRACE ORGANICS, ROOTLETS, BROWN, DRY	WIDE ANGLE S, CLOSE UP.
9:40 B			0.4 - 0.5	SAND AND GRAVEL, SOME COBBLE, BROWN, DRY	
MW-10 A	7597315.2	409447.4	0 - 0.15	SAND AND ORGANICS, ~~SOME~~ TRACE GRAVEL, ROOTLETS, BROWN TO GREYISH BROWN, DRY	WIDE ANGLE NE CLOSE UP.
10:10 B			0.4 - 0.5	SAND, SOME GRAVEL, GREYISH BROWN DRY	
MW-11 A	7597304.7	409522.9	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL, ROOTLETS, BROWN TO GREYISH BROWN, DRY	WIDE ANGLE NW CLOSE UP.
10:30 B			0.4 - 0.5	SAND, SOME GRAVEL, GREYISH BROWN, DRY	
MW-12 A	7597308.4	409595.9	0 - 0.15	SAND AND DARK BROWN ORGANICS, SOME GRAVEL, ROOTLETS, GREYISH BROWN, DRY	WIDE ANGLE NW CLOSE UP.
11:00 B			0.4 - 0.5	SAND AND SOME GRAVEL, GREYISH BROWN, DRY	
MW-17B			0.4 - 0.5	DUPLICATE OF MW-12B	
				*PHC F1 SAMPLES WERE PRESERVED WITH METHANOL AT ALL SAMPLE LOCATIONS.	

Kitik16 - 2019 - PIN-3 Soil Sampling Log

Site Name: PIN-3

Landfill Name: **Main Landfill**

Date & Time of Sampling Event: 2019 - 08 - 17 8:50

Weather: SUNNY HIGH 11 °C LOW 1 °C WIND 33 KM/HR

Name of Sampling Staff: Elliott Holden

Sampling Equipment and Decontamination Methods: (1) Steel shovel used to dig hole (2) Alconox and distilled water used for decontamination

Soil Sampling Location ID	UTM Coordinates ZONE 12 North (m)	UTM Coordinates ZONE 12 East (m)	Sample Depth	*Notes: Including (but not limited to): visual/olfactory observations (colour, odour, evidence of contamination), depth and reason for refusal if required depth not achieved, any preservation of PHC samples (type of preservative used for which fraction(s) of PHC)	Photos: number/ID; close up/wide angle/panoramic; location relative to monument/feature view direction relative to magnetic north; line of sight (looking from X to Y); include indication of scale
MW-5 A 9:20 B	7597692.97	408044.9	0 - 0.15	GRAVEL (ANGULAR) AND SAND, FEW COBBLES, TRACE ORGANICS, ROOTLETS, GREYISH BROWN, DRY	WIDE ANGLE NE AND NW, CLOSE-UP, REF. SCALE IN PHOTOS
			0.4 - 0.5	SAND, SOME GRAVEL, GREYISH BROWN, DRY	
MW-6 A 9:40 B	7597730.6	407852.5	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL, ROOTLETS SAND = GREYISH BROWN, ORGANICS = BROWN, DRY	WIDE ANGLE NE, CLOSE-UP REF. SCALE IN PHOTOS
			0.4 - 0.45	SAND, SOME GRAVEL, TRACE COBBLE, GREYISH BROWN, DRY REFUSAL ON BEDROCK	
MW-7 A 10:00 B	7597685.7	407910.2	0 - 0.15	SAND AND ANGULAR GRAVEL, SOME COBBLE, TRACE ORGANICS ROOTLETS, GREYISH BROWN DRY	WIDE ANGLE E, CLOSE-UP REF. SCALE IN PHOTOS
			0.2 - 0.3	SAND AND ANGULAR GRAVEL, SOME COBBLE, GREYISH BROWN, DRY, REFUSAL ON BEDROCK	
MW-8 A 10:20 B	7597610.1	407868.6	0 - 0.15	GREYISH BROWN SAND AND BROWN ORGANICS, TRACE GRAVEL, ROOTLETS, MOIST	WIDE ANGLE SE AND E, CLOSE-UP, REF. SCALE IN PHOTOS
			0.4 - 0.5	SAND, TRACE GRAVEL, GREYISH BROWN, MOIST, ~~REFUSAL ON BEDROCK~~ 2/2	
				*FIPHC SAMPLES WERE PRESERVED WITH METHANOL AT ALL SAMPLE LOCATIONS	

Kitik16 - 2019 - PIN-3 Soil Sampling Log

Site Name: PIN-3

Landfill Name: **NWS Landfill**

Date & Time of Sampling Event: 2019-08-17 17:30

Weather: SUNNY HIGH 11°C LOW 1°C, WIND 33 KM/HR

Name of Sampling Staff: Elliott Holden

Sampling Equipment and Decontamination Methods: (1) Steel shovel used to dig hole (2) Alconox and distilled water used for decontamination

Soil Sampling Location ID		UTM Coordinates ZONE 12 North (m)	UTM Coordinates ZONE 12 East (m)	Sample Depth	✳ Notes: *Including (but not limited to): visual/olfactory observations (colour, odour, evidence of contamination), depth and reason for refusal if required depth not achieved, any preservation of PHC samples (type of preservative used for which fraction(s) of PHC)*	**Photos:** *number/ID; close up/wide angle/panoramic; location relative to monument/feature view direction relative to magnetic north; line of sight (looking from X to Y); include indication of scale*
P3-1 18:40	A	7598037.1	408008.3	0 - 0.15	GREYISH BROWN SAND AND BROWN ORGANICS, TRACE GRAVEL ROOTLETS DRY	WIDE ANGLE SE, CLOSE-UP.
	B			0.2 - 0.28	GREYISH BROWN SAND, SOME GRAVEL, TRACE ORGANICS DRY REFUSAL ON BEDROCK	
P3-2 17:40	A	7597935.7	407918.96	0 - 0.15	GREYISH BROWN SAND, SOME GRAVEL AND ORGANICS, TRACE COBBLE, ROOTLETS, DRY	WIDE ANGLE NE, CLOSE-UP.
	B			0.4 - 0.5	GREYISH BROWN SAND AND GRAVEL, TRACE COBBLE, DRY	
P3-3 18:00	A	7598001.8	407875.8	0 - 0.15	SAND AND GRAVEL (GREYISH BROWN), SOME ORGANICS, TRACE COBBLE, ROOTLETS, DRY	WIDE ANGLE N, CLOSE-UP.
	B			0.4 - 0.5	GRAVEL, SOME SAND, TRACE COBBLE, AND ROOTLETS, DRY GREYISH BROWN	
P3-4 18:20	A	7598050.9	407810.5	0 - 0.15	GREYISH BROWN SAND, SOME GRAVEL AND ORGANICS, ROOTLETS, DRY	WIDE ANGLE SE, CLOSE-UP
	B			0.35 - 0.4	GREYISH BROWN SAND AND GRAVEL TRACE COBBLE, DRY	
					✳PHC F1 SAMPLES WERE PRESERVED WITH METHANOL AT ALL SAMPLE LOCATIONS.	

Kitik16 - 2019 - PIN-3 Soil Sampling Log

Site Name: PIN-3

Landfill Name: **Non-Hazardous Waste Landfill**

Date & Time of Sampling Event: 2019 . 08 . 18 9:00

Weather: PARTLY CLOUDY, HIGH 10°C LOW 3°C, WIND 33 KM/HR

Name of Sampling Staff: Elliott Holden

Sampling Equipment and Decontamination Methods: (1) Steel shovel used to dig hole (2) Alconox and distilled water used for decontamination

Soil Sampling Location ID	UTM Coordinates ZONE 12 North (m)	UTM Coordinates ZONE 12 East (m)	Sample Depth	Notes: *Including (but not limited to): visual/olfactory observations (colour, odour, evidence of contamination), depth and reason for refusal if required depth not achieved, any preservation of PHC samples (type of preservative used for which fraction(s) of PHC)*	**Photos:** *number/ID; close up/wide angle/panoramic; location relative to monument/feature view direction relative to magnetic north; line of sight (looking from X to Y); include indication of scale*
MW-13 A	7597602.1	408881.5	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL, ROOTLETS, BROWN, MOIST	WIDE ANGLE SW, CLOSE-UP.
10:10 B			0.4 - 0.5	SAND, SOME GRAVEL AND COBBLE, BROWN, MOIST	
MW-14 A	7597656.5	408814.6	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL ROOTLETS, BROWN, MOIST	WIDE ANGLE SW, CLOSE-UP.
11:10 B			0.2 - 0.3	SAND, SOME GRAVEL AND COBBLE, ROOTLETS, BROWN, MOIST, REFUSAL ON BEDROCK	
MW-15 A	7597589.8	408761.4	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL ROOTLETS BROWN, MOIST	WIDE ANGLE N, CLOSE-UP
12:20 B			0.3 - 0.4	SAND, SOME GRAVEL AND COBBLE, BROWN, ROOTLETS, MOIST, REFUSAL ON BEDROCK	
MW-16 A	7597551.8	408798.9	0 - 0.15	SAND AND GRAVELS, SOME ORGANICS, ROOTLETS TRACE COBBLE, DARK BROWN, MOIST	WIDE ANGLE N, CLOSE-UP.
9:10 B			0.15 - 0.25	SAND AND GRAVEL, SOME COBBLE, TRACE ORGANICS, BROWN, MOIST, REFUSAL ON BEDROCK	
MW-18B			0.4 - 0.5	DUPLICATE OF MW-13B	
MW-19B			0.2 - 0.3	DUPLICATE OF MW-14B	
				* PHC F1 SAMPLES WERE PRESERVED IN METHANOL	

Kitik16 - 2019 - PIN-3 Soil Sampling Log

Site Name: PIN-3

Landfill Name: **South Landfill**

Date & Time of Sampling Event: 2019 - 08 - 18 15:10

Weather: PARTLY CLOUDY HIGH 10°C LOW 3°C WIND 33 KM/HR

Name of Sampling Staff: Elliott Holden

Sampling Equipment and Decontamination Methods: (1) Steel shovel used to dig hole (2) Alconox and distilled water used for decontamination

Soil Sampling Location ID	UTM Coordinates ZONE 12 North (m)	UTM Coordinates ZONE 12 East (m)	Sample Depth	Notes: *Including (but not limited to): visual/olfactory observations (colour, odour, evidence of contamination), depth and reason for refusal if required depth not achieved, any preservation of PHC samples (type of preservative used for which fraction(s) of PHC)*	Photos: *number/ID; close up/wide angle/panoramic; location relative to monument/feature view direction relative to magnetic north; line of sight (looking from X to Y); include indication of scale*
P3-5 A 18:10 B	7596523.2	408686.1	0 - 0.15	SAND AND ORGANICS, TRACE GRAVEL, ROOTLETS, DARK BROWN, MOIST. WATER AT 0.22 mbgs	WIDE ANGLE S, CLOSE UP.
			0.4 - 0.5	LOAMY SAND AND GRAVEL, SOME ORGANICS, DARK BROWN, WET	
P3-6 A 17:00 B	7596462.1	408734.6	0 - 0.15	SAND, SOME GRAVEL, TRACE ORGANICS ROOTLETS, GREYISH BROWN, MOIST, WATER AT 0.33 mbgs	WIDE ANGLE NE, CLOSE UP.
			0.4 - 0.5	SAND, SOME GRAVEL, TRACE COBBLE, ORGANICS, GREYISH BROWN WET.	
P3-7 A 17:20 B	7596420.5	408698.7	0 - 0.15	SAND AND GRAVEL, SOME COBBLE, TRACE ORGANICS, ROOTLETS, GREYISH BROWN, MOIST	WIDE ANGLE N - NE, CLOSE - UP.
			0.4 - 0.5	SAND AND COBBLES, SOME GRAVEL, TRACE ORGANICS, GREYISH BROWN, WET, WATER AT 0.38 mbgs	
P3-8 A 17:50 B	7596468.2	408672.6	0 - 0.15	SAND AND GRAVEL, ROOTLETS, GREYISH BROWN, MOIST	WIDE ANGLE N, CLOSE - UP.
			0.4 - 0.5	SAND AND GRAVEL, SOME COBBLE ROOTLETS, GREYISH BROWN, WET. WATER AT 0.38 mbgs	
P3-9 A 15:20 B	7596505.2	408861.4	0 - 0.15	STRATIFIED SAND AND GRAVEL, ROOTLETS GREYISH BROWN, MOIST	WIDE ANGLE SE, CLOSE-UP.
			0.4 - 0.5	SAND AND COBBLES, SOME GRAVEL GREYISH BROWN, WET, WATER AT 0.34 mbgs	
P3-10 A 15:40 B	7596418.6	408848.6	0 - 0.15	SAND AND GRAVEL, SOME ORGANICS, ROOTLETS, GREYISH BROWN, MOIST	WIDE ANGLE N, CLOSE - UP.
			0.4 - 0.5	SAND AND COBBLES, SOME GRAVEL, TRACE ORGANICS, GREYISH BROWN, WET. WATER AT 0.32 mbgs	
P3-11 A 16:20 B	7596447.1	408798.2	0 - 0.15	SAND AND ORGANICS, SOME SILT, ROOTLETS BROWN, WET, WATER AT 0.03 mbgs	WIDE ANGLE E - NE, CLOSE - UP.
			0.4 - 0.5	LOAMY SAND, SOME GRAVEL AND COBBLES, DARK GREY ORGANICS, WET	
P3-19B			0.4 - 0.5	DUPLICATE OF P3 - 11B	

* PHC F1 SAMPLES WERE PRESERVED IN METHANOL

Kitik16 - 2019 - PIN-3 Soil Sampling Log

Site Name: PIN-3

Landfill Name: **North Landfill**

Date & Time of Sampling Event: 2019 · 08 - 18 20:10

Weather: PARTLY CLOUDY, HIGH 10°C, LOW 3°C, WIND 33 KM/HR

Name of Sampling Staff: Elliott Holden

Sampling Equipment and Decontamination Methods: (1) Steel shovel used to dig hole (2) Alconox and distilled water used for decontamination

Soil Sampling Location ID	UTM Coordinates ZONE 12 North (m)	UTM Coordinates ZONE 12 East (m)	Sample Depth	Notes: *Including (but not limited to): visual/olfactory observations (colour, odour, evidence of contamination), depth and reason for refusal if required depth not achieved, any preservation of PHC samples (type of preservative used for which fraction(s) of PHC)*	Photos: *number/ID; close up/wide angle/panoramic; location relative to monument/feature view direction relative to magnetic north; line of sight (looking from X to Y); include indication of scale*
P3-12 A	7598703.6	408584.2	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL, TRACE COBBLE, ROOTLETS, BROWN, DRY	WIDE ANGLE NE, CLOSE-UP.
20:20 B			0.25 - 0.33	SAND AND GRAVEL, SOME COBBLE, TRACE ORGANICS, GREYISH BROWN, DRY, REFUSAL ON BEDROCK	
P3-13 A	7598716.6	408494.9	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL AND COBBLE, BROWN, ROOTLETS, DRY	WIDE ANGLE E, SW CLOSE-UP.
20:40 B			0.15 - 0.2	COBBLES, SOME GRAVEL AND SAND, TRACE ORGANICS, ROOTLETS, GREYISH BROWN, DRY, REFUSAL ON BEDROCK	
P3-14 A	7598745.6	408542.5	0 - 0.15	SAND AND ORGANICS, SOME GRAVEL AND COBBLE, ROOTLETS, BROWN, DRY	WIDE ANGLE SW, CLOSE-UP.
21:00 B			0.15 - 0.2	COBBLE, SOME GRAVEL AND SAND, TRACE ORGANICS, ROOTLETS, GREYISH BROWN, DRY, REFUSAL ON BEDROCK	
P3-15 A	7598736.3	408596.97	0 - 0.15	SAND AND GRAVEL, SOME BROWN ORGANICS, ROOTLETS, GREYISH BROWN, DRY	WIDE ANGLE S, CLOSE-UP.
21:20 B			0.25 - 0.35	SAND AND GRAVEL, SOME COBBLE, GREYISH BROWN, ROOTLETS, DRY REFUSAL ON BEDROCK	
P3-16 A	7598732.0	408638.1	0 - 0.15	GRAVEL AND COBBLE, SOME SAND AND ORGANICS, ROOTLETS, BROWN, DRY	WIDE ANGLE S, CLOSE-UP
21:40 B			0.25 - 0.35	COBBLE AND GRAVEL, SOME SAND, TRACE ORGANICS, GREYISH BROWN, DRY, REFUSAL ON BEDROCK	
P3-17A			0 - 0.15	DUPLICATE OF P3-13A	
P3-18A			0 - 0.15	DUPLICATE OF P3-16A	
				PHC F1 SAMPLES WERE PRESERVED WITH METHANOL AT ALL SAMPLE LOCATIONS.	

ANNEX M: Thermistor Inspection Template

Inspector Name: ELLIOTT HOLDEN	Inspection Date: 2019-8-19
Inspector Signature: EH	*Previous Inspection Date: 2014-8-17

Thermistor Information

*Site Name: PIN-3	*Landfill: MAIN LANDFILL
*Thermistor #: VT-1	Inclination: X Vertical ☐ Inclined
ZONE 12 *Northing: 7597714.8	*Easting: 407967.9
*Installation Date: 2004-9-5	*Year 1 Monitoring Date: 2007-8-23
Datalogger Model #: RX-16 REVISION 17-C	Datalogger Cable Model: ☐ USB X Serial Port
Datalogger Serial #: 108043	Datalogger Cable Too Short?: ☐ Y X N
*Elevation (masl): ~~11.00~~ 10.714 EH	Extension Cable Required (m): X N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	X	☐	
Cover/Lid Integrity	X	☐	
Datalogger Functionality	X	☐	
Cable Functionality	X	☐	
Bead Functionality	X EH	X	BEADS 12,13,14,15,16 NOT WORKING

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	X	☐		
Was a poorly functioning lock removed?	X	☐		
Was a new 7000PS-KA3 lock put in place?	X	☐	☐	If no, model:

TIME ON LOGGER WAS OFF

Batteries		Yes	No	N/A	Details LOCAL 11:20 LOGGER 9:25
Batteries Found In Datalogger	Was datalogger functional upon arrival?	X	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB1
	Battery installation date:				2014-8-14
	Battery levels:				Main: 11.34 V Auxiliary: 13.14 V
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	X	☐		If yes, models: ULB-15 AND ULB1
	New battery levels:			☐	Main: 11.34 V Auxiliary: 13.14 V
	Was desiccant replaced?	X	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 06 2026
	Was datalogger functional upon departure?	X	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	X	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	11.554	
2	13.024	
3	14.545	
4	15.888	
5	16.880	
6	17.646	
7	19.098	
8	20.19	

Bead	ohms	°C
9	21.05	
10	22.22	
11	22.70	
* 12	1.838	
* 13	1.896	
* 14	1.884	
* 15	1.956	
* 16	1.951	

Datalogger Programming and Maintenance

Data collection frequency: 4E HRS
Data collection time: NOON
Maintenance requirements: NONE

CLAG: 2.6 M

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: ELLIOTT HOLDEN	Inspection Date: 2019 - E - 19
Inspector Signature: EH	*Previous Inspection Date: 2014 - 8 - 17

Thermistor Information

*Site Name: PIN-3	*Landfill: MAIN LANDFILL
*Thermistor #: VT-2	Inclination: X Vertical ☐ Inclined
ZONE 12 *Northing: 7597735.4	*Easting: 407878.8
*Installation Date: 2014-09-05	*Year 1 Monitoring Date: 2007-08-23
Datalogger Model #: RX-16 REVISION 17-C	Datalogger Cable Model: ☐ USB X Serial Port
Datalogger Serial #: 111103	Datalogger Cable Too Short?: ☐ Y X N
*Elevation (masl): 7.92	Extension Cable Required (m): X N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	X	☐	
Cover/Lid Integrity	X	☐	
Datalogger Functionality	X	☐	
Cable Functionality	X	☐	
Bead Functionality	X EH	X	BEADS 15 AND 16 NOT WORKING

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	X	☐		
Was a poorly functioning lock removed?	X	☐		
Was a new 7000PS-KA3 lock put in place?	X	☐	☐	If no, model:

Batteries

TIME ON LOGGER WAS OFF

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	X	☐		LOCAL 11:44 LOGGER 9:38
	Battery models:				Main: ULB-15 Auxiliary: ULB1
	Battery installation date:				2014-08-17
	Battery levels:				Main: 11.34 V Auxiliary: 13.63 V
	Memory battery best before date:				JULY 2025 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	X	☐		If yes, models: ULB-15 AND ULB1
	New battery levels:			☐	Main: 11.34 V Auxiliary: 13.63 V
	Was desiccant replaced?	X	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 06 2026
	Was datalogger functional upon departure?	X	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	X	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	10.054	
2	10.203	
* 3	10.085	
4	10.907	
5	11.257	
6	12.508	
7	13.907	
8	15.553	

Bead	ohms	°C
9	16.639	
10	17.331	
11	17.965	
12	18.685	
13	19.227	
14	19.83	
X 15	4.602	
X 16	5.741	

Datalogger Programming and Maintenance

Data collection frequency: 48 HRS
Data collection time: NOON
Maintenance requirements: NONE

CLAG 4.6 M

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name:	ELLIOTT HOLDEN	Inspection Date:	2019-8-19
Inspector Signature:	EH	*Previous Inspection Date:	2014-8-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	MAIN LANDFILL
*Thermistor #:	VT-3	Inclination:	☒ Vertical ☐ Inclined
Z 12 *Northing:	7597635.8 N	*Easting:	407963.8
*Installation Date:	2004-9-5	*Year 1 Monitoring Date:	2007.8 23
Datalogger Model #:	RX-16 REVISION 17-C	Datalogger Cable Model:	☐ USB ☒ Serial Port
Datalogger Serial #:	111108	Datalogger Cable Too Short?:	☐ Y ☒ N
*Elevation (masl):	10.014	Extension Cable Required (m):	☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☐	☒	
Cable Functionality	☒	☐	BEADS 12 TO 16 NOT WORKING
Bead Functionality	~~☒~~ EH	☒	~~BEADS 13, 14, 15, 16 ON LOGGER NOT WORKING~~ EH

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		DATALOGGER TIME WAS OFF: 7:20 LOCAL 10:15
	Battery models:				Main: ULB-15 Auxiliary: ULB1
	Battery installation date:				2014-08-17
	Battery levels:				Main: 11.34 V Auxiliary: 13.38 V
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☐		If yes, models:
	New battery levels:			☐	Main: Auxiliary:
	Was desiccant replaced?	☐	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 20__
	Was datalogger functional upon departure?	☐	☒		If no, brought south for repairs? ☒ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

ERROR: BOTH BANKS OF THE MULTIPLEXER COULD NOT BE READ

COULD NOT DOWN LOAD DATA

Bead	ohms	°C
1	11.509	
2	12.979	
3	14.483	
4	15.790	
5	16.849	
6	17.713	
7	19.183	
8	20.16	

Bead	ohms	°C
9	21.33	
10	22.26	
11	22.80	
* 12	2.479	
* 13	2.146	
* 14	2.483	
* 15	2.421	
* 16	2.325	

Datalogger Programming and Maintenance

REPLACEMENT DATALOGGER 02020270

Data collection frequency: 48 Hrs
Data collection time: NOON
Maintenance requirements:

DATE WHEN MEMORY FULL: 19/05/2024
MAIN 11.34 V AUX. 13.14 V

CLAG = 2.5 M

REPLACE BATTERIES BY: 06/2026
NEW ULB-15, ULB1, AND DESICCANT WERE INSTALLED IN REPLACEMENT LOGGER

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: ELLIOT HOLDEN	Inspection Date: 2019-8-19
Inspector Signature: EH	*Previous Inspection Date: 2014-8-17

Thermistor Information

*Site Name: PIN-3	*Landfill: MNN LANDFILL
*Thermistor #: VT-4	Inclination: ☒ Vertical ☐ Inclined
Z12 *Northing: 7597625.0	*Easting: 407899.6
*Installation Date: 2004-09-05	*Year 1 Monitoring Date: 2007-08-23
Datalogger Model #: RX-16 REVISION H-C	Datalogger Cable Model: ☐ USB ☒ Serial Port
Datalogger Serial #: 108093	Datalogger Cable Too Short?: ☐ Y ☒ N
*Elevation (masl): 7.82	Extension Cable Required (m): ☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☐	☐	
Cable Functionality	☒	☐	
Bead Functionality	☒ EH	☒	READS 13 14 15, 16 LOGGER NOT WORKING

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

TIME ON DATALOGGER WAS OFF

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB1
	Battery installation date:				2014-08-12
	Battery levels:				Main: 11.34V Auxiliary: 13.75V
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15 AND ULB1
	New battery levels:			☐	Main: 11.34V Auxiliary: 13.75V
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	10.047	
2	10.541	
3	11.230	
4	13.095	
5	14.327	
6	15.797	
7	16.682	
8	17.427	

Bead	ohms	°C
9	18.035	
10	18.907	
11	19.609	
12	19.830	
13	2.174	
14	2.335	
15	2.259	
16	2.256	

SA MM

Datalogger Programming and Maintenance

Data collection frequency: 4.8 HRS
Data collection time: NOON
Maintenance requirements: NONE

CLAG=3.4 m

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name:	ELLIOTT HOLDEN	Inspection Date:	AUG. 16 2019
Inspector Signature:	EH	*Previous Inspection Date:	AUG 17 2014

Thermistor Information

*Site Name:	PIN-3	*Landfill:	TIER II DISPOSAL FAC.
*Thermistor #:	VT-5	Inclination:	☒ Vertical ☐ Inclined
12 *Northing:	7597408.9	*Easting:	409506.7
*Installation Date:	SEPT. 9 2004	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 REVISION 11-C	Datalogger Cable Model:	☐ USB ☒ Serial Port
Datalogger Serial #:	105066	Datalogger Cable Too Short?:	☐ Y ☒ N
*Elevation (masl):	~~7.82~~ 19.2	Extension Cable Required (m):	☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☐	☒	MISSING CAP FOR P1-15
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	CHECK BEAD 10 AND 16

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☐	☒		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☐	☒		BATTERY EXPIRY DATE Y19 M07
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:	COULD NOT CONNECT LOGGER TO COMPUTER			2014-8-17
	Battery levels:				Main: Auxiliary:
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☐		If yes, models:
	New battery levels:			☐	Main: Auxiliary:
	Was desiccant replaced?	☐	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 20__
	Was datalogger functional upon departure?	☐	☒		If no, brought south for repairs? ☒ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒ EH	☒

Manual Ground Temperature Readings

Bead	Kohms	°C
1	10.370	
2	10.414	
3	9.991	
4	12.017	
5	12.854	
6	14.305	
7	16.169	
8	18.512	

ERROR: DATALOGGER'S CLOCK HAS RESET. ~~ONLY~~ MEMORY ONLY 39% FULL

ERROR: BOTH BANKS OF THE MULTIPLEXER COULD NOT BE READ

Bead	Kohms	°C
9	19.199	
10	19.84	
11	20.71	
12	21.23	
13	21.98	
14	22.55	
15	23.58	
16	24.56	

Datalogger Programming and Maintenance

Data collection frequency: 48 Hrs

Data collection time: NOON

Maintenance requirements:

REPLACEMENT DATALOGGER: ~~12030012~~ 07110006 EH

DATE WHEN FULL 19/05/2024 ~~26/08/2024~~ EH

MAIN ~~11.34V~~ 11.34V EH AUX, ~~13.87V~~ 13.63 EH

CLAG = 4.2m

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name:	ELLIOTT HOLDEN	Inspection Date:	2019-08-16
Inspector Signature:		*Previous Inspection Date:	2014-08-17

Thermistor Information

*Site Name:	PIN-3	*Landfill:	TIER II DISPOSAL FAC
*Thermistor #:	VT-6	Inclination:	☒ Vertical ☐ Inclined
12 *Northing:	7597408.0	*Easting:	409546.7
*Installation Date:	2004-09-08	*Year 1 Monitoring Date:	2007-08-23
Datalogger Model #:	RX-16 REVISION H-C	Datalogger Cable Model:	☐ USB ☒ Serial Port
Datalogger Serial #:	111096	Datalogger Cable Too Short?:	☐ Y ☒ N
*Elevation (masl):	18.9	Extension Cable Required (m):	☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	CHECK BEAD 16

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

DATALOGGER TIME WAS OFF LOCAL: 6:57 . LOGGER 4:18

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB1
	Battery installation date:				2014-08-17
	Battery levels:				Main: 11.34 Auxiliary: 13.02
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15 AND ULB1
	New battery levels:			☐	Main: 11.34 Auxiliary: 13.14
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	10.592	
2	12.266	
3	9.904	
4	11.579	
5	12.937	
6	14.397	
7	16.395	
8	18.079	

Bead	ohms	°C
9	18.771	
10	19.535	
11	20.34	
12	21.18	
13	21.80	
14	22.54	
15	23.63	
16	24.40	

Datalogger Programming and Maintenance

Data collection frequency: 48 HRS
Data collection time: NOON
Maintenance requirements: NONE

CLAG 4.2M

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: ELLIOTT HOLDEN	Inspection Date: AUG. 16 2019
Inspector Signature: EH	*Previous Inspection Date: AUG. 17 2014

Thermistor Information

*Site Name: DIN-3	*Landfill: TIER II DISPOSAL FAC.
*Thermistor #: VT-7	Inclination: ☒ Vertical ☐ Inclined
212 *Northing: 7597351.7	*Easting: 409506.1
*Installation Date: 2003-09-10	*Year 1 Monitoring Date: 2007-08-23
Datalogger Model #: RX-16 REVISION H-C	Datalogger Cable Model: ☐ USB ☒ Serial Port
Datalogger Serial #: 111099	Datalogger Cable Too Short?: ☐ Y ☒ N
*Elevation (masl): 18.0	Extension Cable Required (m): ☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☐	☒	MISSING CAP FOR P2 - 15
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	CHECK BEAD 16

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☐	☒		STATUS LIGHT WAS DARK
	Battery models:				BATTERY EXPIRY DATE Y19 M07 Main: ULB-15 Auxiliary: ULB-11
	Battery installation date:				2014-08-17
	Battery levels:	COULD NOT CONNECT LOGGER TO COMPUTER			Main: Auxiliary:
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☐		If yes, models:
	New battery levels:			☐	Main: Auxiliary:
	Was desiccant replaced?	☐	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 20__
	Was datalogger functional upon departure?	☐	☒		If no, brought south for repairs? ☒ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☐	☒

Manual Ground Temperature Readings

Bead	K ohms	°C
1	9.521	
2	10.711	
3	12.749	
4	14.175	
5	15.940	
6	17.313	
7	17.993	
8	18.641	

ERROR OCCURED WHEN TRYING TO OBTAIN SENSOR READINGS, BOTH BANKS OF THE MULTIPLEXER COULD NOT BE READ.

Bead	K ohms	°C
9	19.475	
10	20.24	
11	20.97	
12	21.65	
13	22.14	
14	22.52	
15	23.29	
16	23.40	

Datalogger Programming and Maintenance

REPLACEMENT DATALOGGER 07110055

Data collection frequency: 48 Hrs

Data collection time: NOON

Maintenance requirements:

DATE WHEN MEMORY IS FULL 26/08/2019

MAIN 11.34V AUX. 13.63V

CLAG = 4.2 m

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: ELLIOTT HOLDEN	Inspection Date: 2019 - 8 - 16
Inspector Signature:	*Previous Inspection Date: 2014 - 8 - 17

Thermistor Information

*Site Name: PIN-3	*Landfill: TIER II DISPOSAL FAC.
*Thermistor #: VT-B	Inclination: ☒ Vertical ☐ Inclined
2 12 *Northing: 7597350.9	*Easting: 409545.8
*Installation Date: 2003-09-09	*Year 1 Monitoring Date: 2007 - 08 - 23
Datalogger Model #: RX-16 REVISION H-C	Datalogger Cable Model: ☐ USB ☒ Serial Port
Datalogger Serial #: 111091	Datalogger Cable Too Short?: ☐ Y ☒ N
*Elevation (masl): 17.9	Extension Cable Required (m): ☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	CHECK BEAD 16

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

LOGGERS TIME WAS OFF

		Yes	No	N/A	Details
Batteries Found in Datalogger	Was datalogger functional upon arrival?	☒	☐		LOCAL 7:47, LOGGER 5:15
	Battery models:				Main: ULB-15 Auxiliary: ULB 1
	Battery installation date:				2014-08-17
	Battery levels:				Main: 11.34 Auxiliary: 13.38
	Memory battery best before date:				JULY 2005 (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☒	☐		If yes, models: ULB-15 AND ULB 1
	New battery levels:			☐	Main: 11:34 Auxiliary: 13:38
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 06 2026
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	9.641	
2	11.017	
3	12.623	
4	13.921	
5	15.912	
6	17.423	
7	18.12	
8	18.78	

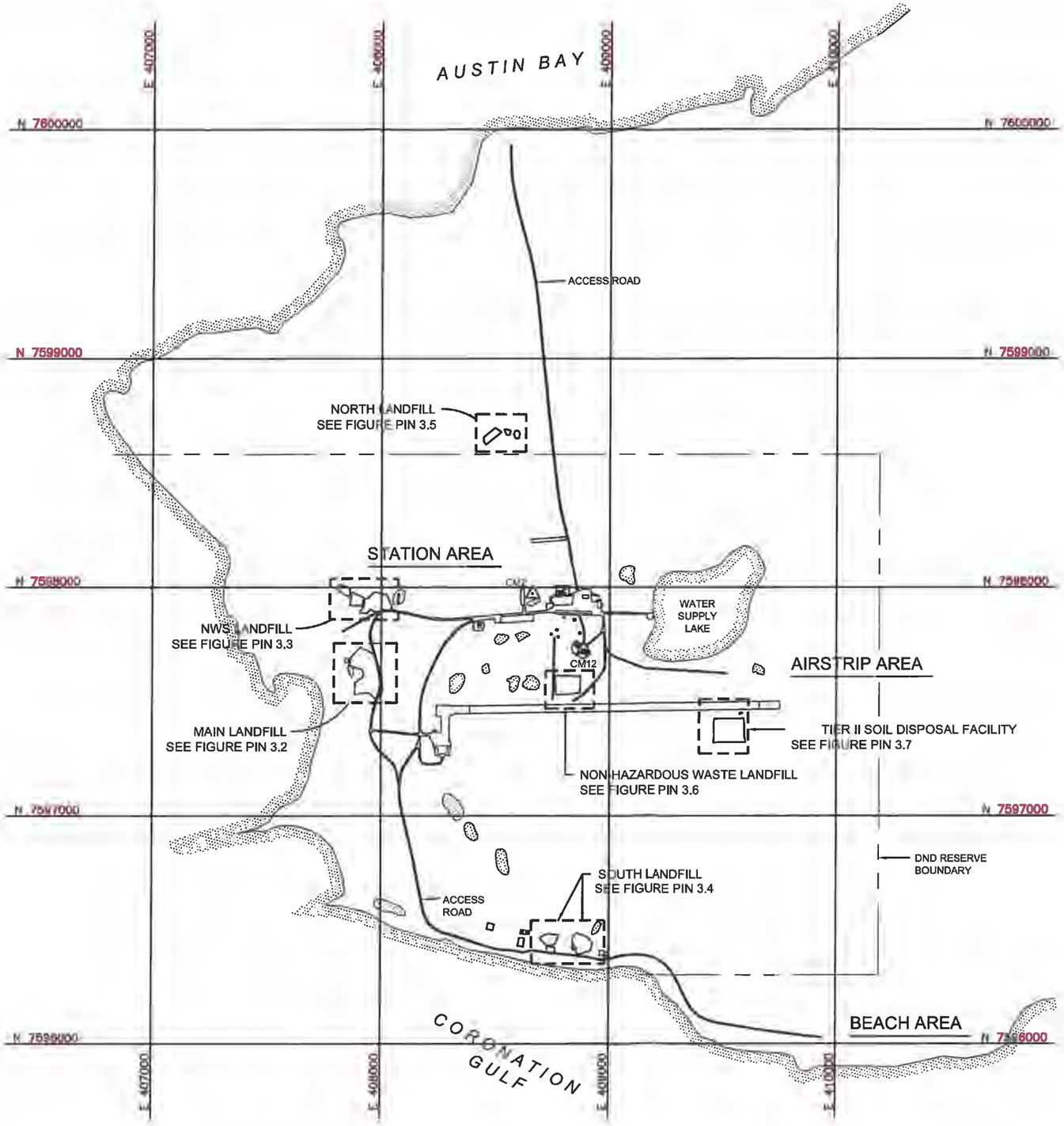
Bead	ohms	°C
9	19.61	
10	20.26	
11	21.01	
12	21.80	
13	22.31	
14	22.59	
15	22.86	
16	23.70	

Datalogger Programming and Maintenance

Data collection frequency: 48 HRS
Data collection time: NOON
Maintenance requirements: NONE

CLAG = 4.2m

*Pre-populate this information before field program using previous reports



LEGEND

CM2 SURVEY CONTROL MONUMENT

WATERBODY

0 200m 400m 600m 800m 1000m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	15-04-23	P.L	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
PIN-3, LADY FRANKLIN POINT (NUNAVUT)
OVERALL SITE PLAN

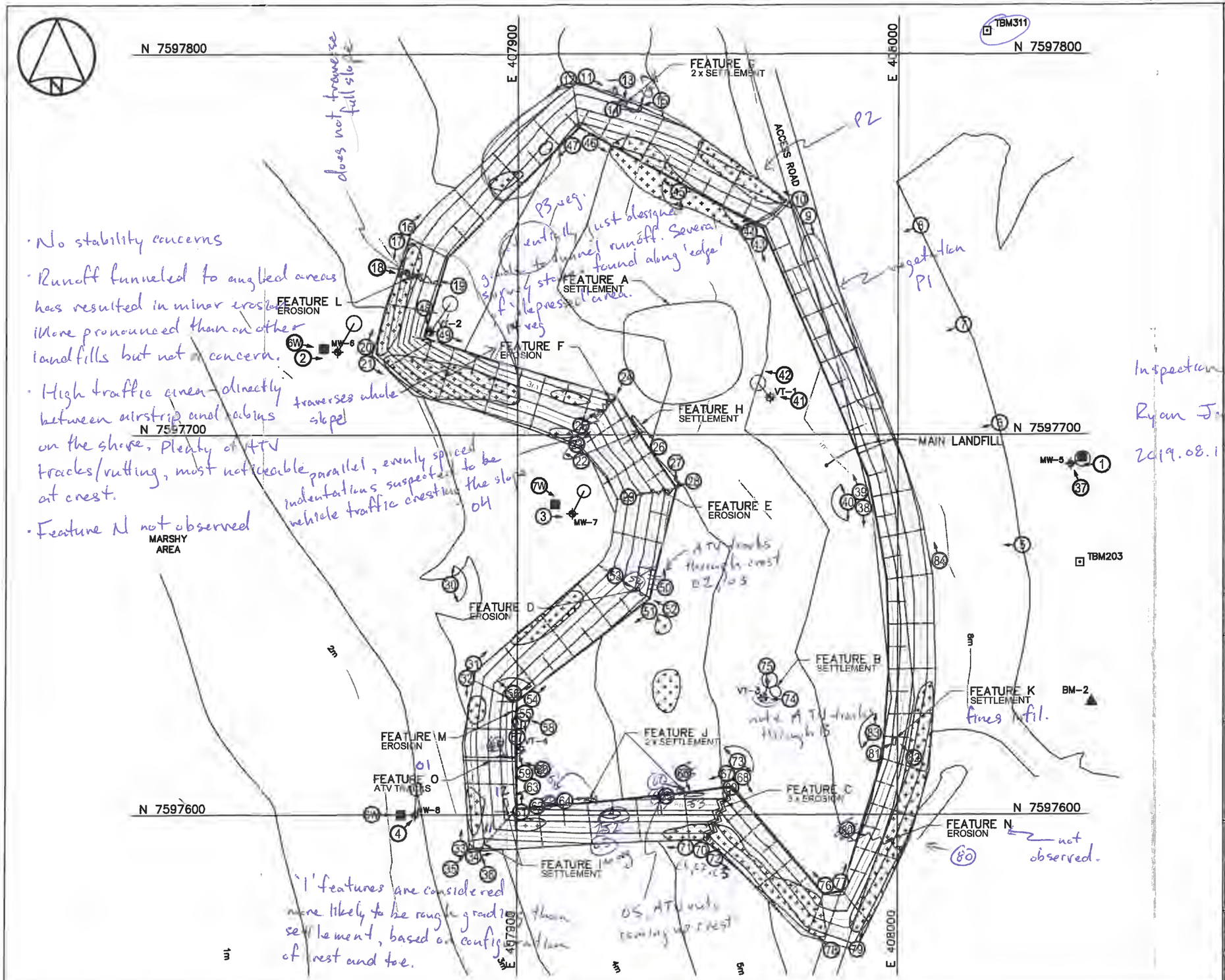
SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 20,000	APRIL 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS P. Eng.
PROJECT NO: CD2656_400_403	DRAWING NO: CD2656_400_403_101-PIN-3_A	PAGE LS

FIGURE PIN-3.1

G:\CD2656\PIN-3\2014\FINAL\CD2656_400_403-PIN-3_A.dwg, LS, 2015-04-23 9:53:59 AM



- No stability concerns
- Runoff funneled to angled areas has resulted in minor erosion illone pronounced than on other landfills but not a concern.
- High traffic area directly between airstrip and cabins on the shore. Plenty of ATV tracks/rutting, most noticeable at crest.
- Feature N not observed

P3 veg. gentle to moderate slope, currently stable, just designed to funnel runoff. Several small depressions found along 'edge' of veg

'1' features are considered more likely to be rough grading than settlement, based on configuration of crest and toe.

Inspection completed by
Ryan Janzen
2019.08.17

LEGEND

- TBM203 — TEMPORARY BENCHMARK
- BM-2 — PERMANENT BENCHMARK
- MW-5 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SAMPLE LOCATION
- SETTLEMENT (NTS)
- EROSION (NTS)
- ATV TRACKS (NTS)
- SPARSE VEGETATION
- APPROX. PHOTOGRAPHIC VIEWPOINT

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	15-04-23	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
PIN-3, LADY FRANKLIN POINT (NUNAVUT)
EXISTING MAIN LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 1,000	APRIL 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS P. Eng.
PROJECT NO: CD2656_400_403	DRAWING NO: CD2656_400_403_101-PIN-3_B	PAGE PL

FIGURE PIN-3.2

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIM-3 Lady Franklin Point
LANDFILL DESIGNATION: Existing Main Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): existing containment landfill
DATE OF INSPECTION: 2019.08.17
WEATHER CONDITIONS: mixed sun and cloud, breezy, cool.
DATE OF PREVIOUS INSPECTION: 2014.08.19
INSPECTED BY (name and signature): Ryan Janzen
REPORT PREPARED BY (name and signature): Ryan Janzen
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; It should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) See Trimble data Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	A = acceptable M = marginal Description (include stability rating for each feature) S = significant U = unacceptable	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A	cap surface, NW of VT-1.		844.7 m²	N/A		~2%	Large, subtle, 'depression'. A.	No change	Potentially designed this way; grades runoff to natural point.	MLF_42
		B	cap surface, adjacent VT-3, NE		2.5	2	0.15	<1%	Subtle depression. A.	No change, measured slightly smaller than prev.		MLF_75
~~Erosion~~ Settlement		G1	northernmost point, at the toe of slope.		4.5	1	0.10	<1	minor depression. A	consistent	small, point depression.	MLF_13
		G2			1.2	0.5	0.05	<1	minor depression. A	consistent	L-shaped depressed area.	MLF_14,15
		H										
~~Lateral Movement~~ Settlement		I1	SW most point, at the toe.		4	4	0.15	<1	Depression. A	Consistent.	Considered likely to be due to grading inconsistencies.	MLF_35,36
		I2	SW most point, at the crest.		2	0.5	0.1	<1	minor depression. A	consistent.		MLF_37
		J1	along S crest.		2	1	0.05	<1	minor depression. A	larger than prev. noted.		MLF_64
		J2			5.5	2.2	0.10	<1	minor depression. A	NEW OBS		MLF_65
~~Frost Action~~ Settlement		K	east slope just below crest.		2	0.5	0.1	<1	Subtle depression. A	larger than prev. noted	Appears to be fines infiltration.	MLF_82,83
		J3	along S. crest.		4.5	1.6	0.1	<1	minor depression. A	larger than prev. noted.		MLF_66
~~Sloughing~~ Erosion		C1	S side elbow, from crest to toe.		13	0.15	0.1	<1	minor erosion at runoff funnel point. A	consistent		MLF_~~69~~ ~~70~~ 70, 71
		C2	"		13	0.2	0.1	<1				
		C3	"		12.5	0.15	0.1	<1				
~~Cracking~~ Erosion		D	S most elbow on W side, at crest.		7	0.3	0.15	<1	minor erosion. A	longer than prev. noted	Erosion at runoff funnel point.	MLF_52,53
		E	Elbow on W side, crest to toe		19.5	0.3	0.05	<1	minor erosion. A	longer than prev. noted	Erosion at runoff funnel point.	MLF_28,29
~~Animal Burrows~~ Erosion		F	Elbow on W side, crest to toe.		20	0.2	0.1	<1	minor erosion. A	longer than prev. noted	Erosion at funnel point.	MLF_23,24,25
		L	NW slope, midpoint to toe.		5.5	0.2	0.05	<1	minor erosion. A	smaller than prev. noted		MLF_18,19

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment / Erosion		M	W side slope, towards the S. Crest to midpoint.		9.75	0.1	0.05	<1	minor erosion. A	Significantly longer than prev. noted.		MLF_58, 59
		N	not observed.		NA	NA	NA	NA	Feature not observed. Area photo taken at prev. noted location.			MLF_81 (area photo).
Staining / Vegetation	Y	P	Across entire structure, more prevalent on slopes.		total ~3100 m²	NA		~9%	Sparse vegetation. A	Greater coverage than previously noted.		MLF_79, 6, 7, 8, 10, 11, 12 20, 21, 24, 30, 51, 54, 32 70
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	Y	NA	NA		NA	NA	NA	<1	VT-1 through-4 MW-5 through-8	consistent	all in working order, no obvious damage.	MLF_1 through_4, 41, 48 60, 75, 76
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	01	SW crest.		3.5	0.1	0	<1	ATV ruts from vehicles cresting the slope. A. (through feature H).	greater in number than previously noted.	LF is directly between Ranger camp and airstrip, and is the fastest route for traffic. Also good observation point.	MLF_61
		02	Elbow on W side, at crest.		6	0.15	0.05	<1				MLF_55
		03	"		5	0.15	0.15	<1				
		04	Elbow on W side, at crest.		1	0.15	0.05	<1				MLF_26
		05	S crest.		3	0.15	0.05	<1				MLF_67

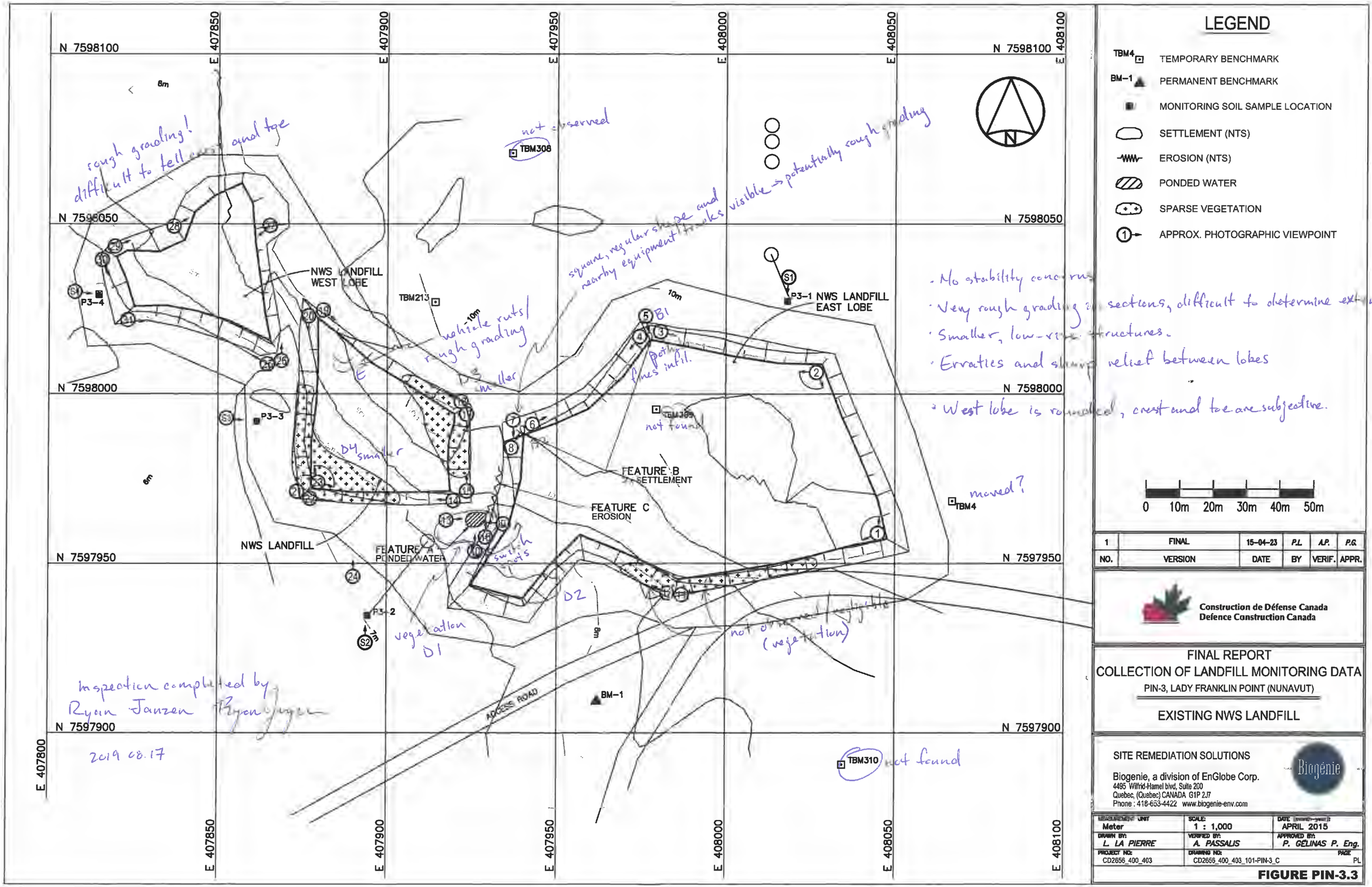


FIGURE PIN-3.3

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: NWS Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): Regraded
DATE OF INSPECTION: 2019.08.17
WEATHER CONDITIONS: Overcast, breezy, cool
DATE OF PREVIOUS INSPECTION: 2014.08.17
INSPECTED BY (name and signature): Ryan Janzen
REPORT PREPARED BY (name and signature): Ryan Janzen
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

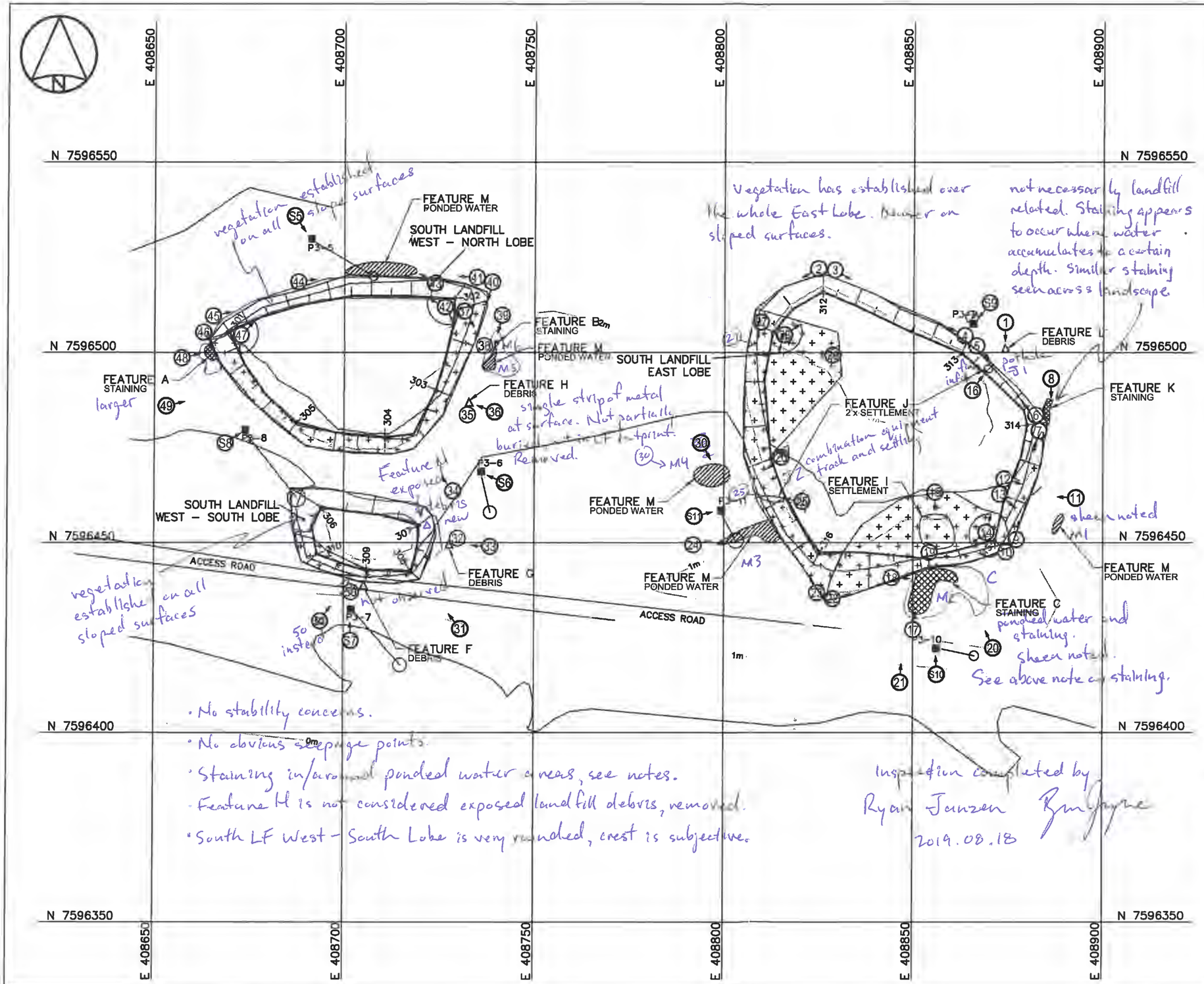
- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
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- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	A = acceptable M = marginal Description (include stability rating for each feature) S = significant U = unacceptable	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	B1	NW point, at crest	See Trimble data	0.75	0.5	0.15	<1	minor depression. A	consistent	Fines infiltration.	NWS_5
		B2	W point, at crest.		2	1.3	0.15	<1	minor depression. A	wider than prev. noted.	Potentially vehicle track (shape).	NWS_8
Erosion	Y	C	between E and central lobes.		7.2	0.3	0.05	<1	minor erosion trench. A	smaller than prev. noted.	Erosion trench leading to ponded water. Not technically on landfill.	NWS_16
Lateral Movement	N											
Frost Action	N											
Sloughing	N											
Cracking	N											
Animal Burrows	N											

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	D1	around ponded water		78.5m²	NA		~2%	sparse vegetation. A.	larger and more numerous than previously noted.		NWS ~~MLF~~ _10, 13
		D2	E lobe, SW quadrant.		195m²	NA		<1%				NWS ~~MLF~~ _12
~~Staining~~ Vegetation		D3	central lobe, NE corner.		42m²	NA		<1%				NWS ~~MLF~~ _17, 18
		D4	central lobe, SW corner.		505m²	NA		~4%				NWS _22, 23
Vegetation Stress	N											
~~Standard Points for~~ Ponded Water	Y	A	between E and central lobes		9m²	0.3		<1	small pond, appears permanent. A	consistent		NWS_9, 10, 13
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	N											
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	E	central lobe, NW corner.		7	0.4	0.2	<1	~~vehicle~~ equipment tracks, Construction relic. A	NEW OBS.	particularly rough grading.	NWS_21



- No stability concerns.
- No obvious seepage points.
- Staining in/around ponded water areas, see notes.
- Feature M is not considered exposed landfill debris, removed.
- South LF West – South Lobe is very rounded, crest is subjective.

Inspection completed by
Ryan Janzen
2019.08.18

LEGEND

- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- SETTLEMENT (NTS)
- EROSION (NTS)
- PONDED WATER
- STAINING
- DEBRIS
- SPARSE VEGETATION
- APPROX. PHOTOGRAPHIC VIEWPOINT

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	15-04-23	P.L	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

EXISTING SOUTH LANDFILL

SITE REMEDIATION SOLUTIONS
Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com

MEASUREMENT UNIT: Meter	SCALE: 1 : 1,000	DATE (month-year): APRIL 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS P. Eng.
PROJECT NO: CD2656_400_403	DRAWING NO: CD2656_400_403_101-PIN-3_D	PAGE PL

FIGURE PIN-3.4

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIM-3 Lady Franklin Point
LANDFILL DESIGNATION: South Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): regraded
DATE OF INSPECTION: 2019.08.18
WEATHER CONDITIONS: Mixed sun and cloud, breezy
DATE OF PREVIOUS INSPECTION: 2014.08.18
INSPECTED BY (name and signature): Ryan Janzen
REPORT PREPARED BY (name and signature): Ryan Janzen
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
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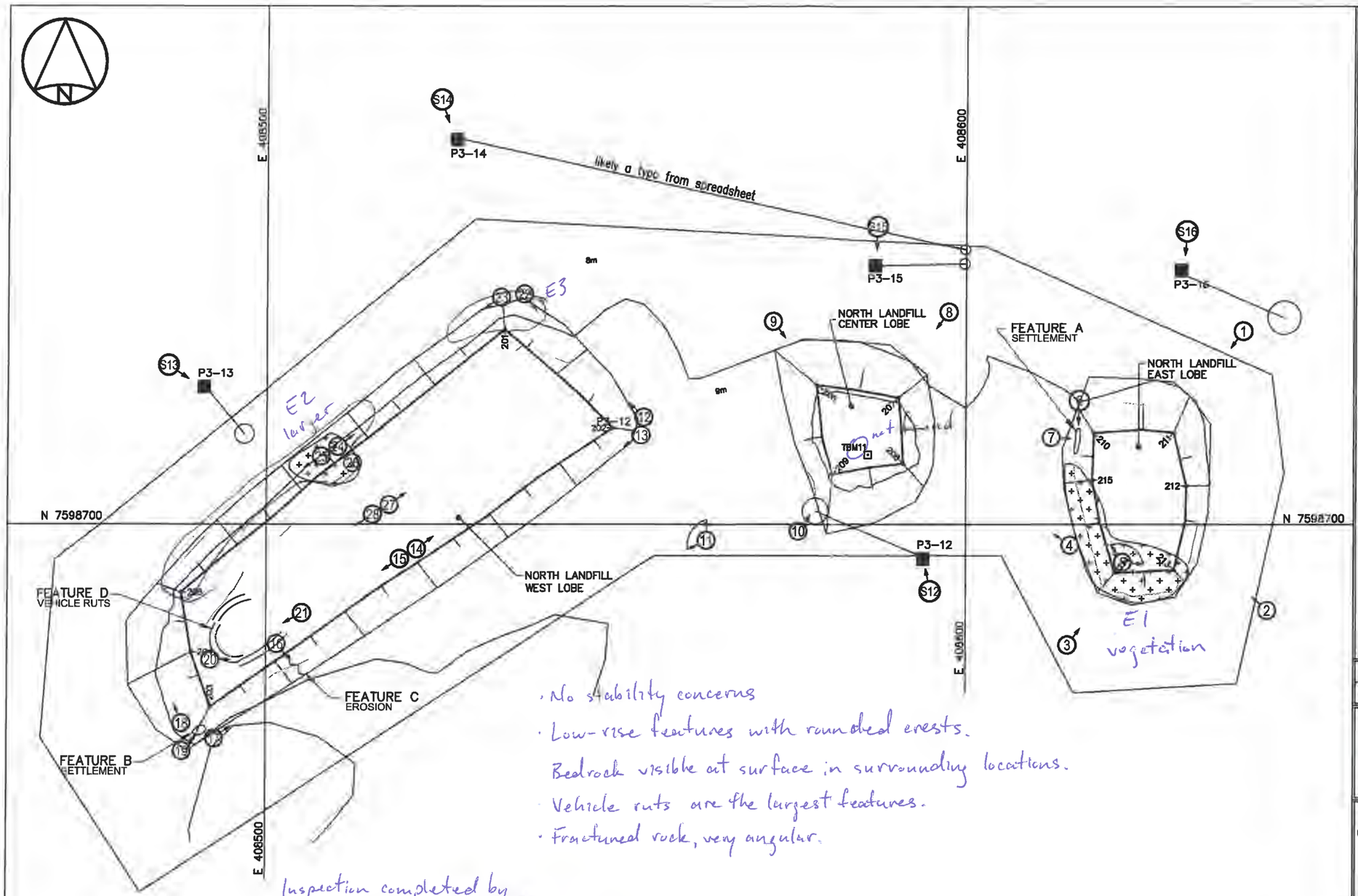
VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

A = acceptable
M = marginal
U = unacceptable

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) See Trimble data Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature) S = significant	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement		1	Cap of E lobe, southern end.		5	m^2	0.3	<1	Subtle depressed area. A	consistent.	Potentially purposefully graded, funnels runoff to pond.	SLF_15
	Y	J1	NE slope of E lobe		0.3	0.3	0.2	<1	minor depression. A	consistent.		SLF_16
		J2	SW slope of E lobe.		5	0.9	0.1	<1	minor depression. A	larger than prev. noted		SLF_25
Erosion	N											
Lateral Movement Ponded Water	Y	M1	E of E lobe		5.5	m^2	0.1	NA	Ponded water. A Landfills are not high enough/steep sided enough for current extent of water at toe to warrant a stability concern.	consistent.	Surrounding area is low, marshy shoreline. Ponded water present	
		M2	S of E lobe		25	m^2	0.2	NA		consistent.		
		M3	W of E lobe		46.5	m^2	0.3	NA		consistent.		
Frost Action Ponded Water		M4	W of E lobe		27	m^2	0.3	NA		consistent.	all access immediate landscape.	
		M5	E of NW lobe		4.5	m^2	0.05	NA		consistent.		
		M6	E of NW lobe.		12.5	m^2	0.05	NA		consistent		
Slumping Ponded Water		M7	N of NW lobe.		140	m^2	0.5	NA		consistent.		
Cracking	N											
Animal Burrows	N											

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	01	Entire E lobe.				0	~50%	Sparse vegetation. A	Larger than previous figures		SLF_11
		02	Sloped surface of NW lobe.				0	~5%				SLF_49
		03	Sloped surface of SW lobe				0	~2%				SLF_31
Staining	Y	A	W of NW lobe.			43 m²		<1	Staining, orange. A	slightly larger than prev. figures.	similar staining seen in areas beyond landfill immediate location as well.	SLF_46, 48
		B	E of NW lobe.			70 m²		<1	Staining, orange. A	slightly larger than prev figures.		SLF_38
~~Vegetation Stress~~ Staining		C	S of E lobe.			104 m²	NA	<1	Staining, orange. A	slightly larger than prev. figures		SLF_10, 17-21
		K	E of G lobe.			178 m²		~1%	Staining, orange. A	significantly larger than prev. figures.		SLF_6-8
~~Seepage Points~~ (or) Ponded Water	Y	D	no specific seepage points observed. specific locations not noted on previous report					NA	Not observed.	NA.	No seepage seen at any specific point/area during time of inspection. No staining on actual constructed landfill.	none.
		E						NA figures.				
Debris and/or Liner Exposed	Y	F	not observed - potentially removed.					NA	Not observed.	NA.	On roadway - removed?	SLF_50 shows area.
		G	E of SW lobe Not on landfill		0.05	0.05	—	<1	Small piece of metal. A	consistent.	Not on landfill footprint.	SLF_32
Presence & ~~Condition~~ of ~~Monitoring~~ Instruments Debris		H	E of NW lobe. Surface debris		0.3	0.05	0	<1	Surface debris. A.	consistent.	removed.	SLF_35, 36
		L	NE of E lobe.		6.4	0.2	—	<1	Partially buried drum. A	consistent.		SLF_1
		N	E side of SW lobe.		0.15	0.05	—	<1	Partially buried metal. A	NEW OBS.		SLF_50
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)												



- No stability concerns
- Low-rise features with rounded crests.
  Bedrock visible at surface in surrounding locations.
- Vehicle ruts are the largest features.
- Fractured rock, very angular.

Inspection completed by
Ryan Janzen
2019 08.19

LEGEND

- TBM11 — TEMPORARY BENCHMARK
- 201 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- SETTLEMENT (NTS)
- EROSION (NTS)
- VEHICLE RUTS
- SPARSE VEGETATION
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

0 6m 12m 18m 24m 30m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	15-04-23	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
PIN-3, LADY FRANKLIN POINT (NUNAVUT)
EXISTING NORTH LANDFILL

SITE REMEDIATION SOLUTIONS
Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com

MEASUREMENT UNIT	SCALE:	DATE (Year-Month):
Meter	1 : 600	APRIL 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS P. Eng.
PROJECT NO: CD2656_400_403	DRAWING NO: CD2656_400_403_101-PIN-3_E	PAGE PL

FIGURE PIN-3.5

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: North Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH). regraded.
DATE OF INSPECTION: 2019.08.18
WEATHER CONDITIONS: Overcast, breezy. Intermittent rain
DATE OF PREVIOUS INSPECTION: 2014.08.18
INSPECTED BY (name and signature): Ryan Janzen
REPORT PREPARED BY (name and signature): Ryan Janzen
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

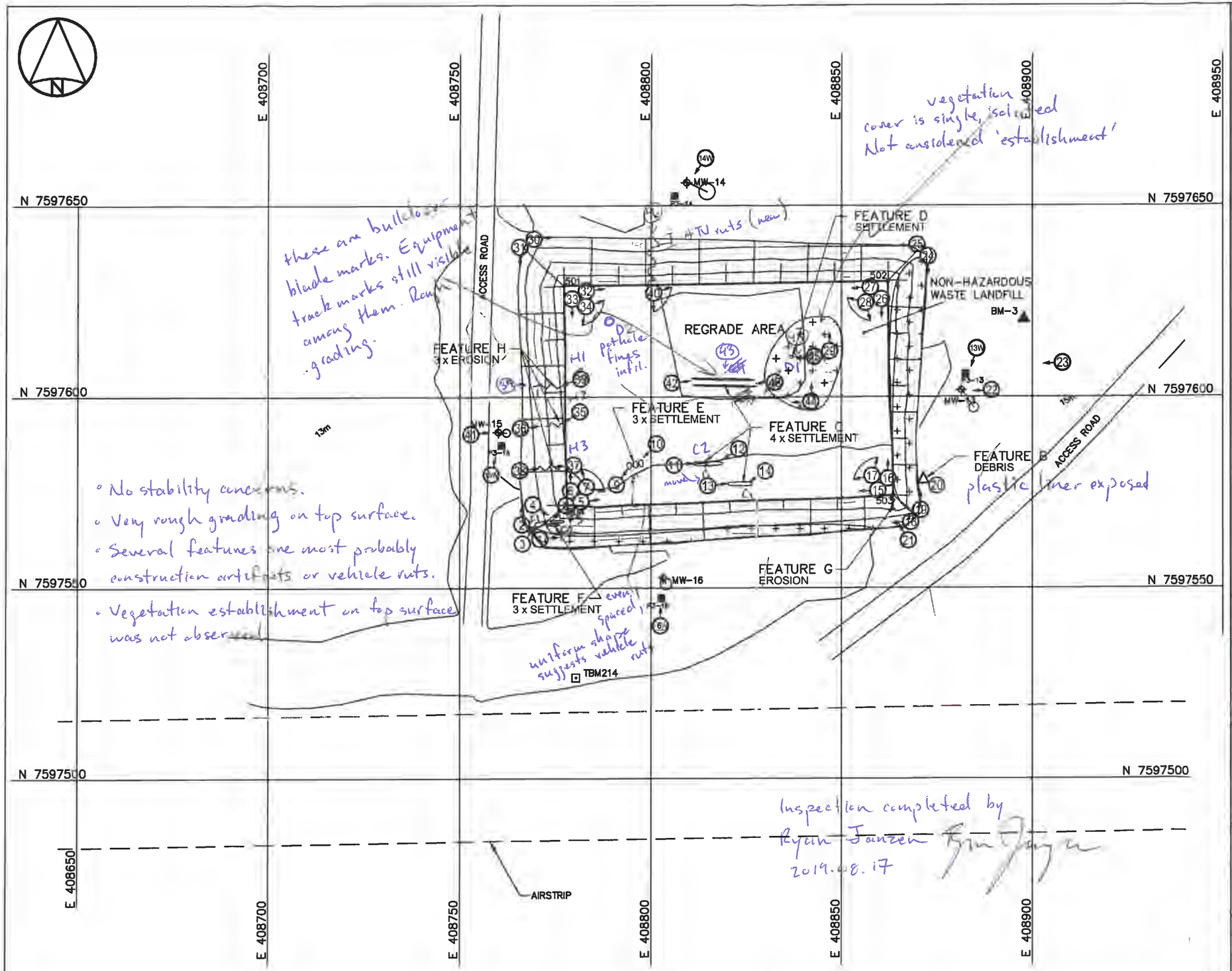
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VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	A = acceptable M = marginal Description (include stability rating for each feature) S = significant U = unacceptable	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A	NW slope of E lobe.	See Trimble data	5.8	0.2	0.1	<1	minor linear depression. A	longer than prev. noted.		NLF_6, 7
		B	SW corner of W lobe.		0.7	0.6	0.15	<1	minor depression. A	consistent.		NLF_18, 19
Erosion	Y	C	S slope of W lobe, to the west.		4.5	0.1	0.05	<1	minor erosion. A	longer than prev noted.		NLF_16
Lateral Movement	N											
Frost Action	N											
Sloughing	N											
Cracking	N											
Animal Burrows	N											

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	E1	SW corner of E lobe		92	5m²	NA	~2%	Sparse vegetation. A	larger than prev. figures		NLF_3
		E2	NW slope of W lobe.		105 m²		NA	~2%				NLF_26
Staining Vegetation		E3	N point of W lobe.		134m²		NA	<10				NLF_22,23
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	N											
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	D	SW quadrant of W lobe.		19.5m²		NA	<1	Equipment tracks.	consistent. Slightly different shape than previous figures.	rough grading	



- No stability concerns.
- Very rough grading on top surface.
- Several features are most probably construction artifacts or vehicle ruts.
- Vegetation establishment on top surface was not observed.

Inspection completed by
Ryan Jantzen
2019.08.17

LEGEND

- TBM214 — TEMPORARY BENCHMARK
- BM–3 — PERMANENT BENCHMARK
- MW–13 — MONITORING WELL LOCATION
- 501 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- SETTLEMENT (NTS)
- EROSION (NTS)
- DEBRIS
- SPARSE VEGETATION
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	15-04-23	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

NON HAZARDOUS WASTE LANDFILL

SITE REMEDIATION SOLUTIONS
Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com

Meter	1 : 1,000	APRIL 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS P. Eng.
CD2656_400_403	CD2656_400_403_101-PIN-3_F	PL

FIGURE PIN-3.6

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIM-3 Lady Franklin Point
LANDFILL DESIGNATION: Non-Hazardous Waste Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): non-hazardous
DATE OF INSPECTION: 2019.08.17
WEATHER CONDITIONS: Overcast, breezy
DATE OF PREVIOUS INSPECTION: 2014.08.18
INSPECTED BY (name and signature): Ryan Janzen
REPORT PREPARED BY (name and signature): Ryan Janzen
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; It should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

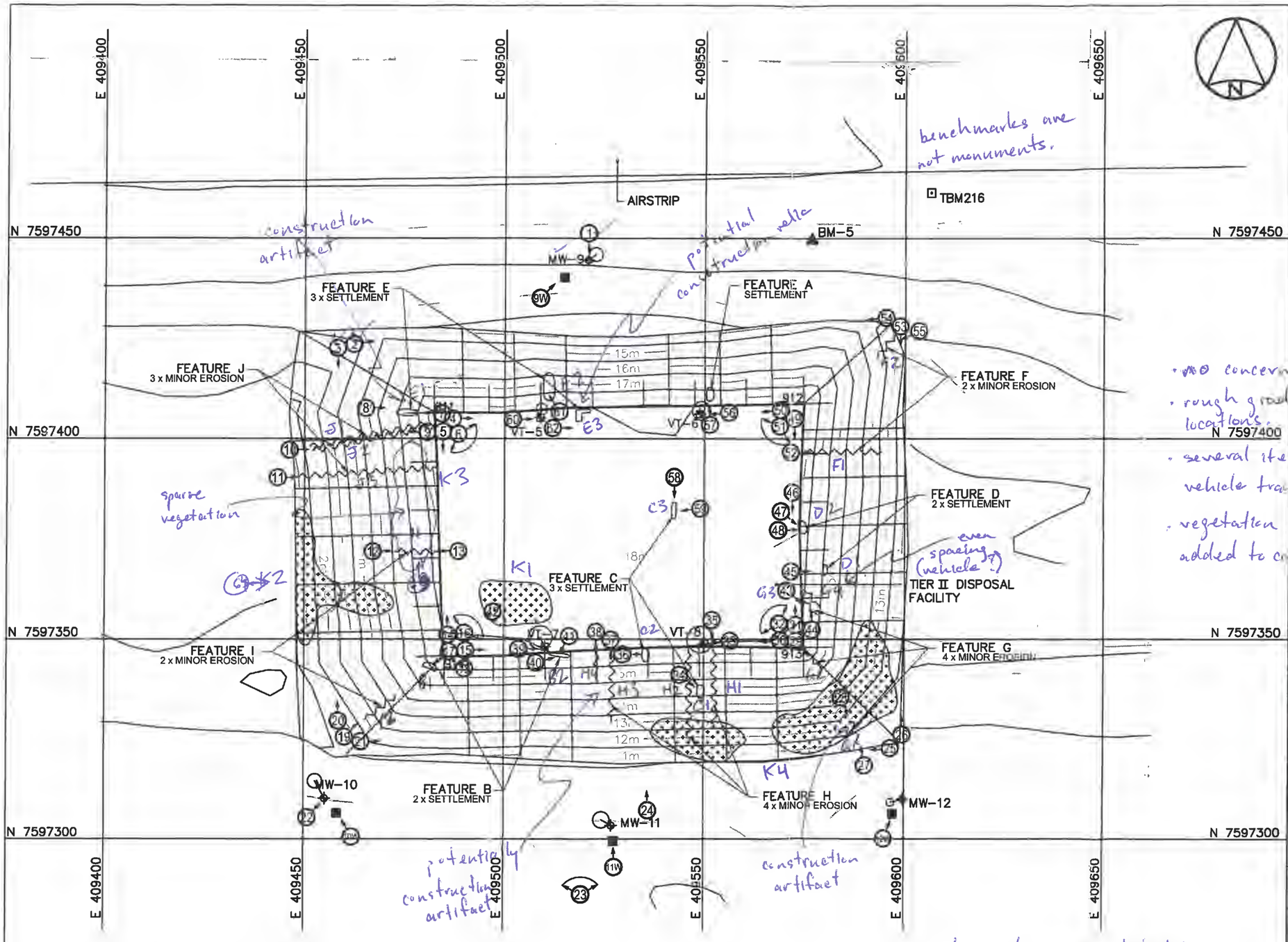
VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

A = acceptable
M = marginal
S = significant
U = unacceptable

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement		A	Not observed.	See Trimble data	NA	NA	NA	NA	Not observed in 2014.	consistent.		none
	Y	C1	cap of LF, towards S side.		5.4	0.1	0.05	<1	consistent	linear depression. A		NHLF_13,14
		C2							consistent	linear depression. A		NHLF_11,12
~~Erosion~~ Settlement		C3	middle of LF cap. Not considered independent features (rough grading area)					<1	consistent	part of rough graded A area. Bulldozer blade marks. of the 'regraded area' prev noted.	Not considered independent	NHLF_42
		C4						<1	consistent			
		D1	Central cap, inside single corner.		1.2	1	0.1	<1	larger than prev noted.	minor depression. A		NHLF_45
~~Lateral Movement~~ Settlement		D2	Top of cap, up at NW corner		1.5	0.7	0.1	<1	larger than prev. noted.	NEW OBS fines infil. A	Fines infiltration.	NHLF_34
		E	Top of cap, towards SW corner		4.3	2.4	0.1	<1	minor depressions - equipment tracks	combined-same feature. A	Regular shape and dimensions	NHLF_9,10
		F1	SW corner on slope.		3	0.15	0.05	<1	minor linear depression. A	longer than prev. noted.		NHLF_3,4,8
~~Frost Action~~ Settlement		F2	SW corner on slope.		4.7	0.25	0.05	<1	minor linear depression. A	longer than prev. noted.		NHLF_3,4,8
		F3	SW corner on slope.		4.7	0.25	0.05	<1	minor linear depression. A	longer than prev. noted.		NHLF_3,4,8
~~Sloughing~~ Erosion	Y	G	SE corner on slope.		10	0.2	0.05	<1	S-shaped erosion. A	consistent (longer due to slope).		NHLF_21
		H1	W slope, from crest progressing towards toe. Doesn't traverse full slope.		3.6	0.05	0.05	<1	minor linear erosion. A	consistent.		NHLF_39
		H2			5.9	0.1	0.05	<1	minor linear erosion. A	consistent.		NHLF_35,36
~~Cracking~~ Erosion		H3			7.5	0.1	0.05	<1	minor linear erosion. A	consistent.		NHLF_37,38
Animal Burrows	N											

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	11	S slope at LF.		44 m^2		NA	~4%	Sparse vegetation A	consistent.		NHLF_4,18
		12	E slope.		22 m^2		NA	~2%		consistent.		NHLF_19,24
		13	N slope		71 m^2		NA	~8%		NEW OBS.	Not previously noted.	NHLF_25,30
Staining	N											
Vegetation Stress	N											
Seepage Points (or) Ponded Water	N											
Debris and/or Liner Exposed	Y	B	S E corner at toe of landfill.		0.4	0.4	NA	<1	Plastic liner exposed.	consistent.	Black HDPE liner. Not geotextile as previously noted	NHLF_20
Presence & Condition of Monitoring Instruments	Y	NA	NA		NA	NA	NA	NA	MW-13 to -16	consistent.	No obvious damage.	NHLF_22,41
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	J	N slope, from crest to toe.		16	0.15	0.05	<1	ATV tracks up slope.	NEW OBS		NHLF_46
		K	Top of landfill cap, N part		900 m^2	0		~10%	Very roughly graded area.	consistent.	Blade and tread marks throughout this area. Features previously noted as part of the C series are included in here.	NHLF_40,42,44



LEGEND

- TBM216 — TEMPORARY BENCHMARK
- BM-5 — PERMANENT BENCHMARK
- MW-12 — MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- 911 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- SETTLEMENT (NTS)
- EROSION (NTS)
- SPARSE VEGETATION
- APPROX. PHOTOGRAPHIC VIEWPOINT

benchmarks are not monuments.

- no concerning features
- rough grading, especially along crest in several locations.
- several items listed as 'erosion' are potentially vehicle tracks/construction artifacts.
- vegetation appears to have spread, two photos added to capture this. Designated 'K' features.

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
1	FINAL	15-04-23	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
PIN-3, LADY FRANKLIN POINT (NUNAVUT)

TIER II DISPOSAL FACILITY

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com

MEASUREMENT UNIT	SCALE	DATE (month-year)
Meter	1 : 1,000	APRIL 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS P. Eng.
PROJECT NO: CD2656_400_403	DRAWING NO: CD2656_400_403_101-PIN-3_G	PAGE PL

FIGURE PIN-3.7

Inspection completed by
Ryan Janzen
2019.08.16

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIN-3 Lady Franklin Point
LANDFILL DESIGNATION: Tier II
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): Tier II
DATE OF INSPECTION: 2019.08.16
WEATHER CONDITIONS: Overcast, breezy, scattered showers
DATE OF PREVIOUS INSPECTION: 2014.08.14
INSPECTED BY (name and signature): Ryan Janzen, P.Eng.
REPORT PREPARED BY (name and signature): Ryan Janzen, P.Eng.
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; It should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

A = acceptable
M = marginal
S = significant
U = unacceptable

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement		A	N slope, close to VT-6. see Trimble		3	1.5	0.15	<1%	Slight depression. Acceptable.	Marginal increase. Consistent	Not a stability concern.	T11_57
	Y	B1	SW crest		4	1.3	0.10	<1%	linear depression. Acceptable.	consistent.		T11_17,18
		B2	S central crest.		5	1	0.15	<1%	linear depression. Acceptable.	larger than prev. noted	Abutting VT-7.	T11_40,41
~~Erosion~~ Settlement		C1	S slope, mid slope. Down from VT-8		2	1.2	0.10	<1%	Slight depression. A	consistent.	All 'C' features are potentially construction artifacts.	T11_34
		C2	S slope crest, midway.		1.5	1	0.1	<1%	"	consistent.		T11_36
		C3	Top surface, roughly central			~~1~~ m²	0.1	<1%	"	larger than prev. noted.		T11_58,59
~~Lateral Movement~~ Settlement		D1	E slope, near SE corner. 3/4 way up		2.6	1.4	0.1	<1%	Pothole depression (fines infiltration). A	larger than prev. noted.	E crest is roughly graveled and is softer (foot traffic is enough to deform). No overall stability concerns	T11_45
		D2	E slope crest, mid point		1.7	0.9	0.1	<1%	Combination of rough grading and settlement (fines infil.). A.	larger than prev. noted.		T11_46-48
~~Frost Action~~ Settlement		E1	NW corner, close to crest.		4	0.3	0.15	<1%	Linear depression. A.	consistent	Combination of infil./erosion.	T11_7
		E2	N slope, mid slope near VT-5.			10 m²	0.15	<1%	Depressed area. A.	consistent	Sizable area but not deep	T11_61
		E3	Top surface near crest, near VT-5			7 m²	0.1	<1%	slight depression. Vehicle A.	consistent	Shape indicates equipment tracks (construction relic).	T11_62
~~Sloughing~~ ~~Settlement~~ Erosion	Y	F1	NE corner, E slope Crest down		17	0.3	0.1	<1%	Minor linear erosion. A.	consistent		T11_52
		F2	NE corner, toe of slope up.		8.2	0.1	0.15	<1%	Minor linear erosion. A.	consistent		T11_55
~~Cracking~~ Erosion		G1	SE corner, base to mid slope.		17	1	0.15	<1%	Combo of erosion/track marks. A.	Longer than prev noted.	Construction relic, potentially. Actually erosion. E crest is soft, suspect G3, G4 are the result of vehicle.	T11_27,28
		G2	SE corner crest to mid slope.		8	0.1	0.05	<1%	Minor erosion. A			T11_29
		G3	Crest on E slope, close to corner.		9	0.4	0.1	<1%	Minor linear features, minimal			T11_44
		G4	"		7.5	0.2	0.05	<1%	extent, A			T11_43
~~Animal Burrows~~ Erosion		H1	S slope, top to bottom. Near VT-8.		19.5	0.2	0.1	<1%	Minor erosion. A.	Longer than previously noted	No stability concerns.	T11_35
		H2			14	0.2	0.05	<1%	"			
		H3	S slope, middle. Crest to mid slope.		22	0.3	0.15	<1%	"			T11_37
		H4			11	0.1	0.05	<1%	"			T11_38

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) See Trimble. Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description (include stability rating for each feature)	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment / Erosion	Y	I1	W slope middle. Crest to midslope		8	0.3	0.25	<1%	Minor linear erosion. A.	longer than prev. noted.	No stability concerns.	T11_12,13
		I2	SW corner, midslope.		11	0.2	0.05	<1%	"	longer than prev. noted.		T11_19
Staining / Erosion		J1	NW corner, W slope. Crest to toe.		16	0.2	0.05	<1%	Minor linear erosion. A	consistent	No stability concerns.	T11_9,10
		J2			18	0.3	0.1	<1%	"	consistent		T11_9,10
		J3	W slope, close to NW corner. Crest to toe.		20	0.2	0.1	<1%	"	consistent		T11_11
Vegetation Stress / Established	Y	K2	W slope, base and midslope.		2090m²	NA		~6%	Sparse vegetation, denser at toe of slope. A	Larger than previously noted.	Potentially providing some stability at toe.	T11_42,64
		K3	W slope, midslope, up to crest.		270m²	NA		<1	Sparse - more like a collection of several spots of concentration	A New observation.	No overall effect on stability likely.	T11_10,11
Seepage Points (or) Ponded Water / Vegetation Established		K1	Top surface, close to SW corner.		8m²	NA		<1	Single grouping. A.	Smaller than previously noted.	Likely no effect on overall stability	T11_64,20
		K4	Centred on SE corner, extending across S and E slopes.		1570m²	NA		~4%	Densest at corner, sparsens it progresses across. Multiple types of vegetation. A.	Larger than previously noted.		T11_25,26
Debris and/or Liner Exposed	N											
Presence & Condition of Monitoring Instruments	Y	NA	Across landfill (VTs) Outside landfill footprint (MWs)		NA	NA	NA	NA	VT-5 through-8 MW-9 through-12	consistent.	No obvious damage	T11_1,22,33,39,56,60
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	N										Several features noted as erosion or settlement could potentially be due to vehicles/construction especially on E crest (material is softer). People present in areas at time of inspection, from Kug.	

APPENDIX F

QA/QC Discussion of Results

QUALITY ASSURANCE/QUALITY CONTROL

A Quality Assurance/Quality Control (QA/QC) program was implemented to monitor the quality of the analytical results. The main objective of this QA/QC program is to ensure that sampling data and analytical results are complete, precise, representative and comparable.

Soil analyses were carried out by Bureau Veritas Laboratories (BV Labs, formerly Maxxam Analytics). The analysis of PHC and inorganic soil parameters listed above were conducted at BV Lab's facility in Edmonton, Alberta, while the analysis of PCB soil parameters were conducted at BV Lab's facility in Calgary, Alberta. Both Alberta laboratories are ISO 17025 certified. All results are presented in the table to this Appendix (Appendix F, Table 1 for soil and Table 2 for groundwater, and Table 3 for field, trip, and equipment blanks).

SHIPPING AND TRANSPORTATION

Samples were kept in coolers and shipped to the BV's depot in Yellowknife, NT, within 24-hours after Arcadis field staff arrived back in Cambridge Bay, NU.

Sample Temperatures

All BV Lab cooler temperatures were within the acceptable range of less than 10 degree Celsius.

Sample Holding Times

Sample holding times were met for all samples submitted to BV Labs with the exception of the Trip Blank sample. The Trip Blank sample was analyzed past the method specified hold time for BTEX/F1 in water. Please refer to the discussion on Trip Blank samples found below.

Sample Containers

All samples arrived in good condition and no breakages were reported. All soil and groundwater samples were collected in the sample containers both supplied and required by the project laboratory.

SAMPLING METHODOLOGIES

Soil

Samples were collected from test pits that had been manually excavated with hand tools (pickaxe and stainless-steel shovel), which were decontaminated between locations using Alconox and distilled water. Each soil sample was collected in one laboratory supplied zip-top plastic bag, two

125 mL glass jars, and two 40 mL clear glass vials with methanol for preservation. All sample containers were pre-sterilized and supplied by the laboratory.

Groundwater

The purging and sampling of each monitoring well was completed using dedicated sampling equipment consisting of 6 mm diameter high density polyethylene (HDPE) tubing. Each well was purged and sampled using dedicated tubing supplies which were removed upon completion of sampling to prevent damage due to freezing. Other sampling equipment, such as the interface probe and the Horiba U-52 multi-parameter meter, were decontaminated between monitoring events using Alconox and distilled water.

Sample Preservation

Soil samples for PHC F1 were preserved with methanol.

Groundwater samples for inorganics were not preserved and were not field filtered. Groundwater samples for PHCs were preserved with sodium bisulfate.

SAMPLE METHOD DETECTION LIMITS (MDLS)

Arcadis made all attempts to meet every required DEW Line specific MDL, including contacting the contract laboratory and providing a copy of the TOR Annex I – Dew Line Clean-up for Soil and Minimum MDL Requirements during the bottle order process and again prior to the start of the program. In addition, Arcadis also included a printout of the Minimum MDL Requirements with the chains of custody in each cooler that accompanied the coolers to the contract laboratory. Furthermore, a note was added to each chain of custody stating that special MDLs were required. However, DEW Line Minimum MDLs were not met for all samples. Samples results with MDLs above the DEW Line Minimum MDLs are summaries below.

The MDLs for soil samples P3-5B and P3-11A were raised above the DEW Line Minimum MDLs for PHC F1 through F4 results due to the presence of high moisture content (i.e., >50% moisture). The raised MDLs of these two samples were below the ‘baseline mean plus three standard deviations’ concentrations for each parameter and are not considered to negatively bias the sample results. As such, these sample results should be considered as reliable.

The MDLs for soil samples P3-5B, P3-7B, P3-8B, P3-11A, P3-11B and P3-19B were raised for PCBs results due to the presence of high moisture content (>50% moisture); however, the raised MDLs of all six samples remained below the DEW Line Minimum MDLs. As such, these sample results should be considered as reliable.

QA/QC RESULTS SAMPLE FOR FIELD DUPLICATES

All field duplicate samples were given IDs similar to the IDs used for all other samples in order to prevent the lab from knowing which samples were duplicates.

Blind field duplicates were obtained for at least 10% of the soil samples collected. However, duplicates were only obtained at a frequency of approximately 9% of the groundwater samples collected, due to an incorrect interpretation of the TOR QA/QC requirement

Sampling procedures and laboratory analytical precision are evaluated by calculating the relative percent difference (RPD) for a sample and duplicate pair according the following equation:

$$RPD = | X_1 - X_2 | / X_{avg} \times 100$$

where: x_1 and x_1 are the duplicate concentrations and x_{avg} is the mean of these two values.

The duplicate results were evaluated using criteria developed by Zeiner (1994), which draws from several data validation guidelines developed by the United States Environmental Protection Agency (USEPA).

RPDs are typically calculated only when both results are greater than 5x the laboratory Reliable Detection Limit (RDL) for each sample concentration. This alert criteria results in less uncertainty for concentrations that are very close to the RDL.

As discussed at the 2019 kick-off meeting, DND re-evaluated the acceptance criteria for field duplicates outlined in Section 1.2 in Annex K of the TOR. Accordingly, analyte RPDs that vary by less than 40% for water or less than 60% for soil were considered acceptable for the 2019 program.

Soil samples were compared against their respective duplicate samples. The following provides a summary of the duplicate analysis.

Soil

A total of six duplicate samples were collected and analyzed at the PIN-3 site. All calculable RPDs for all parent and duplicate soil samples were less than 60%. The analytical results are included in Table 2 in Appendix F following this text. It is Arcadis' opinion that the overall soil sample set should be considered reliable.

It should be noted that the RPD for many of the field duplicate data points were not calculated because one or both results were less than 5 x MDL or below the reportable detection limit. When the field duplicate sample and the parent sample had identical soil sample results, an RPD value was also not assigned.

Heterogeneity is common in surface soil samples and such surface samples results often have RPDs greater than 25%. Arcadis suspects that these discrepancies may also be a result of the use of the laboratory extraction method, which includes first drying the sample, then grinding the sample, and finally sieving the sample. The act of grinding the sample can create disproportionate amounts of metals based on the exact rock type present during the grinding process. The PIN-3 site is especially vulnerable to this, considering many of the collected samples were gravel with very coarse sand at best. A few selected photos are provided below as examples of the types of sample media encountered.

Photo 1 – Sample media at P3-11



Photo 2 – Sample media at P3-16



Large relative percent difference numbers are often a result of low concentrations being measured and variation between samples is likely due to heterogeneity of the substrate. The Arcadis field assessor alternated the placement of small amounts of sample into the primary and duplicated sampling jars; however, this does not guarantee equal allocation of sample, especially in gravel soils, making the collection of a true soil duplicate difficult. Small amounts of metal may have been collected with soil, despite the efforts to exclude debris by the field assessor.

The largest RPD calculated for soil was associated with the PHC F3 concentration for parent sample P3-16A and duplicate sample P3-18. Arcadis suspects that this discrepancy may have been due to a difference in the amount of organic material in each sample as the elevated PHC F3 concentrations are believed to be the result of natural biogenic organic compounds. It is worth noting that organic material was observed to be present in both samples and that limited quantities of fine-grained inorganic materials were encountered at station P3-16 as shown in Photo 3.

Photo 3 – Sample media at P3-16



Groundwater

One duplicate sample (MW-17) was submitted for groundwater at monitoring well MW-12. All analytes for the parent and duplicate groundwater sample reported RPDs less than 40%. The analytical results are included as Table 2 in Appendix F following this text. It is Arcadis' opinion that the overall groundwater sample set should be considered reliable.

Trip, Field, and Equipment Blanks

One trip blank, one field blank, and two equipment blanks were collected as part of the 2019 QA/QC program. The analytical results are included as Table 3 in Appendix F following this text.

The field blank was collected in the field by transferring laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), into the appropriate laboratory supplied sampling containers.

Two sets of equipment blanks were collected. The first set (Equipment Blank 1) was collected by pumping laboratory-supplied reverse osmosis distilled (RODI) water, guaranteed to be free of any organic and inorganic contaminants (based on analysis), through new tubing from the same batch that was used to sample the groundwater wells and into laboratory supplied sample containers. The second set (Equipment Blank 2) was collected by pouring laboratory supplied RODI water over the stainless-steel shovel that was used to dig the test pits and allowing the water to drain into laboratory supplied sample containers.

Equipment Blank 1

Detectable levels of chromium and copper were measured in Equipment Blank 1. The chromium and copper concentration detected were 0.0072 mg/L and 0.00047 mg/L respectively. These minor detections are not considered significant enough to impact any of the analytical sample results; therefore, the groundwater sample results should be relied upon. No other detections were reported for the remaining parameters of Equipment Blank 1.

Equipment Blank 2

A detectable amount of PHC F1 was measured in Equipment Blank 2. The PHC F1 concentration detected was 0.031 mg/L, where the detection limit was 0.015 mg/L. This elevated detection of 0.031 mg/L is not considered to have impacted any of the analytical sample results as all PHC F1 results for soil were below the MDL; therefore, the soil sample results should be relied upon. No other detections were reported for the remaining parameters of Equipment Blank 2.

Field Blank

A detectable amount of PHC F1 was measured in the Field Blank. The PHC F1 concentration detected was 0.058 mg/L, where the detection limit was 0.015 mg/L. This detection of 0.058 mg/L is considered possibly significant as the 'the baseline mean plus three standard deviations' value for PHC F1 in water at the PIN-3 site is 0.05 mg/L; however, we note that this PHC F1 baseline mean plus three standard deviations value was set very low- equal to the laboratory detection limit for the baseline program as the standard deviation was determined to be zero. The source of PHC F1 contamination in the Field Blank is unknown. Given that a clean pair of nitrile gloves were worn before the field blank was collected, the source of the sample contamination is suspected to be either related to airborne particles or contamination to the RODI water or sample vials or laboratory carryover during sample analyses. Although no evidence of cross

contamination was observed at the time, it is worth noting that the same RODI water poured over the sampling shovel for Equipment Blank 2, which also had elevated PHC F1 concentrations, was then used to fill the field blank later in the day on August 18, 2019.

No other detections were reported for the remaining parameters of the Field Blank.

Trip Blank

No detections were reported in the trip blank. However, it should be noted that the Trip Blank sample was analyzed past the method specified hold time for BTEX/F1 in water which is set at 14 days. The trip blank was prepared by the laboratory on 12 August 2019. Due to the need for laboratory pre-preparation, and the field delays encountered in getting to the PIN-3 site, and normal delays in the receipt of shipped samples at the Alberta laboratory, the inability to meet the required hold time on the trip blank was considered to be expected given the constraints of northern DEW Line field work.

LABORATORY QA/QC REPORTING

Arcadis reviewed the internal laboratory QA/QC reporting presented in the Certificates of Analysis for both soil and groundwater samples. The following items of note were identified as part of this review.

1. The internal laboratory RPD between copper and zinc concentrations detected in parent soil sample P3-13B and internal laboratory duplicate 'P3-13A Lab-Dup' exceeded the acceptance criteria of 30% due to sample non-homogeneity. A re-analysis of the samples was then conducted by the laboratory, but similar results were obtained. As noted previously, discrepancies between the concentration of inorganic parameters in parent and duplicate soil samples are often a result of the use the laboratory extraction method, which includes first drying the sample, then grinding the sample, and finally sieving of the sample. The act of grinding the sample can create disproportionate amounts of metals based on the exact rock type present during the grinding process. No other RPD exceedances were calculated for the internal laboratory duplicate associated with the PIN-3 soil samples.

2. All calculable RPDs for the internal laboratory duplicate associated with PIN-3 groundwater samples were below the laboratory QC limits of 20% and 30% for organic and inorganic parameters respectively.

3. All results for the laboratory matrix spikes, spiked blanks, and method blanks were within laboratory QC limits for both soil and groundwater sample batches.

Based on these findings, the internal laboratory QA/QC conducted was deemed acceptable by Arcadis.

LABORATORY ACCREDITATION

The Scope of Accreditation certificates for both BV Labs analytical Calgary and Edmonton laboratories (as issued by the Standards Council of Canada), which were used to analyze samples obtained following from our 2019 PIN-3 field work are located in **Appendix F3**. Soil samples for PHCs and Inorganics were analyzed at the Edmonton BV facility while PCB analyses was conducted at the Calgary BV facility. Groundwater samples were analyzed at the Edmonton BV facility. All are ISO 17025 certified laboratories.

CONCLUSION

Overall, the results of the quality assurance and quality control measures are considered acceptable and generally fall within the DEW Line criteria outline in the TOR Annex K. Although the PHC F1 concentration detected in the Field Blank sample was considered elevated, this result is not suspected to have impacted the accuracy of other PHC F1 results associated with PIN-3 soil or groundwater samples in 2019. As such, Arcadis concluded that both the groundwater and soil data sets should be considered reliable and appropriate for reference purposes.

APPENDIX F1

QA/QC Tables

Summary of 2019 Soil Duplicate Analytical Data																
Sample ID	Location	Year	Depth (cm)	As [mg/kg]	Cd [mg/kg]	Cr [mg/kg]	Co [mg/kg]	Cu [mg/kg]	Pb [mg/kg]	Ni [mg/kg]	Zn [mg/kg]	PCBs [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	F4 C_{16}-C_{34} [mg/kg]
DEW Line MDLs				1	0.5	1	1	1	1	1	1	0.05	7	4	8	6
MDL (BV Labs)				1.0	0.050	1.0	0.50	1.0	0.50	1.0	1.0	0.010	3.5	3.0	5.5-6.4	3.9
Background				1.0	1.0	20.0	5.0	12.6	10.0	6.7	16.4	0.10	N/A	N/A	N/A	N/A
P3-11B	P3-11	2019	40-50	1.4	<0.050	6.2	2.7	16.0	2.2	5.1	7.9	<0.050	<3.5	3.8	12	<4.7
P3-19B (Dup)				1.8	<0.050	5.8	2.5	13.0	2.1	4.8	7.3	<0.050	<3.5	<3.0	<6.4	<4.7
RPD (Parent and Dup)				--	--	6.7%	7.7%	20.7%	-	-	7.9%	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
MW-13B	MW-13	2019	40-50	<1.0	<0.050	3.3	1.4	7.2	1.7	2.5	4.8	<0.010	<3.5	<3.0	25	<4.7
MW-18B (Dup)				<1.0	<0.050	3.8	1.3	6.9	1.6	2.4	4.1	<0.010	<3.5	3.1	28	6.9
RPD (Parent and Dup)				--	--	--	--	4.3%	--	--	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
MW-14B	MW-14	2019	20-30	2.1	<0.050	2.9	1.2	4.2	1.2	3.1	4.9	<0.010	<3.5	<3.0	11	<4.7
MW-19B (Dup)				2.0	<0.050	3.0	1.3	3.7	1.0	2.8	4.0	<0.010	<3.5	<2.0	17	<3.9
RPD (Parent and Dup)				--	--	--	--	--	--	--	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
MW-12B	MW-12	2019	40-50	1.1	<0.050	4.5	2.2	13.0	1.3	4.0	6.5	<0.010	<3.5	<3.0	12	<4.7
MW-17B (Dup)				<1.0	<0.050	3.9	2.0	12.0	1.2	4.0	5.7	<0.010	<3.5	3.0	19	<4.7
RPD (Parent and Dup)				--	--	--	--	8.0%	--	--	13.1%	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Summary of 2019 Soil Duplicate Analytical Data																
Sample ID	Location	Year	Depth (cm)	As [mg/kg]	Cd [mg/kg]	Cr [mg/kg]	Co [mg/kg]	Cu [mg/kg]	Pb [mg/kg]	Ni [mg/kg]	Zn [mg/kg]	PCBs [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	F4 C_{16}-C_{34} [mg/kg]
DEW Line MDLs				1	0.5	1	1	1	1	1	1	0.05	7	4	8	6
MDL (BV Labs)				1.0	0.050	1.0	0.50	1.0	0.50	1.0	1.0	0.010	3.5	3.0	5.5-6.4	3.9
P3-13A	P3-13	2019	0-15	1.2	<0.050	2.7	0.9	2.9	1.9	2.1	6.1	<0.010	<3.5	3.7	39	8.7
P3-17A (Dup)				1.2	<0.050	2.7	1.0	3.4	2.4	3.0	5.5	<0.010	<3.5	3.2	46	8.9
RPD (Parent and Dup)				--	--	--	--	--	--	--	10.3%	--	--	--	16.5%	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
P3-16A	P3-16	2019	0-50	2.9	<0.050	3.7	1.6	13.0	4.8	7.6	8.0	<0.010	<3.5	23.0	100	23.0
P3-18A (Dup)				2.2	<0.050	3.1	1.5	11.0	4.0	6.1	7.4	<0.010	<3.5	9.2	55	11.0
RPD (Parent and Dup)				--	--	--	--	16.7%	18.2%	21.9%	7.8%	--	--	--	58.1%	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

-- Not calculated (nc) - meets criteria (note that RPDs calculated only when both samples are greater than 5x MDL)

Y Meets criteria (RPD <60%)

N Does not meet criteria

Summary of 2019 Groundwater Duplicate Analytical Data														
Sample ID	**Location**	**Year**	**As** [mg/L]	**Cd** [mg/L]	**Cr** [mg/L]	**Co** [mg/L]	**Cu** [mg/L]	**Pb** [mg/L]	**Ni** [mg/L]	**Zn** [mg/L]	**F1** C_6-C_{10} [mg/L]	**F2** C_{10}-C_{16} [mg/L]	**F3** C_{16}-C_{34} [mg/L]	**F4** C_{16}-C_{34} [mg/L]
DEW Line MDLs			0.001	0.0001	0.001	0.0005	0.005	0.0001	0.001	0.001	0.025	0.1	0.1	0.1
MDL (BV Labs)			0.00020	0.000020	0.0010	0.00030	0.00020	0.00010	0.00050	0.0030	0.015	0.020	0.043	0.055
MW-12														
MW-12	MW-12	2019	0.00031	<0.000020	0.0047	<0.00030	0.0037	0.0040	0.0046	0.0130	0.04	<0.020	<0.043	<0.055
MW-17 (Dup)			0.00035	<0.000020	0.0045	0.0003	0.0035	0.0040	0.0045	0.0130	0.03	<0.020	<0.043	<0.055
RPD (Parent and Dup)			--	--	--	--	5.6%	--	2.2%	--	--	--	--	--
Aceptable (Y/N)			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

-- Not calculated (nc) - meets criteria (note that RPDs calculated only when both samples are greater than 5x MDL)

Y Meets criteria (RPD <40%)

Summary of 2019 Field, Trip and Equipment Blanks													
Sample ID	**Year**	**As [mg/L]**	**Cd [mg/L]**	**Cr [mg/L]**	**Co [mg/L]**	**Cu [mg/L]**	**Pb [mg/L]**	**Ni [mg/L]**	**Zn [mg/L]**	**F1 C_6-C_{10} [mg/L]**	**F2 C_{10}-C_{16} [mg/L]**	**F3 C_{16}-C_{34} [mg/L]**	**F4 C_{16}-C_{34} [mg/L]**
DEW Line MDLs		0.001	0.0001	0.001	0.0005	0.005	0.0001	0.001	0.001	0.025	0.1	0.1	0.1
MDL (BV Labs)		0.00020	0.000020	0.0010	0.00030	0.00020	0.00010	0.00050	0.0030	0.015	0.020	0.043	0.055
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Field, Trip and Equipment Blank Analyses - BV Labs													
Field Blank	2019	<0.00020	<0.000020	<0.0010	<0.00030	<0.00020	<0.00010	<0.00050	<0.0030	0.058	<0.020	<0.043	<0.055
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Trip Blank		<0.00020	<0.000020	<0.0010	<0.00030	<0.00020	<0.00010	<0.00050	<0.0030	<0.015	<0.020	<0.043	<0.055
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Equipment Blank 1		<0.00020	<0.000020	0.0072	<0.00030	0.00047	<0.00010	0.00059	<0.0030	<0.015	<0.020	<0.043	<0.055
Aceptable? (Y/N)		Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y
Equipment Blank 2		<0.00020	<0.000020	<0.0010	<0.00030	<0.00020	<0.00010	<0.00050	<0.0030	0.031	<0.020	<0.043	<0.055
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y

Notes:

-- Not calculated - meets criteira

Y Meets criteria

N Does not meet criteria

APPENDIX F2

Chains of Custody

Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS "INVOICE TO"	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970514	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-02-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email	TROY.AUSTRINS@ARCADIS.COM	Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria
NOTIFY THE LAB FOR REQUIRED DLS AS PER THE ATTACHED DOCUMENT.
CONTACT P. VIRK IF THERE ARE ANY QUESTIONS REGARDING MDLS

Special Instructions
METALS: ONLY REPORT As, Cd, Cr, Co, Cu, Pb, Ni, ZINC.
PHCs: ONLY REPORT F1, F2, F3, AND F4 (i.e. NO BTEX)

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ [ ]
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCBs (Total Aroclors)	# of Bottles	Comments
1		MW-9A	19/08/16	9:40	S			X	X	X	5	
2		MW-9B	19/08/16	9:40	S			X	X	X	5	
3		MW-10A	19/08/16	10:10	S			X	X	X	5	
4		MW-10B	19/08/16	10:10	S			X	X	X	5	
5		MW-11A	19/08/16	10:30	S			X	X	X	5	Received in Yellowknife
6		MW-11B	19/08/16	10:30	S			X	X	X	5	By: [signature]
7		MW-12A	19/08/16	11:00	S			X	X	X	5	AUG 22 2019 @10:05
8		MW-12B	19/08/16	11:00	S			X	X	X	5	
9		MW-17B	19/08/16	11:30	S			X	X	X	5	Temp: ACTR
10		MW-5A	19/08/17	9:20	S			X	X	X	5	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[signature] TestAm	2019/08/23	1120		[ ]	See ACTR	[ ] Yes [ ] No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-07-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4	Total Metals	PCBs	# of Bottles	Comments
1		MW-5B	19/08/17	9:20	S			X	X	X	5	
2		MW-6A	19/08/17	9:40	S			X	X	X	5	
3		MW-6B	19/08/17	9:40	S			X	X	X	5	
4		MW-7A	19/08/17	10:00	S			X	X	X	5	
5		MW-7B	19/08/17	10:00	S			X	X	X	5	
6		MW-8A	19/08/17	10:20	S			X	X	X	5	
7		MW-8B	19/08/17	10:20	S			X	X	X	5	
8		P3-1A	19/08/17	18:40	S			X	X	X	5	
9		P3-1B	19/08/17	18:40	S			X	X	X	5	
10		P3-2A	19/08/17	17:40	S			X	X	X	5	

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ *(call lab for #)*

Received in Yellowknife
By: [signature]
AUG 22 2019 @ 16:05
Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	TCSt Ali	2019/08/23	1120				Yes / No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-08-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4	TOTAL METALS	PCBs	# of Bottles	Comments
1		P3-2B	19/08/17	17:40	S			X	X	X	5	
2		P3-3A	19/08/17	18:00	S			X	X	X	5	
3		P3-3B	19/08/17	18:00	S			X	X	X	5	
4		P3-4A	19/08/17	18:20	S			X	X	X	5	
5		P3-4B	19/08/17	18:20	S			X	X	X	5	Received in Yellowknife
6		~~P3~~ MW-13A	19/08/18	10:10	S			X	X	X	5	By:
7		MW-13B	19/08/18	10:10	S			X	X	X	5	AUG 22 2019 @ 10:05
8		MW-14A	19/08/18	11:10	S			X	X	X	5	
9		MW-14B	19/08/18	11:10	S			X	X	X	5	Temp: ACTR
10		MW-15A	19/08/18	12:20	S			X	X	X	5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
~~ELLIOTT~~ ELLIOTT HOLDEN	19/08/20	10:00	Tashia	2019/08/23	1120	

Lab Use Only: Time Sensitive ☐ | Temperature (ºC) on Receipt: See ACTR | Custody Seal Intact on Cooler? ☐ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
4000 19st N.E. Calgary. Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-09-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Analysis Requested: F1 - F4	METALS	PCBS	# of Bottles	Comments
1		MW - 15 B	19/08/18	12:20	S			X	X	X	5	
2		MW - 16 A	19/08/18	9:10	S			X	X	X	5	
3		MW - 16 B	19/08/18	9:10	S			X	X	X	5	
4		MW - 18 B	19/08/18	10:30	S			X	X	X	5	
5		MW - 19 B	19/08/18	11:30	S			X	X	X	5	Received in Yellowknife
6		P3 - 5 A	19/08/18	18:10	S			X	X	X	5	By:
7		P3 - 5 B	19/08/18	18:10	S			X	X	X	5	AUG 22 2019 @ 10:05
8		P3 - 6 A	19/08/18	17:00	S			X	X	X	5	
9		P3 - 6 B	19/08/18	17:00	S			X	X	X	5	Temp: ALTR
10		P3 - 7 A	19/08/18	17:20	S			X	X	X	5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
ELLIOTT HOLDEN	19/08/20	10:00	TESHALI	2019/08/23	1120	

Lab Use Only: Time Sensitive ☐ | Temperature (°C) on Receipt | Custody Seal Intact on Cooler? ☐ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-10-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1-F4	METALS	PCBS	# of Bottles	Comments
1		P3-7B	19/08/18	17:20	S			X	X	X	5	
2		P3-8A	19/08/18	17:50	S			X	X	X	5	
3		P3-8B	19/08/18	17:50	S			X	X	X	5	
4		P3-9A	19/08/18	15:20	S			X	X	X	5	
5		P3-9B	19/08/18	15:20	S			X	X	X	5	Received in Yellowknife
6		P3-10A	19/08/18	15:40	S			X	X	X	5	By: [illegible]
7		P3-10B	19/08/18	15:40	S			X	X	X	5	AUG 22 2019 @10:05
8		P3-11A	19/08/18	16:20	S			X	X	X	5	
9		P3-11B	19/08/18	16:20	S			X	X	X	5	Temp: ACTR
10		P3-19B	19/08/18	16:40	S			X	X	X	5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) ☐

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[illegible]	2019/08/22	1120		☐	SEE ATR	☐ Yes ☐ No

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	BG0371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201	Address		Project #	30000251	Chain Of Custody Record	Project Manager
	Ottawa ON K2H 8K7			Project Name		C#591564-11-01	Parminder Virk
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Site #	PIN-3		
Email	Jacob.Holden@arcadis.com	Email		Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	F1 - F4	METALS	PCBs	# of Bottles	Comments
1		P3 -12 A	19/08/18	20:20	S			X	X	X	5	
2		P3 - 12 B	19/08/18	20:20	S			X	X	X	5	
3		P3 - 13 A	19/08/18	20:40	S			X	X	X	5	
4		P3 - 13 B	19/08/18	20:40	S			X	X	X	5	
5		P3 - 14 A	19/08/18	20:00	S			X	X	X	5	TIME SAMPLED 21:00
6		P3 - 14 B	19/08/18	21:00	S			X	X	X	5	
7		P3 - 15 A	19/08/18	21:20	S			X	X	X	5	
8		P3 - 15 B	19/08/18	21:20	S			X	X	X	5	
9		P3 - 16 A	19/08/18	21:40	S			X	X	X	5	
10		P3 - 16 B	19/08/18	21:40	S			X	X	X	5	

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____
(call lab for #)

Received in Yellowknife
By: Sam Brown
AUG 22 2019 @10:05
Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	TESHALI	2019/08/23	1120		☐	SEE ACTR	☐ Yes ☐ No

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS PAGE 1	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970574	591564
Address	1050 Morrison Drive Suite 201 Ottawa ON K2H 8K7	Address		Project #	30000251	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#591564-12-01	Parminder Virk
Email	Jacob.Holden@arcadis.com	Email		Site #	PIN-3		
				Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria	Special Instructions
SAME AS PAGE 1	SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	F1 - F4	METALS	PCBs							# of Bottles	Comments
1		P3 - 17A	19/08/18	21:00	S			X	X	X							5	
2		P3 - 18A	19/08/18	22:00	S			X	X	X							5	
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ [ ]
Rush Confirmation Number _____ *(call lab for #)*

Received in Yellowknife
By: [illegible]
AUG 22 2019 @ 10:05
Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[illegible]	2019/08/23	1120		[ ]	See ACTR	[ ] Yes [ ] No

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White: BV Labs Yellow: Client

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BUREAU VERITAS

Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

1177(7)

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS "INVOICE TO"	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970573	591564
Address	1050 Morrison Drive Suite 201	Address		Project #	30000251	Chain Of Custody Record	Project Manager
	Ottawa ON K2H 8K7			Project Name		C#591564-03-01	Parminder Virk
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Site #	PIN-3		
Email	Jacob.Holden@arcadis.com	Email	TROY.AUSTRINS@ARCADIS.COM	Sampled By	Elliott Holden		

Regulatory Criteria
NOTIFY THE LAB FOR REQUIRED DLS AS PER THE ATTACHED DOCUMENT.
CONTACT P. VIRK IF THERE ARE ANY QUESTIONS REGARDING MDLS.

Special Instructions
METALS: ONLY REPORT As, Cd, Cr, Co, Cu, Pb, Ni, Zinc.
PHCS: ONLY REPORT F1, F2, F3, & F4 (i.e. NO BTEX)

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT (will be applied if Rush TAT is not specified) — X
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4 (NO BTEX)	TOTAL As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	# of Bottles	Comments
1		MW-10	19/08/16	16:30	GW		N	X	X	5	GROUND WATER: METALS NOT PRESERVED AND NOT FIELD FILTERED.
2		MW-11	19/08/16	14:30	GW		N	X	X	5	
3		MW-12	19/08/16	15:30	GW		N	X	X	5	ANALYSE FOR TOTAL METALS ONLY.
4		MW-17	19/08/16	17:30	GW		N	X	X	5	THIS COMMENT APPLIES TO ALL SAMPLES LISTED.
5		MW-5	19/08/17	15:20	GW		N	X	X	5	
6		MW-6	19/08/17	16:00	GW		N	X	X	5	Received in Yellowknife By:
7		MW-8	19/08/17	17:00	GW		N	X	X	5	
8		MW-13	19/08/18	11:20	GW		N	X	X	5	AUG 22 2019 @ 10:05
9		MW-14	19/08/18	12:30	GW		N	X	X	5	
10		MW-15	19/08/18	13:30	GW		N	X	X	5	Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	Tosh Ali	2019/08/23	1120		☐	See ACTR	☐ Yes ☐ No

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White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada Inc	Company Name	SAME AS "INVOICE TO"	Quotation #	B60371	BV Labs Job #	Bottle Order #:
Contact Name	Elliott Holden	Contact Name		P.O. #		B970573	591564
Address	1050 Morrison Drive Suite 201	Address		Project #	30000251	Chain Of Custody Record	Project Manager
	Ottawa ON K2H 8K7			Project Name		C#591564-05-01	Parminder Virk
Phone	(613) 721-0555 Ext: 237 Fax: (613) 721-0029	Phone	Fax:	Site #	PIN-3		
Email	Jacob.Holden@arcadis.com	Email	TROY.AUSTRINS@ARCADIS.COM	Sampled By	ELLIOTT HOLDEN		

Regulatory Criteria: SAME AS PAGE 1

Special Instructions: SAME AS PAGE 1

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	F1 - F4 (NO BTEX)	TOTAL As, Cd, Cr, Co, Pb, Ni, Zinc								# of Bottles	Comments
1		MW-16	19/08/18	10:20	GW		N	X	X								5	SAME AS PAGE 1
2		MW-7	19/08/18	18:30	GW		N	X	X								5	
3		FIELD BLANK	19/08/18	19:00	W		N	X	X								5	
4		TRIP BLANK	19/08/12		W		N	X	X								5	
5		EQUIPMENT BLANK 1	19/08/18	14:00	W		N	X	X								5	
6		EQUIPMENT BLANK 2	19/08/18	14:20	W		N	X	X								5	
7																		
8																		
9																		
10																		

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT X

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

Received in Yellowknife
By: [signature]
AUG 22 2019 @ 16:05

Temp: ACTR

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
ELLIOTT HOLDEN	19/08/20	10:00	[signature]	2019/08/22	1120			SOA	Yes / No

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White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

APPENDIX F3

BV Laboratory Accreditation

CERTIFICATE OF ACCREDITATION

Standards Council of Canada
Conseil canadien des normes

CERTIFICAT D'ACCRÉDITATION

Bureau Veritas Canada (2019) Inc.

Petroleum Technology Center

6744 - 50 Street NW, Edmonton, AB, T6B 3M9 and Edmonton Environmental,
9331 48 Street NW, Edmonton, AB, T6B 2R4, Canada

having been assessed by the Standards Council of Canada (SCC) and found to conform with the requirements of ISO/IEC 17025:2017 and the conditions for accreditation established by SCC is hereby recognized as an

ayant fait l'objet d'une évaluation du Conseil canadien des normes (CCN), et ayant été trouvé conforme aux exigences énoncées dans ISO/IEC 17025:2017 et aux conditions d'accréditation établies par le CCN, est de ce fait reconnu comme étant un

ACCREDITED TESTING LABORATORY

LABORATOIRE D'ESSAIS ACCRÉDITÉ

for the specific tests or types of tests listed in the scope of accreditation approved by SCC and found on the SCC website at www.scc.ca.

pour les essais ou types d'essais énumérés dans la portée d'accréditation approuvée par le CCN et figurant dans le site Web du CCN au www.ccn.ca.

Accredited laboratory number: / Numéro de laboratoire accrédité : 160

SCC file number: / Dossier du CCN nº : 15229

Initial accreditation date: / Date de la première accréditation : 1995-03-06

.....

Vice-President – Accreditation Services / Vice-président – Services d'accréditation

Issued on: / Délivré le : 2019-06-07

The validity of this certificate, including the date of last re-accreditation and its expiry can be confirmed by the accompanying Scope of Accreditation document in the Directory of Accredited Laboratories on the SCC website at www.scc.ca.

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. The accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF communiqué dated April 2017).

Pour vérifier la validité du présent certificat, y compris la date de la dernière réaccréditation et la date d'expiration du certificat, consulter la portée d'accréditation qui se trouve dans le répertoire des laboratoires accrédités dans le site Web du CCN au www.ccn.ca.

Ce laboratoire est accrédité conformément à la Norme internationale reconnue ISO/IEC 17025:2017. Cette accréditation démontre la compétence technique d'un organisme pour une portée définie et l'exploitation d'un système de management de la qualité de laboratoire (cf. communiqué conjoint ISO-ILAC-IAF date de avril 2017).

This certificate is the property of the Standards Council of Canada (SCC) and must be returned on request; reproduction is prohibited except on written approval of SCC.
Ce certificat est la propriété du Conseil canadien des normes (CCN) et doit lui être remis sur demande; toute reproduction est interdite sans l'autorisation écrite du CCN.

Canada

CERTIFICATE OF ACCREDITATION

Standards Council of Canada
Conseil canadien des normes

CERTIFICAT D'ACCRÉDITATION

Bureau Veritas Canada (2019) Inc.

Calgary Laboratory

2021 – 41st Avenue, N.E., Calgary, Alberta, T2E 6P2, Canada

having been assessed by the Standards Council of Canada (SCC) and found to conform with the requirements of ISO/IEC 17025:2005 and the conditions for accreditation established by SCC is hereby recognized as an

ACCREDITED TESTING LABORATORY

for the specific tests or types of tests listed in the scope of accreditation approved by SCC and found on the SCC website at www.scc.ca.

ayant fait l'objet d'une évaluation du Conseil canadien des normes (CCN), et ayant été trouvé conforme aux exigences énoncées dans ISO/IEC 17025:2005 et aux conditions d'accréditation établies par le CCN, est de ce fait reconnu comme étant un

LABORATOIRE D'ESSAIS ACCRÉDITÉ

pour les essais ou types d'essais énumérés dans la portée d'accréditation approuvée par le CCN et figurant dans le site Web du CCN au www.ccn.ca.

Accredited laboratory number: / Numéro de laboratoire accrédité : 836

SCC file number: / Dossier du CCN nº : 151043

Initial accreditation date: / Date de la première accréditation : 2016-08-30

.....

Vice-President – Accreditation Services / Vice-président – Services d'accréditation

Issued on: / Délivré le : 2019-06-07

The validity of this certificate, including the date of last re-accreditation and its expiry can be confirmed by the accompanying Scope of Accreditation document in the Directory of Accredited Laboratories on the SCC website at www.scc.ca.

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. The accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF communiqué dated April 2017).

Pour vérifier la validité du présent certificat, y compris la date de la dernière réaccréditation et la date d'expiration du certificat, consulter la portée d'accréditation qui se trouve dans le répertoire des laboratoires accrédités dans le site Web du CCN au www.ccn.ca.

Ce laboratoire est accrédité conformément à la Norme internationale reconnue ISO/IEC 17025:2005. Cette accréditation démontre la compétence technique d'un organisme pour une portée définie et l'exploitation d'un système de management de la qualité de laboratoire (cf. communiqué conjoint ISO-ILAC-IAF date de avril 2017).

This certificate is the property of the Standards Council of Canada (SCC) and must be returned on request; reproduction is prohibited except on written approval of SCC.
Ce certificat est la propriété du Conseil canadien des normes (CCN) et doit lui être remis sur demande; toute reproduction est interdite sans l'autorisation écrite du CCN.

Canada

APPENDIX G

Soil Trend Analysis Graphs

APPENDIX G1

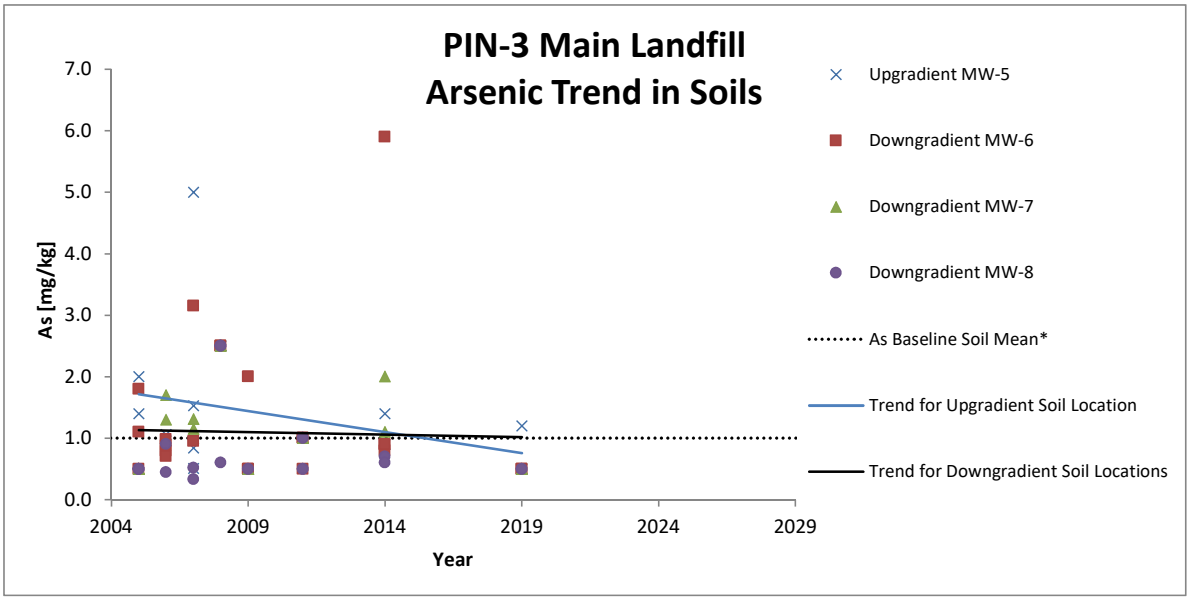
PIN-3 Main Landfill – Trends in Soil Inorganics, PCBs and PHCs

PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

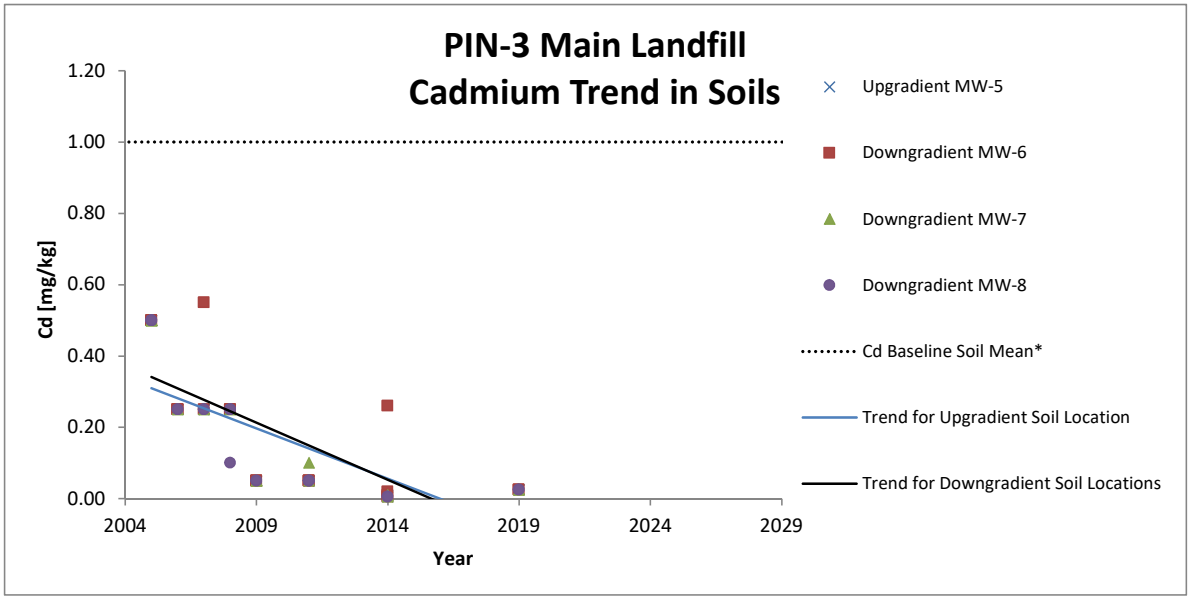
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



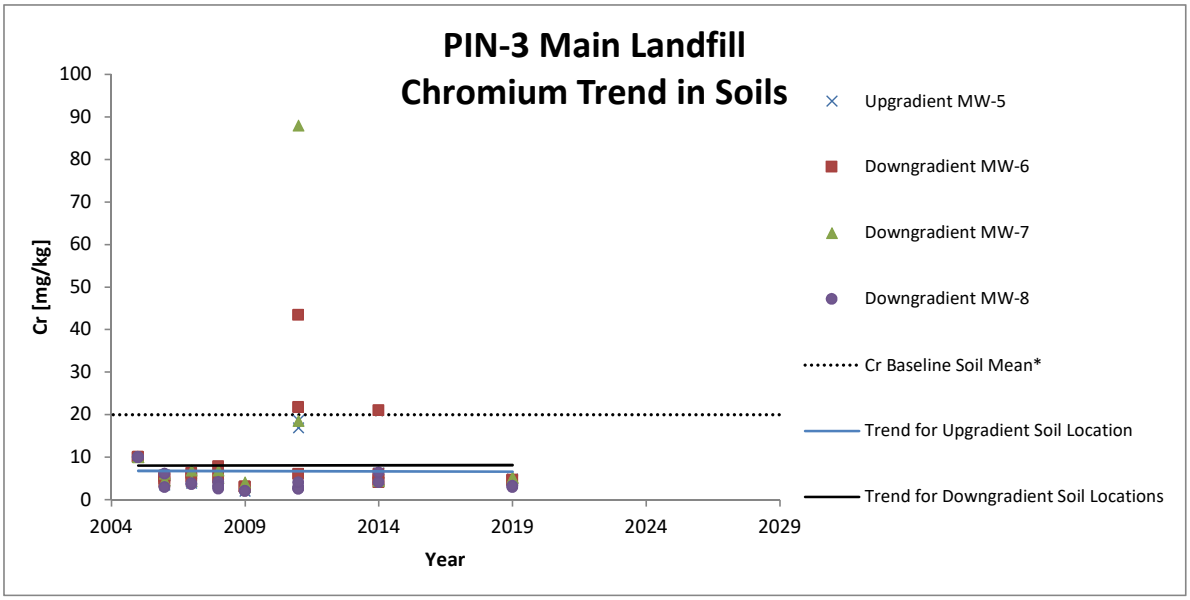
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

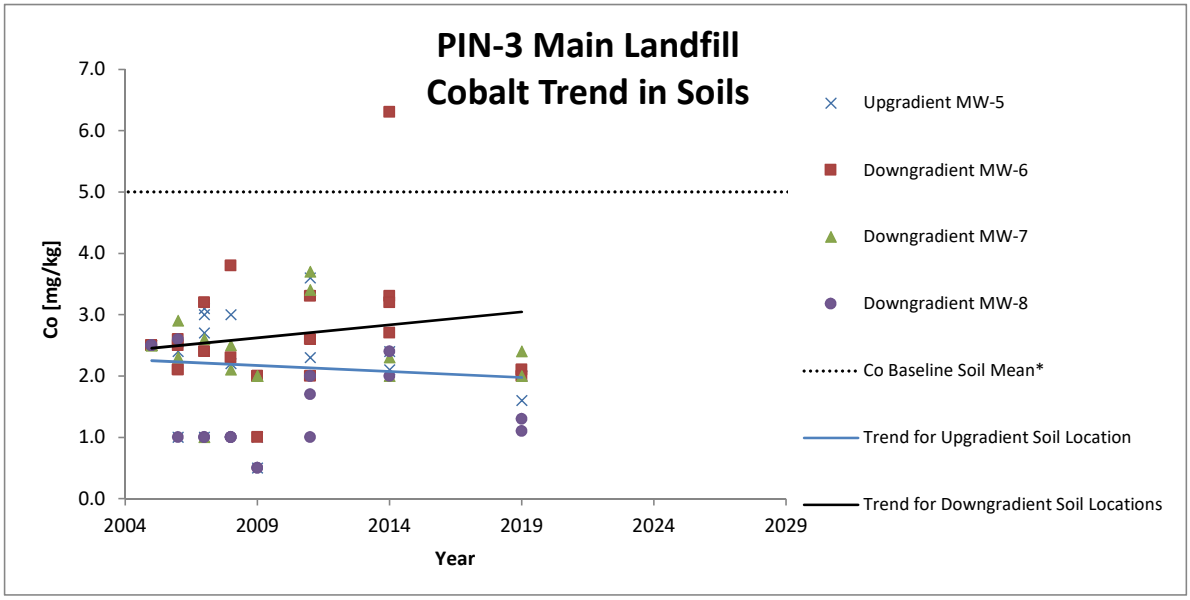
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



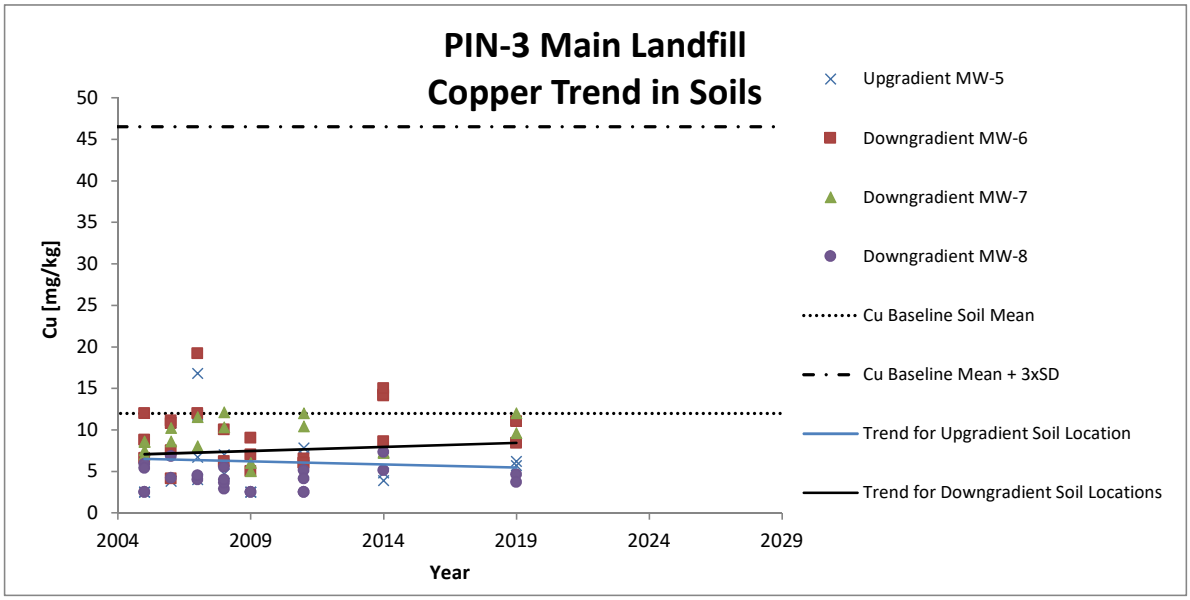
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

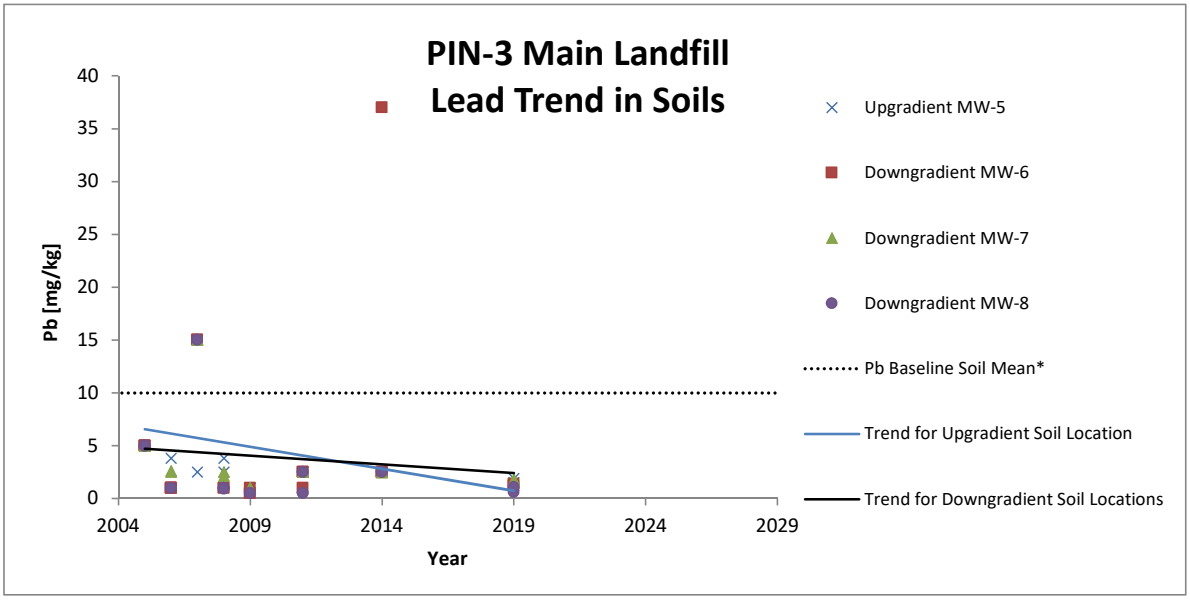
PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





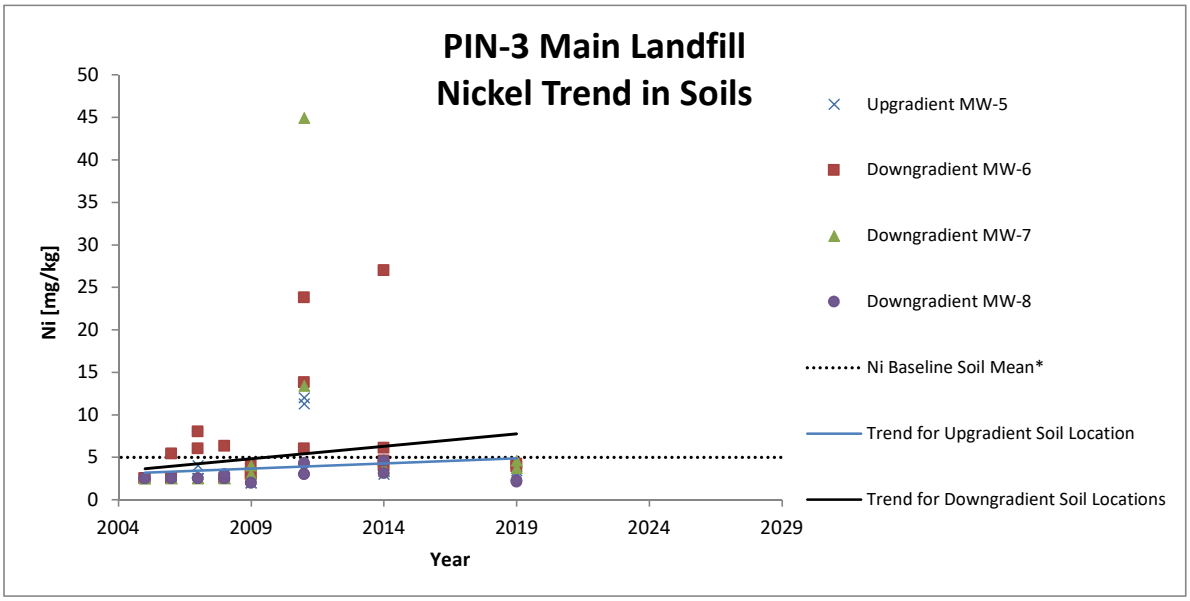
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



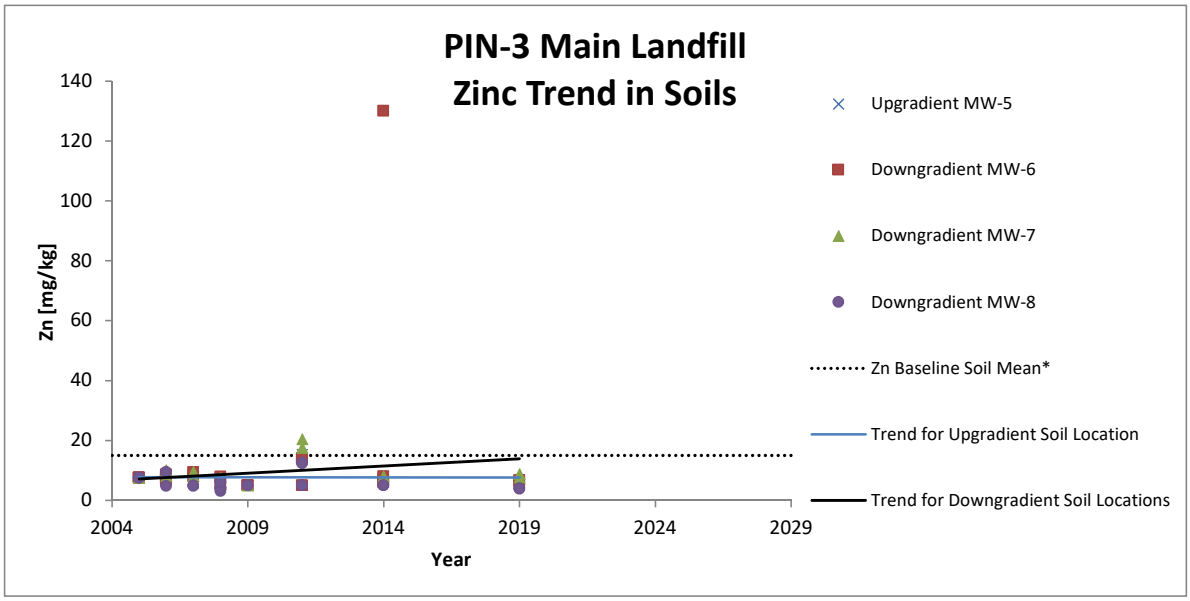
* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0

PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

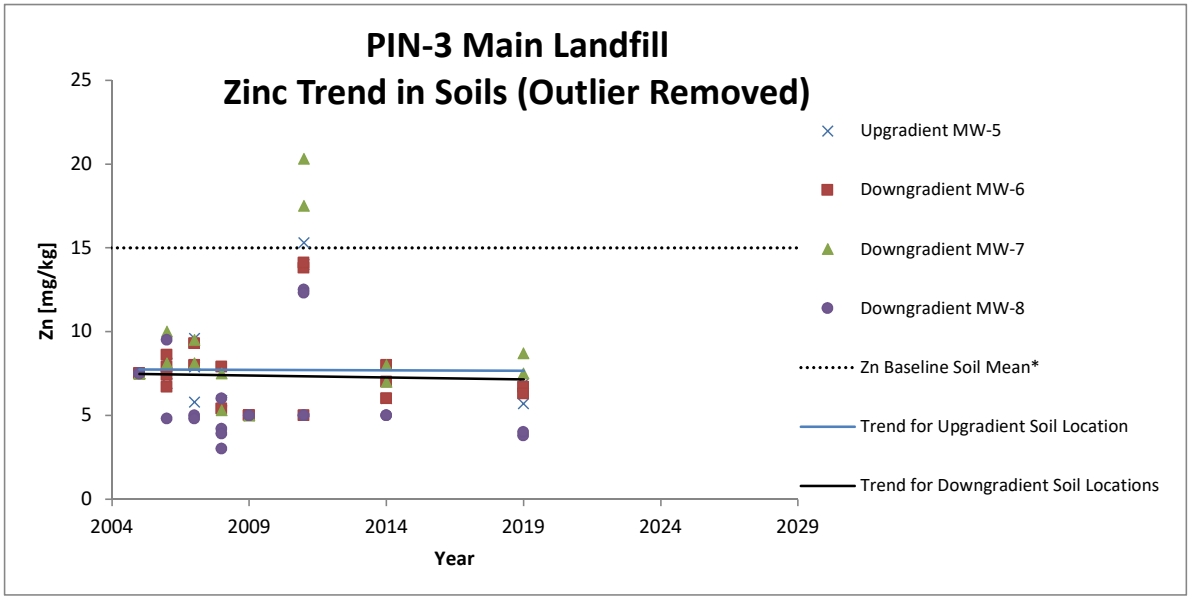
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0



* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

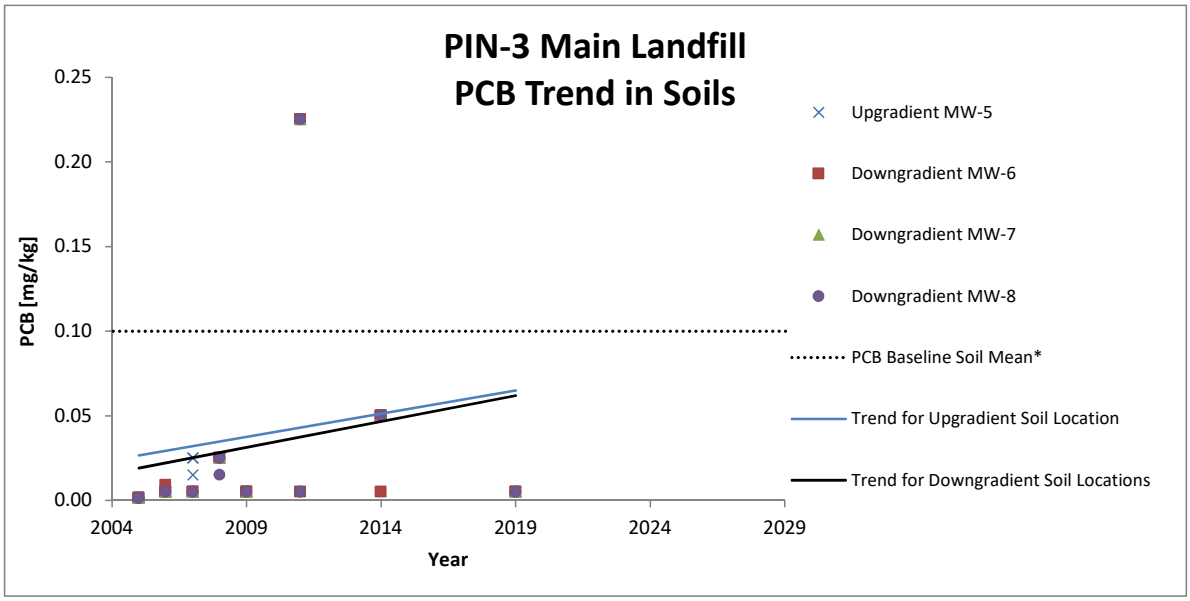
Zn result from downgradient location MW-6 in 2014 is not shown on this chart

PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

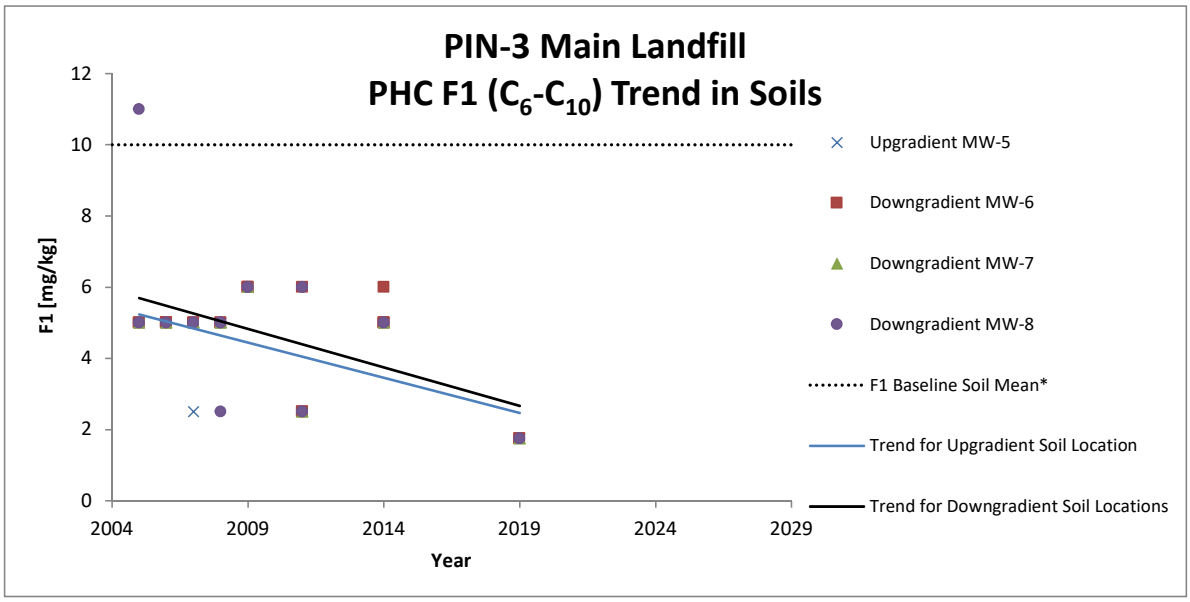
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



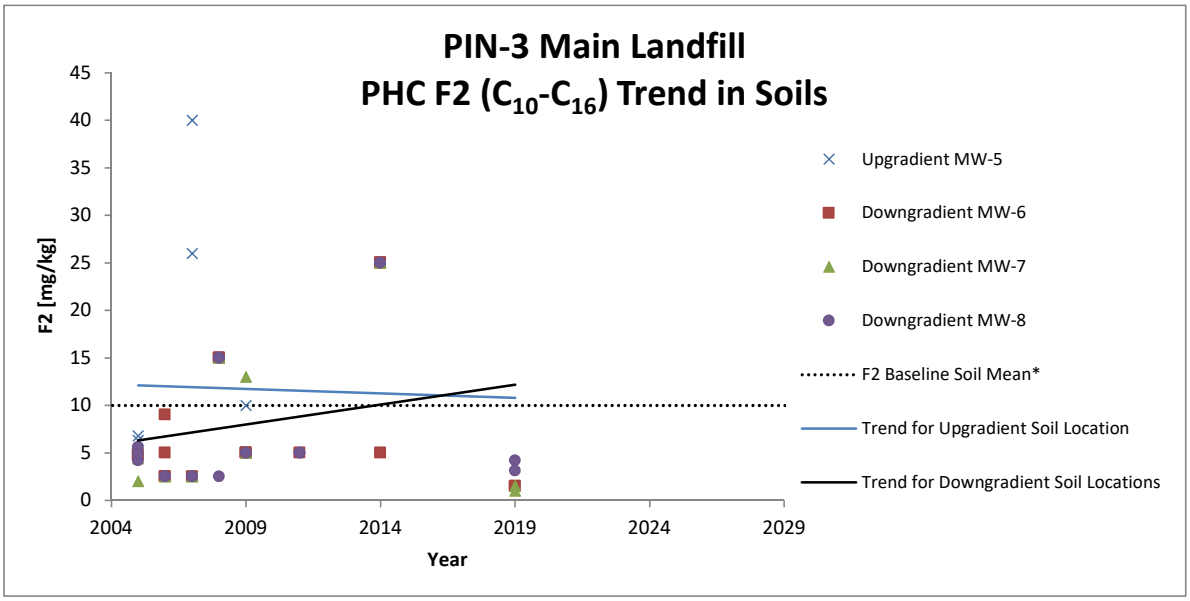
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

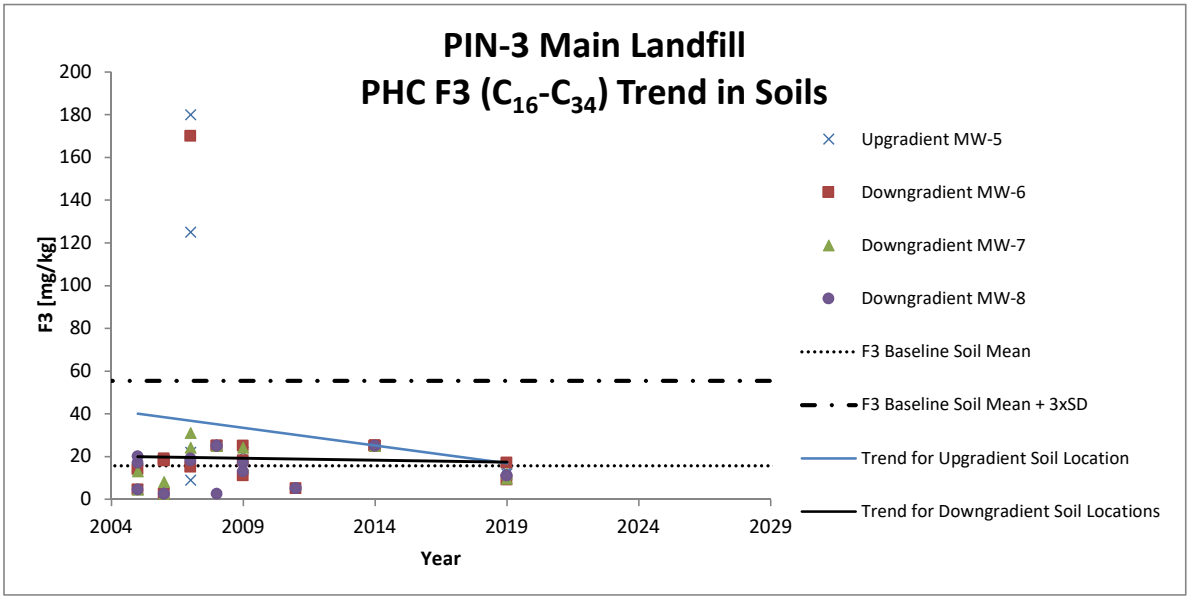
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

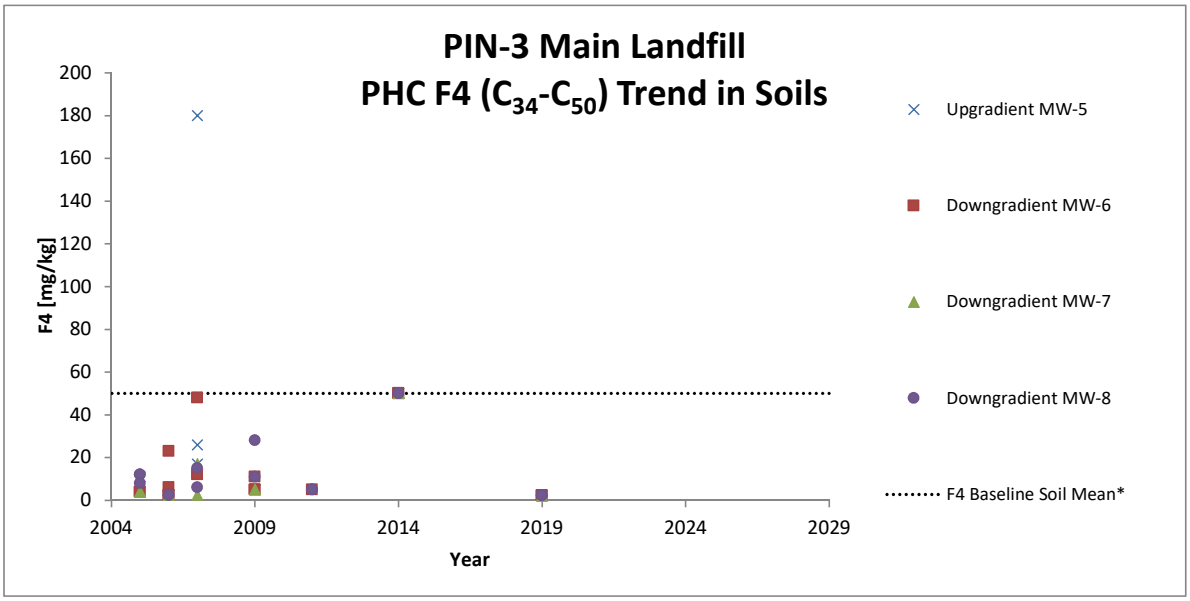


PIN-3 Main Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F4 baseline arithmetic mean is equal to the baseline detection limit
* F4 baseline standard deviation = 0

Trend lines not shown for PHC F4 because 7 years of data not available

APPENDIX G2

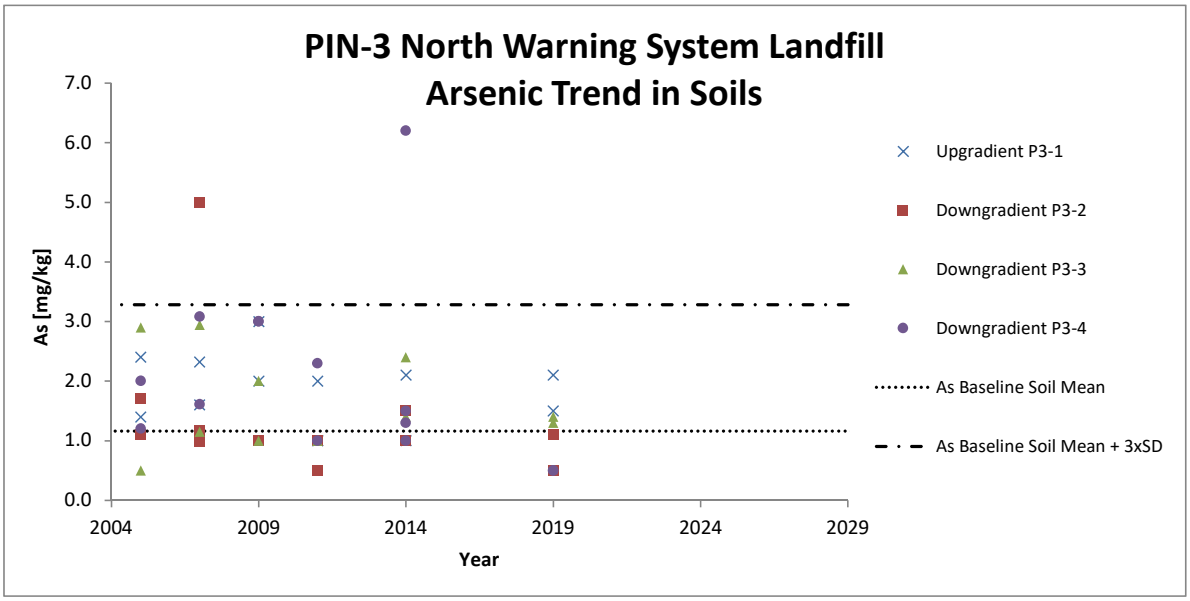
PIN-3 NWS Landfill – Trends in Soil Inorganics, PCBs and PHCs

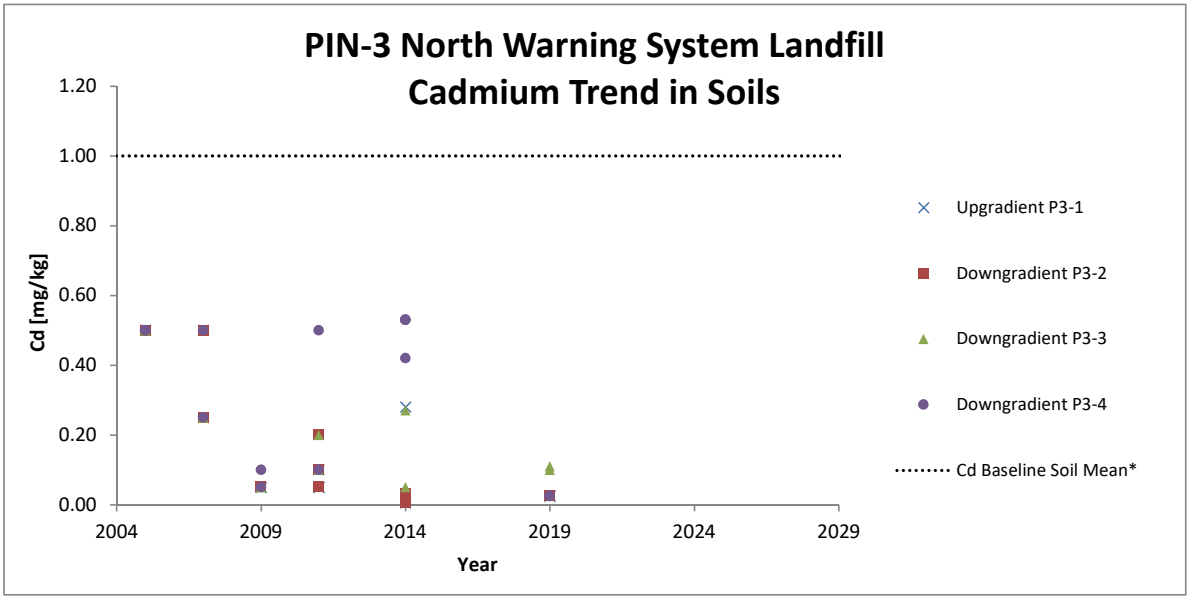
PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





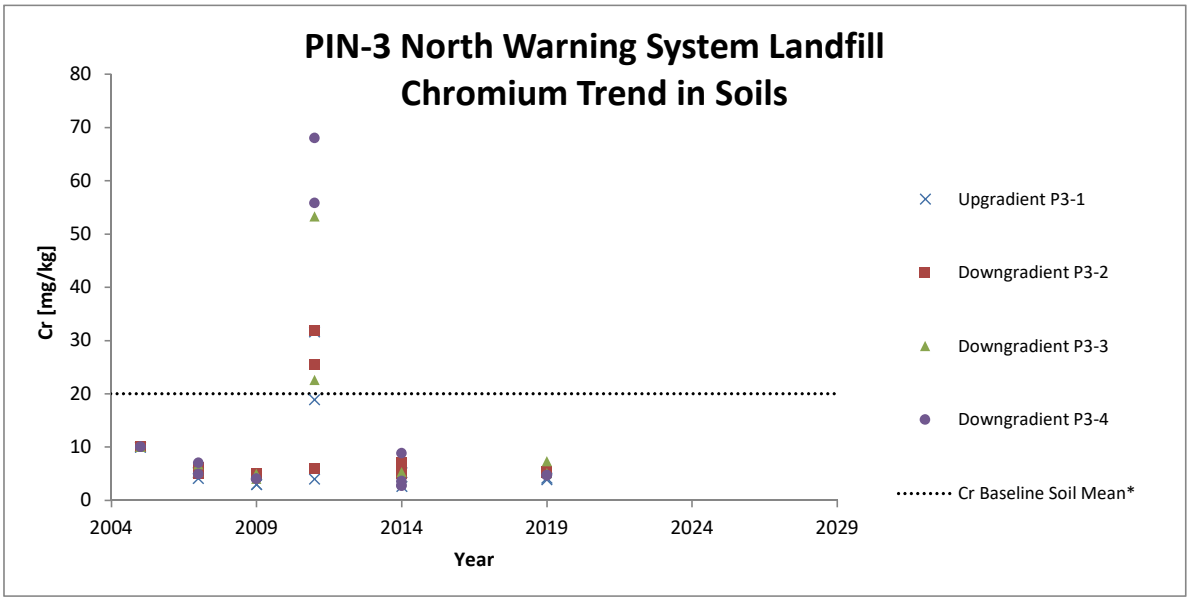
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

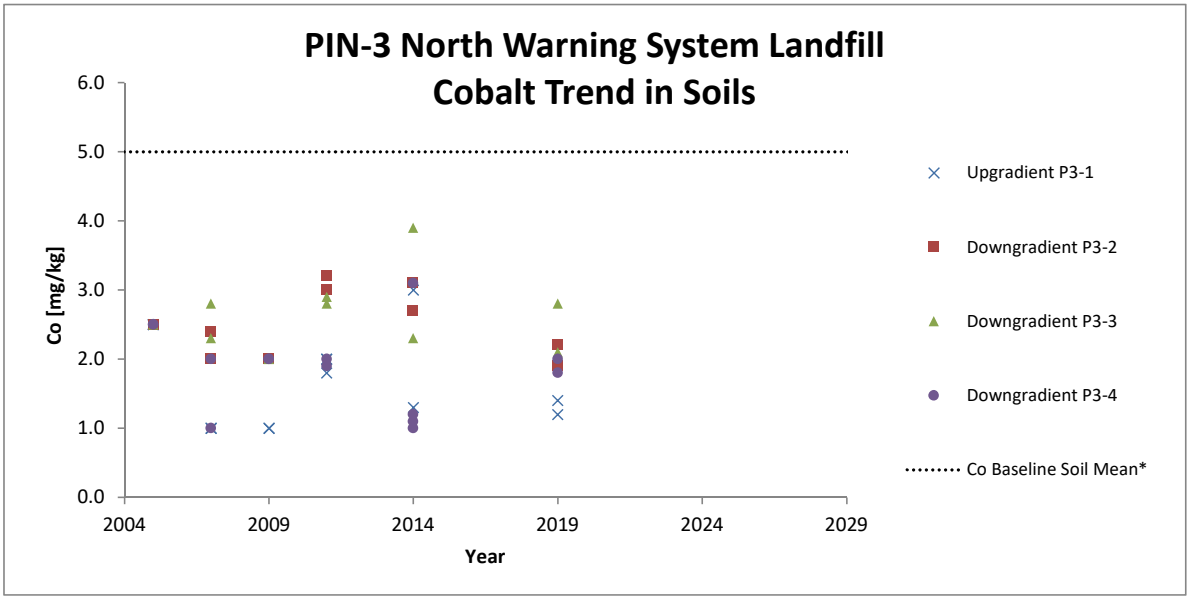
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



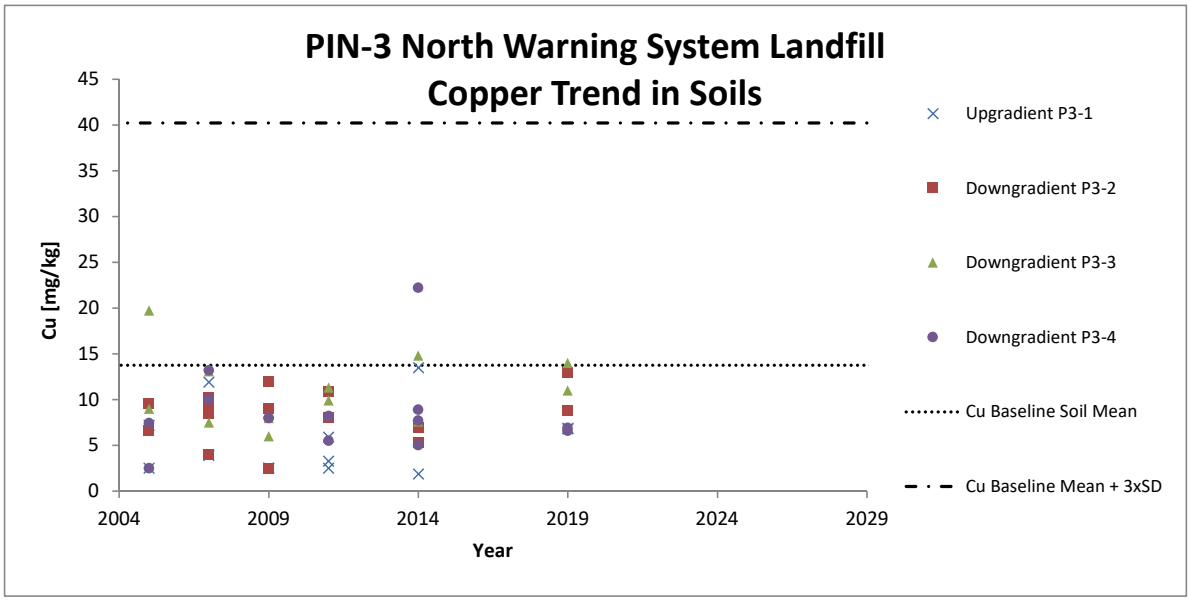
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

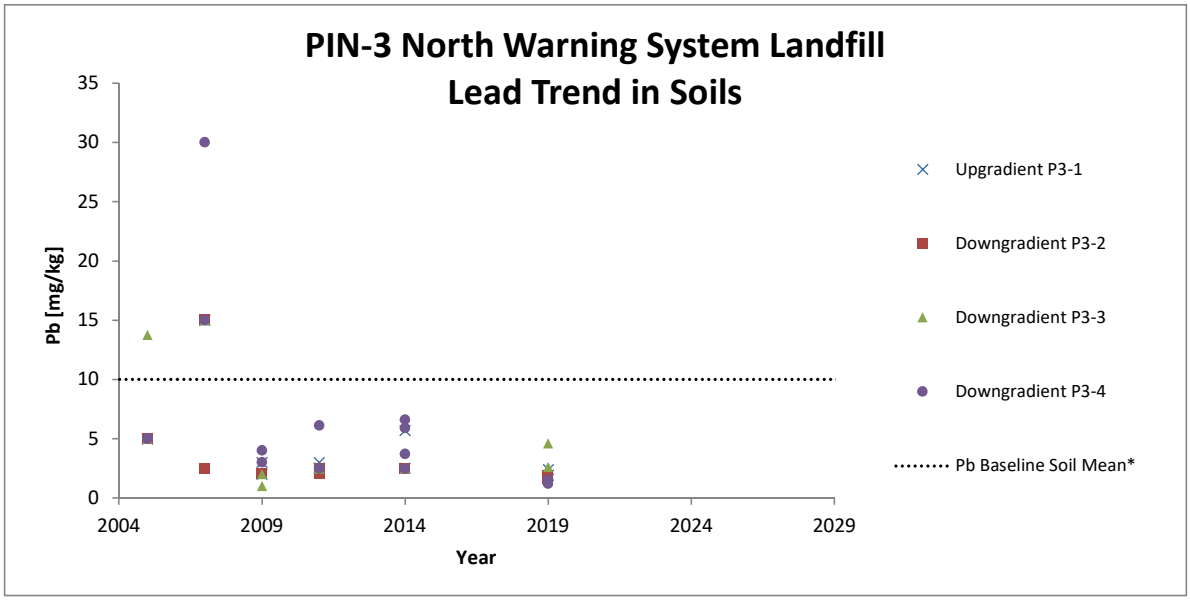
PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





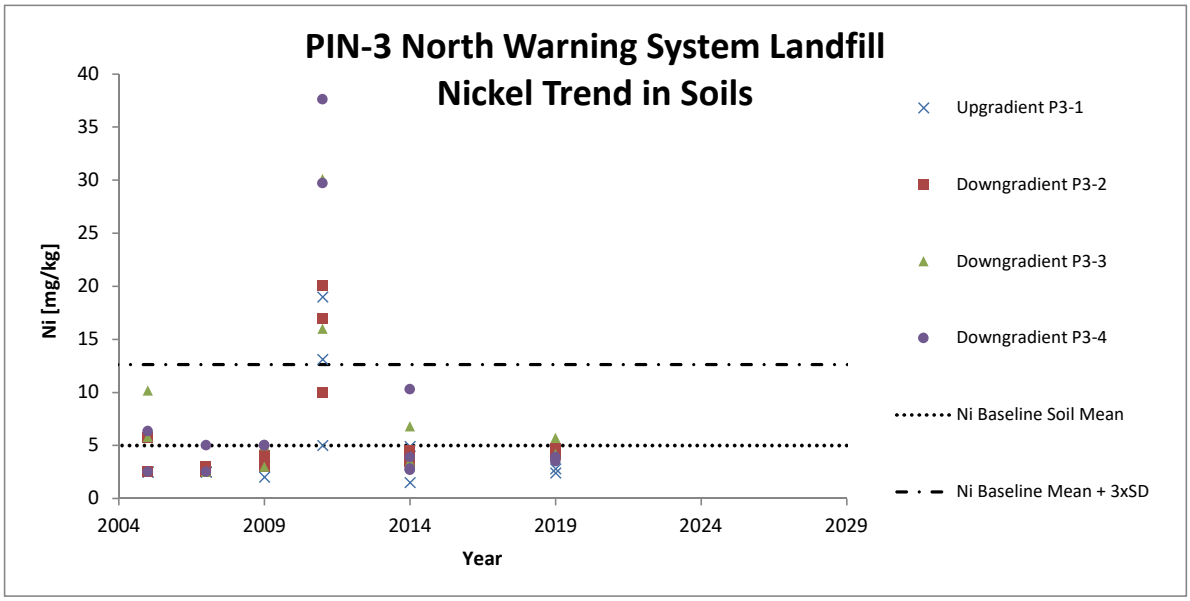
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

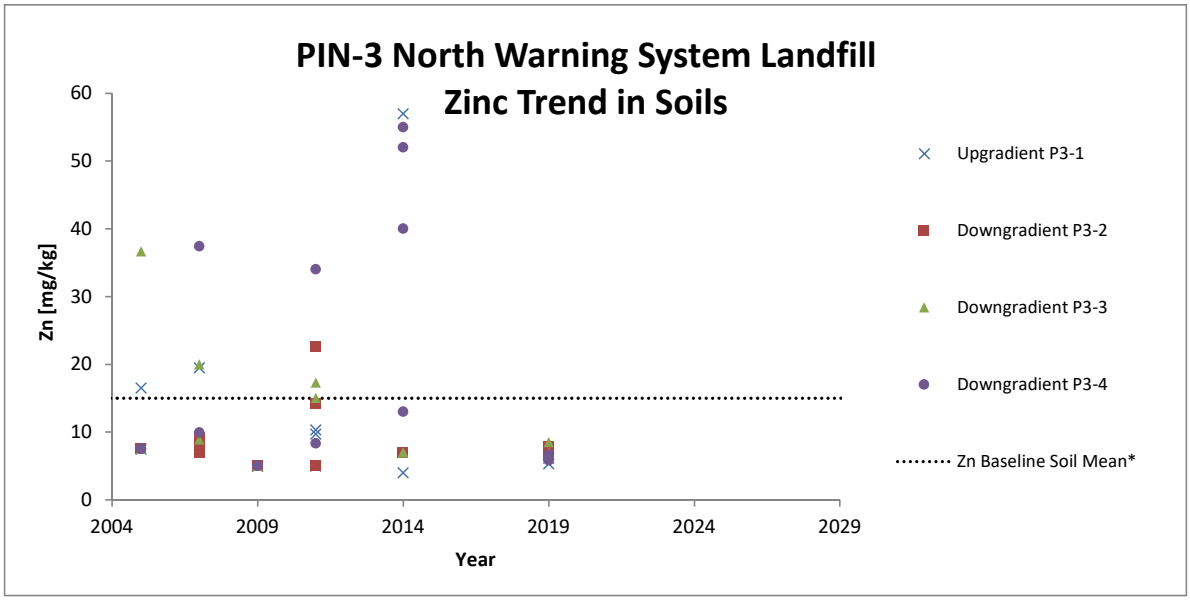
PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Zn baseline arithmetic mean is equal to the baseline detection limit

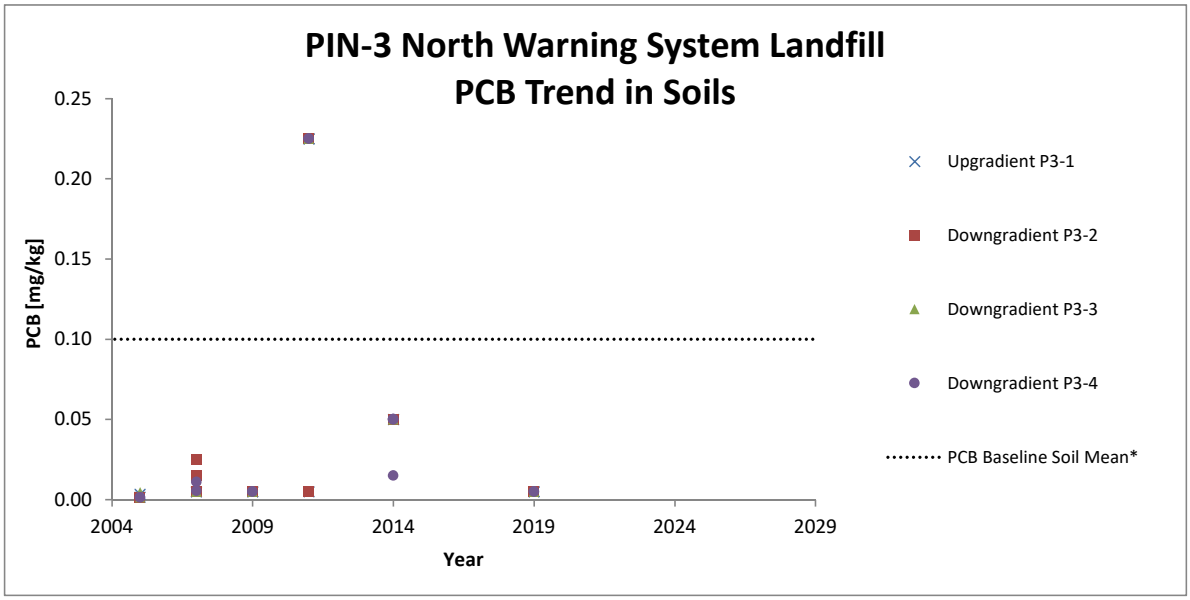
* Zn baseline standard deviation = 0

PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

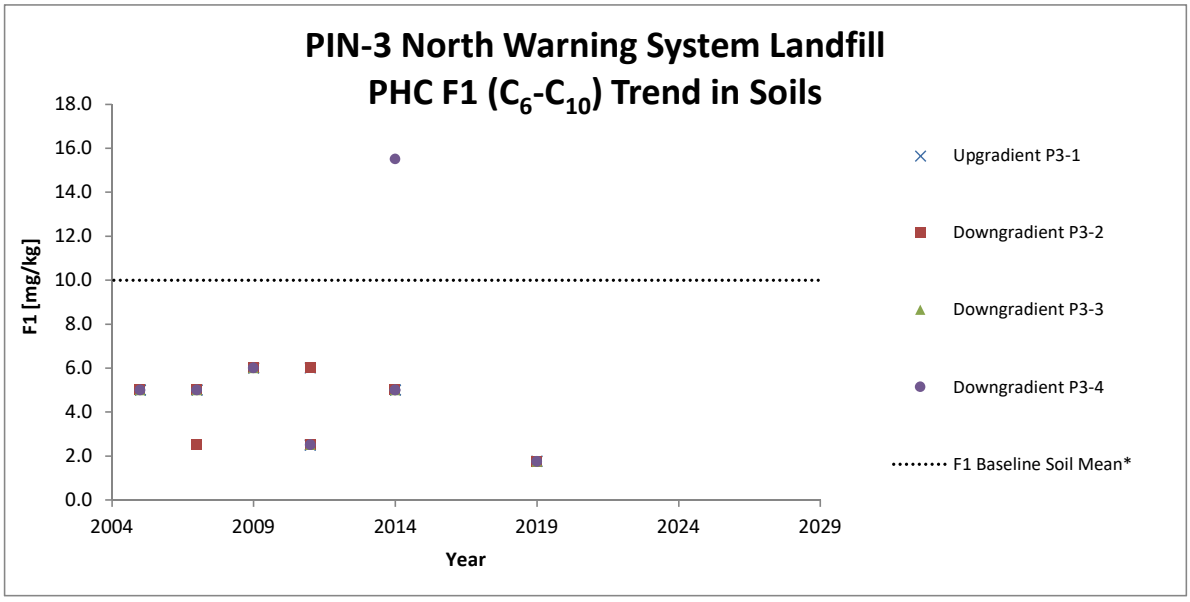
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



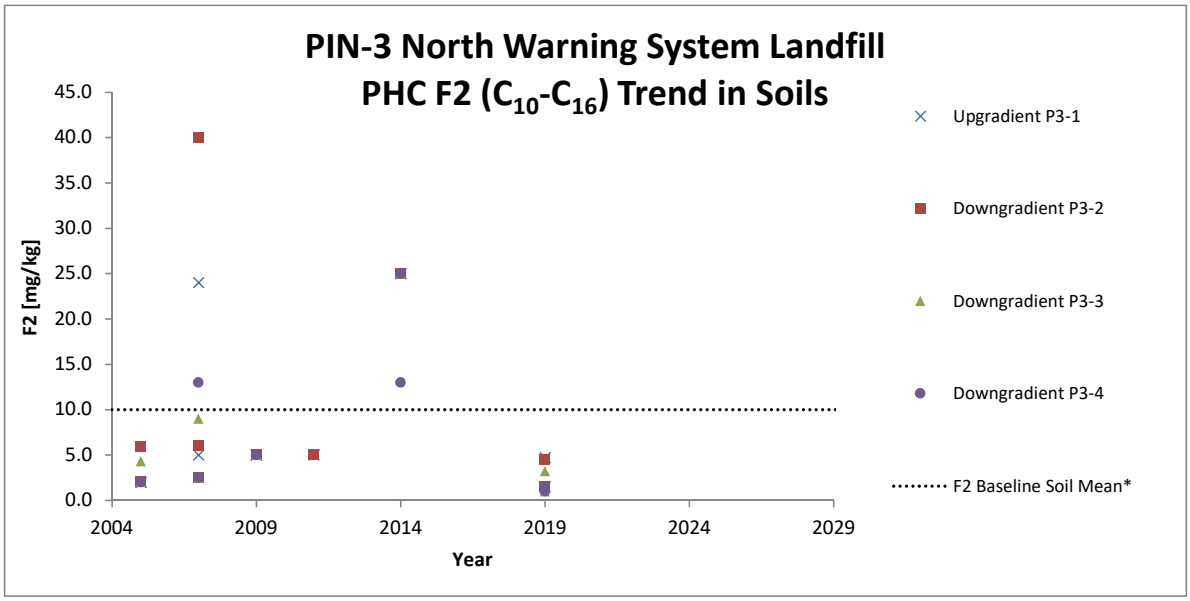
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

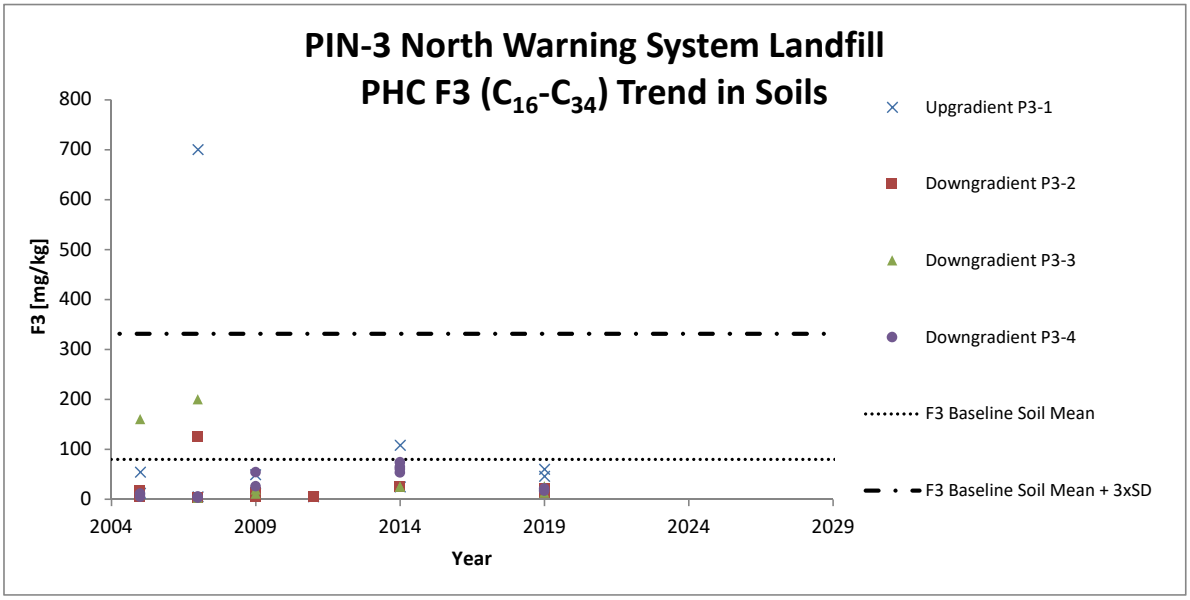
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

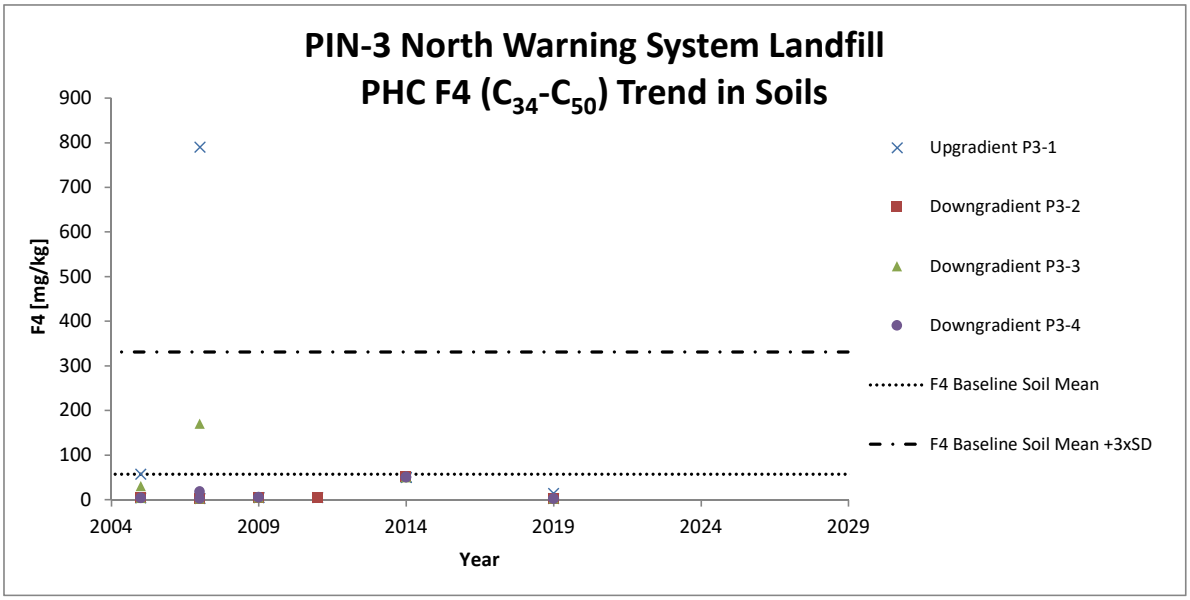


PIN-3 NWS Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



APPENDIX G3

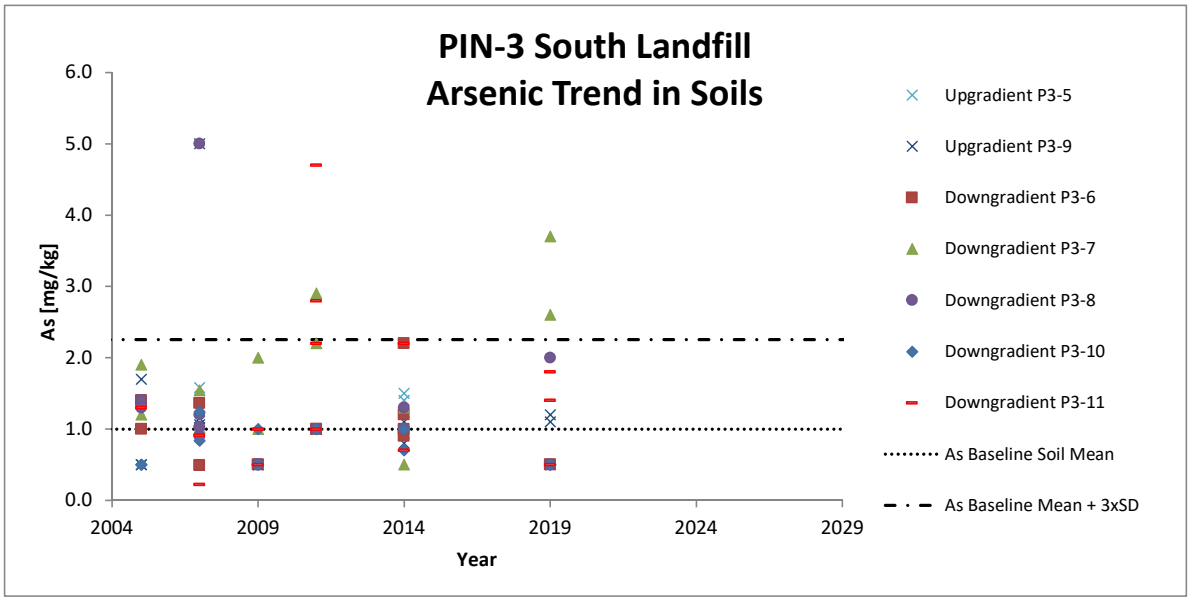
PIN-3 South Landfill – Trends in Soil Inorganics, PCBs and PHCs

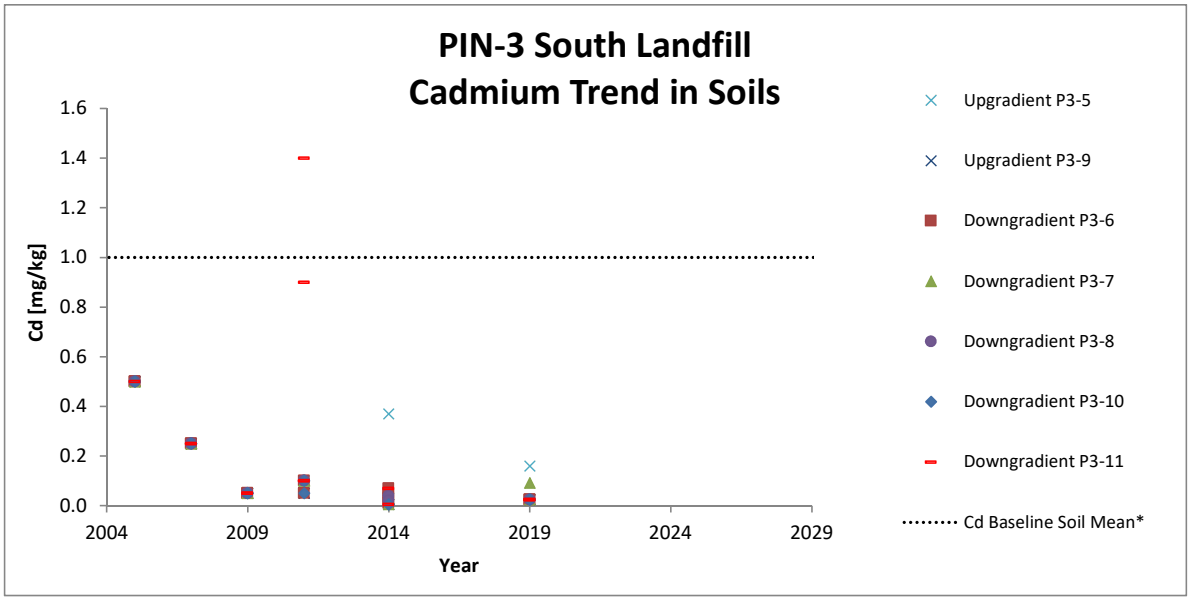
PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





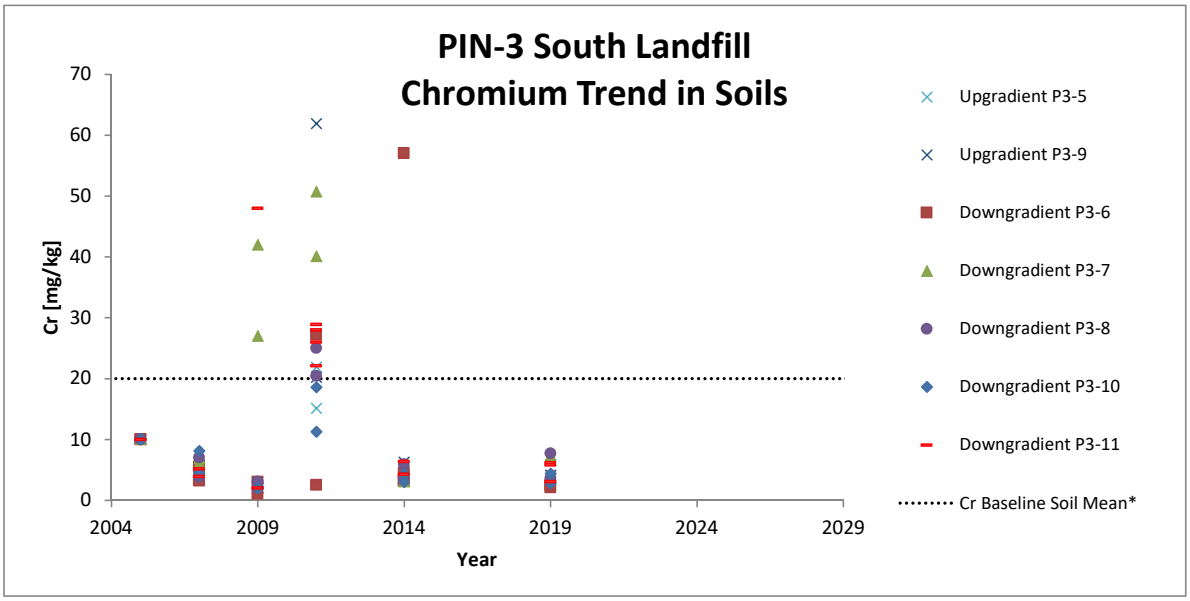
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

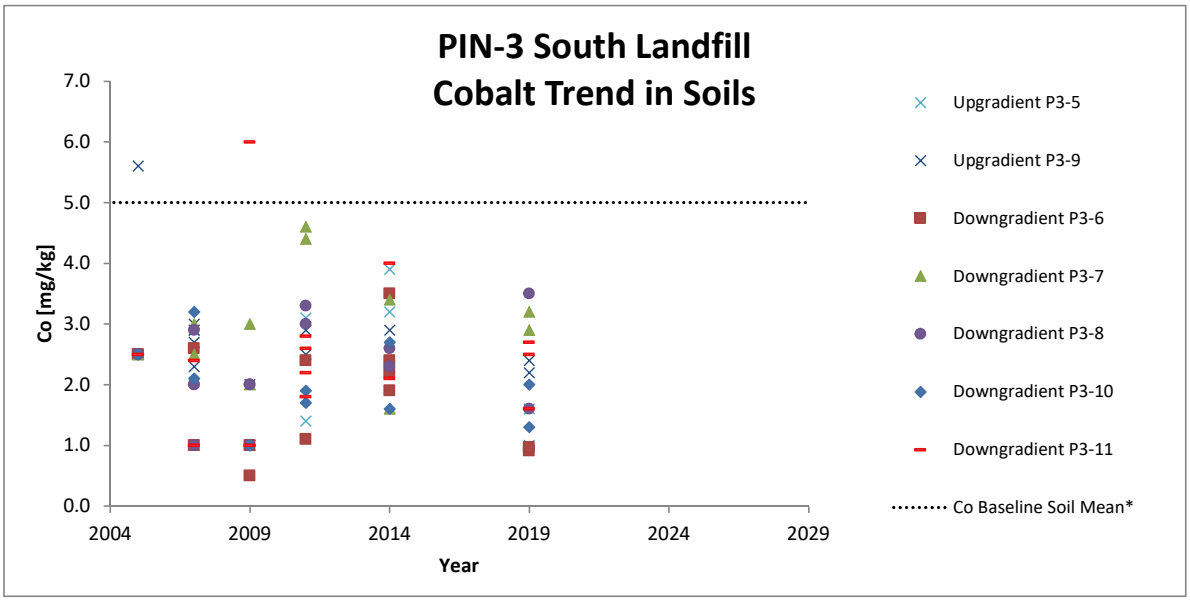
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



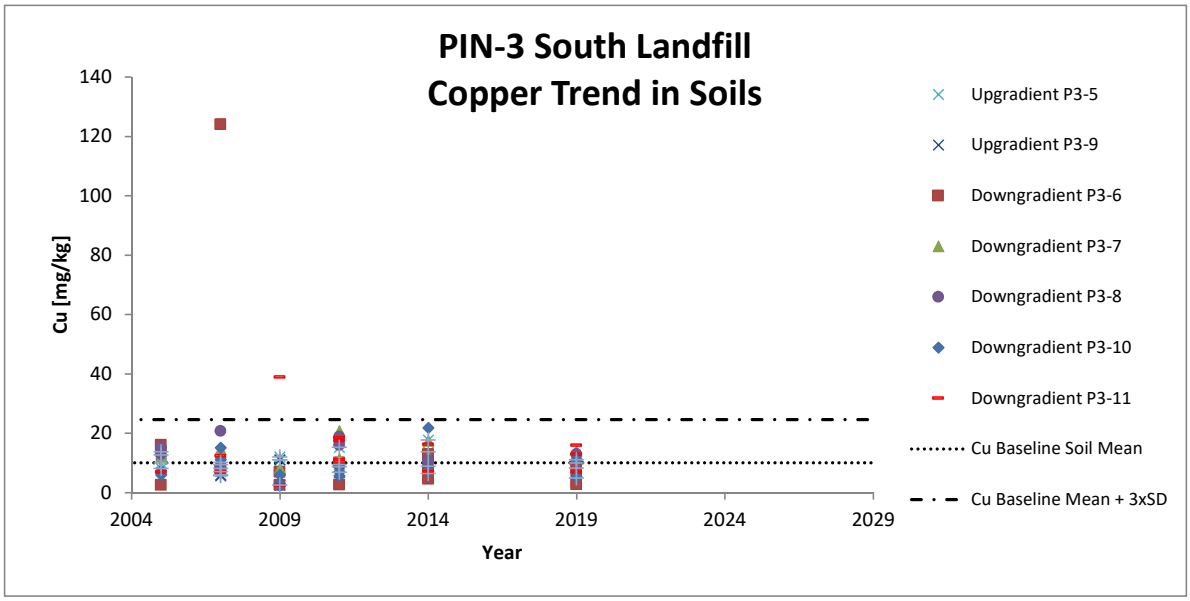
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

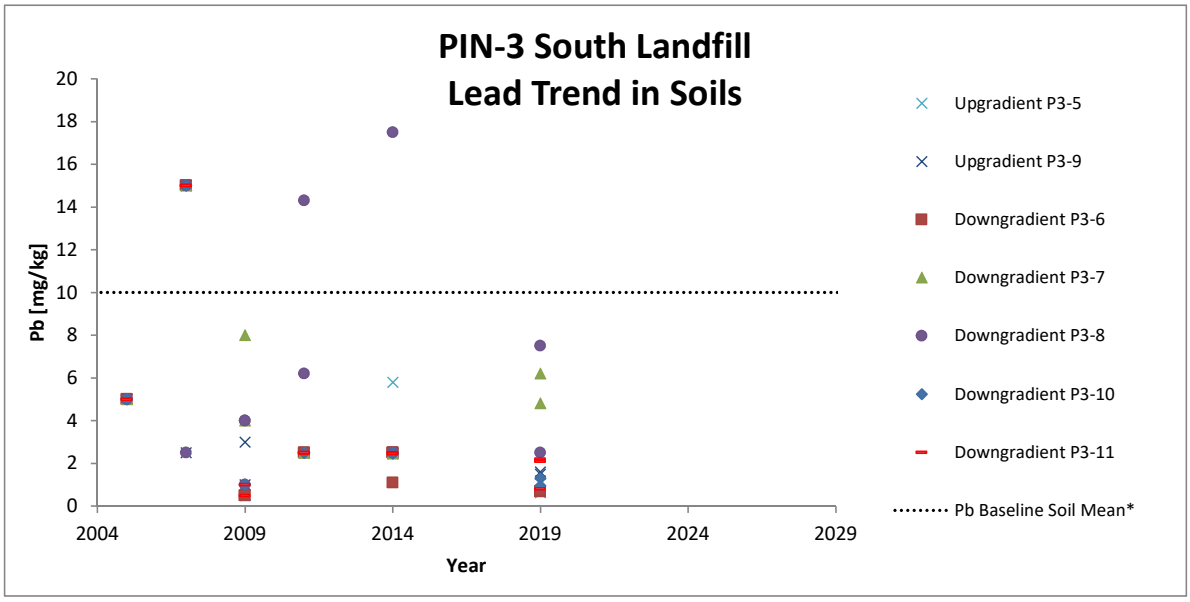
PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Pb baseline arithmetic mean is equal to the baseline detection limit

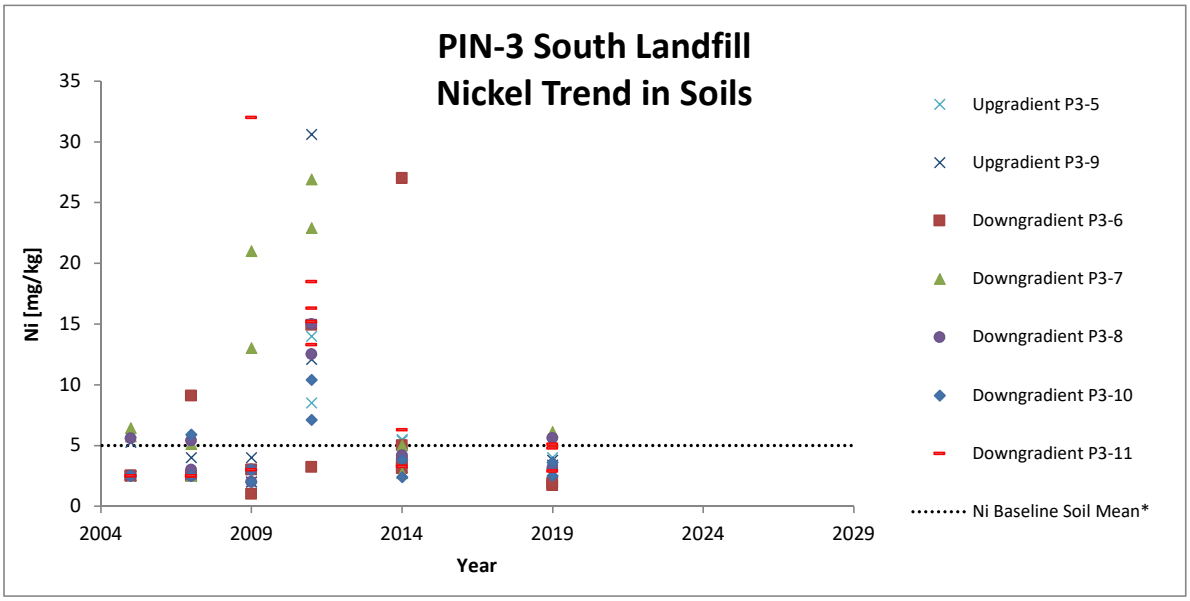
* Pb baseline standard deviation = 0

PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

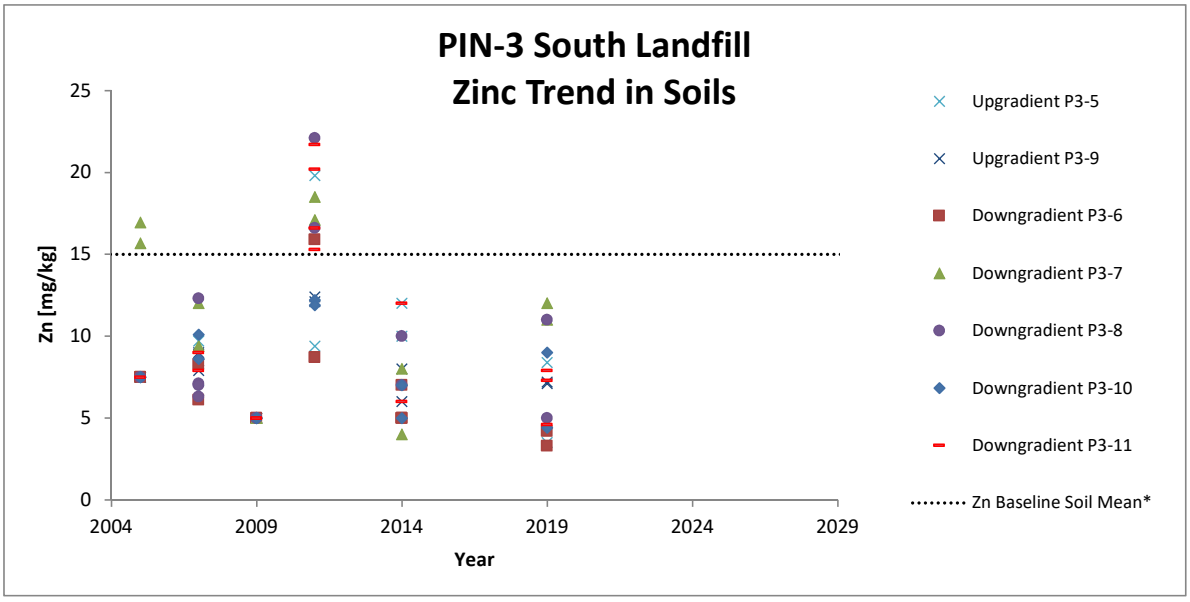
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0



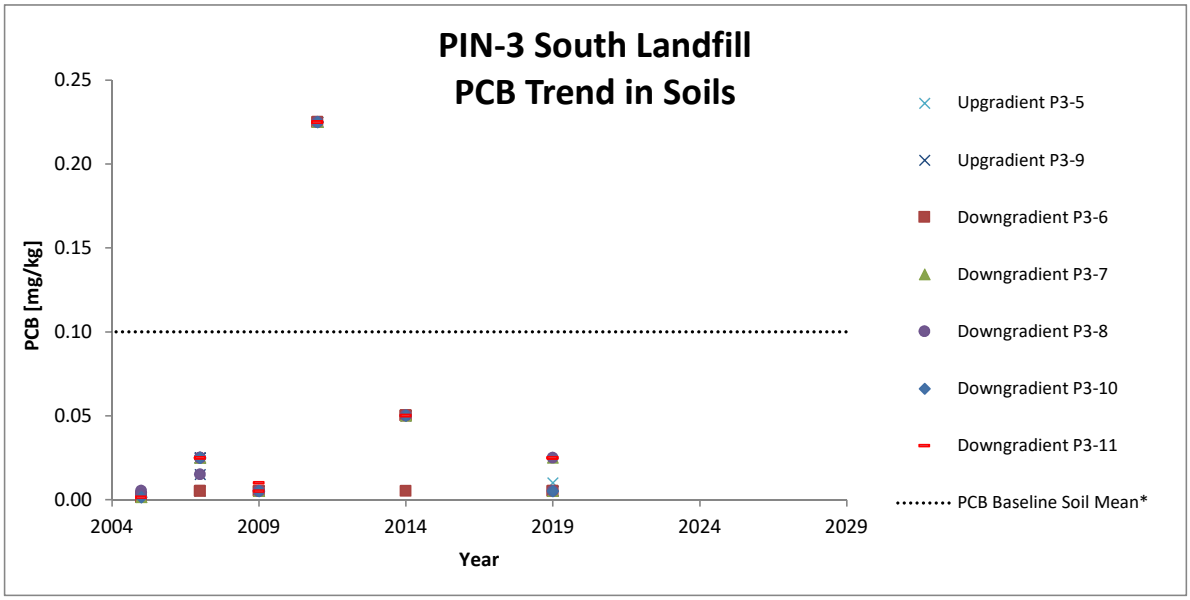
* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

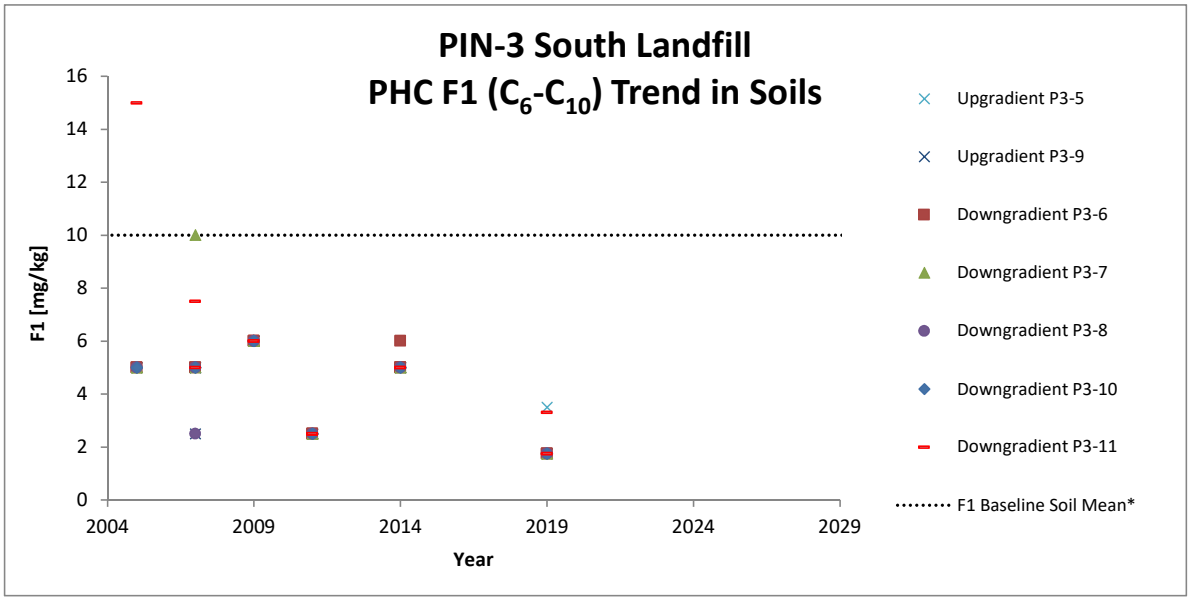
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



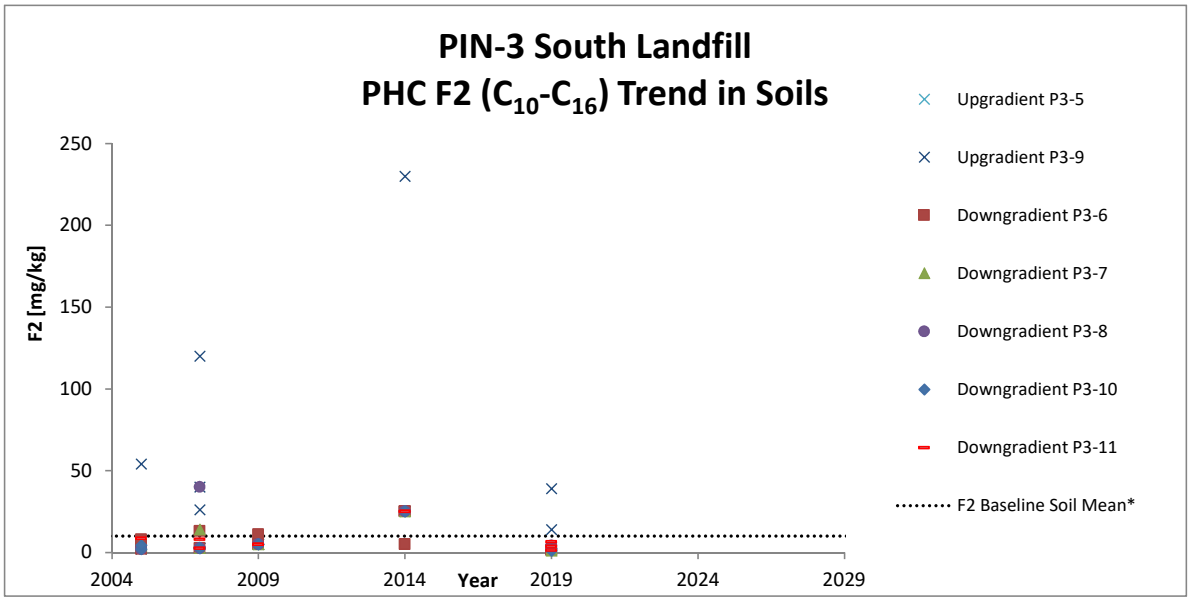
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

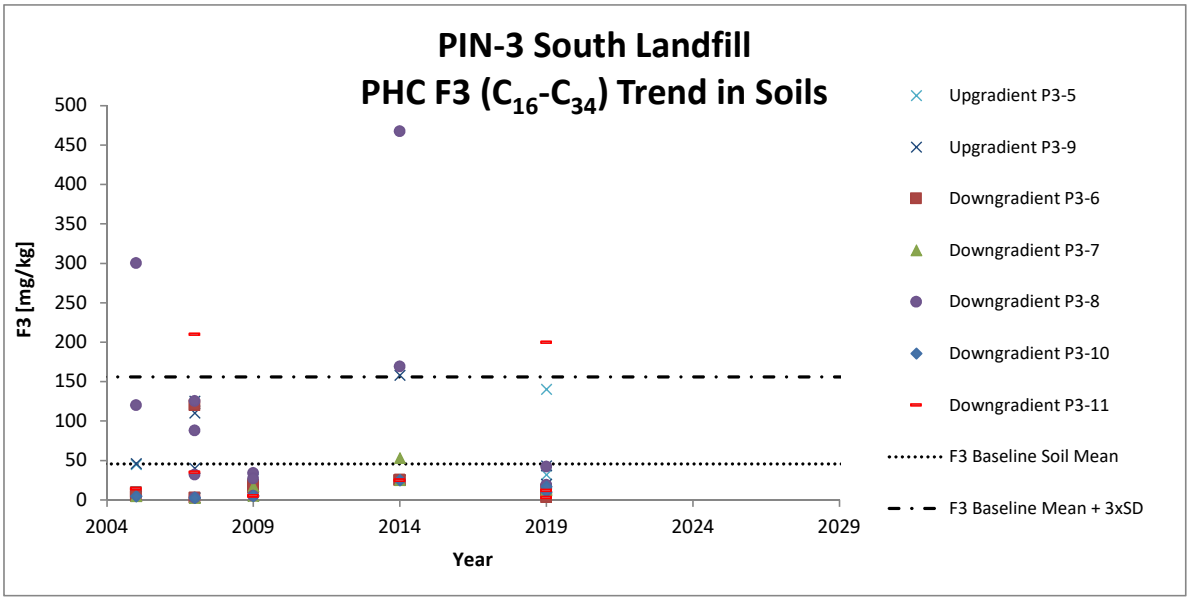
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

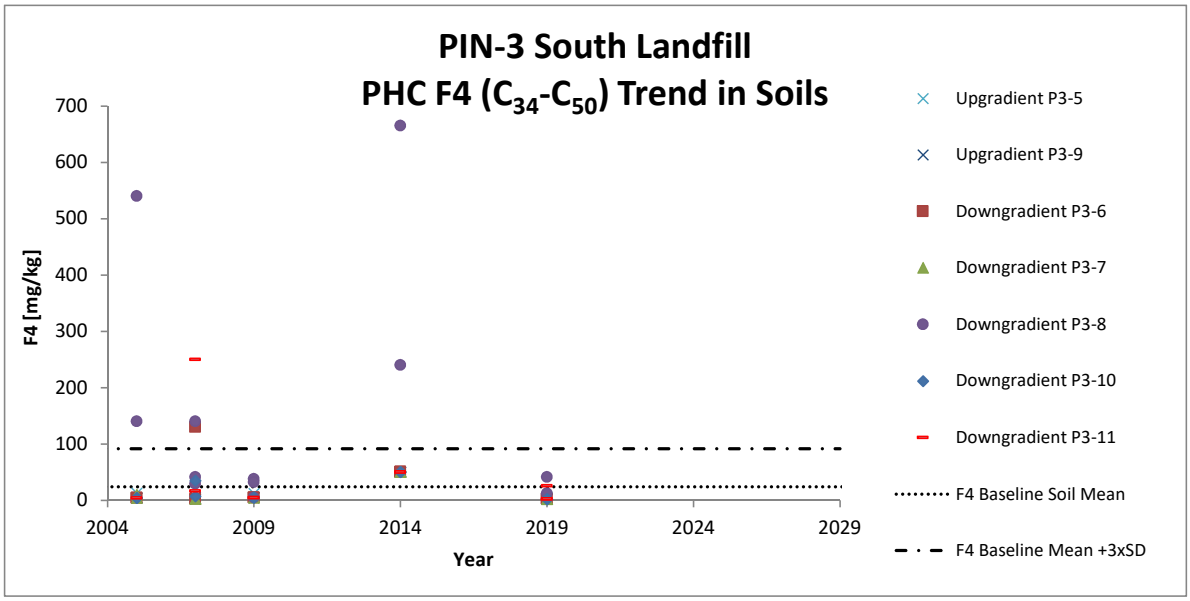


PIN-3 South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



APPENDIX G4

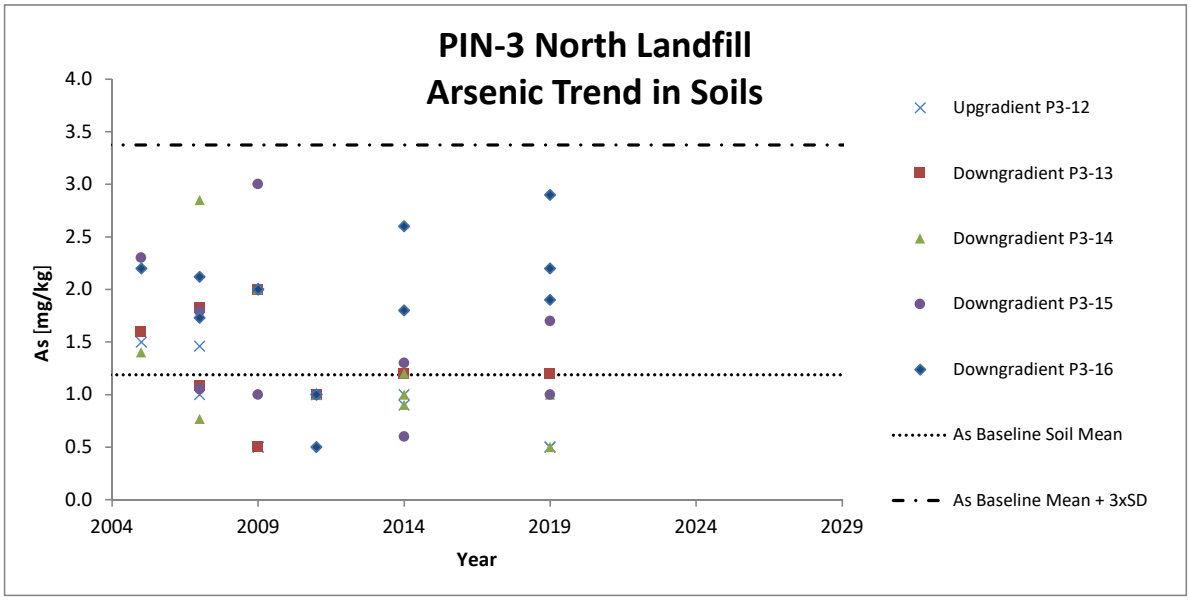
PIN-3 North Landfill – Trends in Soil Inorganics, PCBs and PHCs

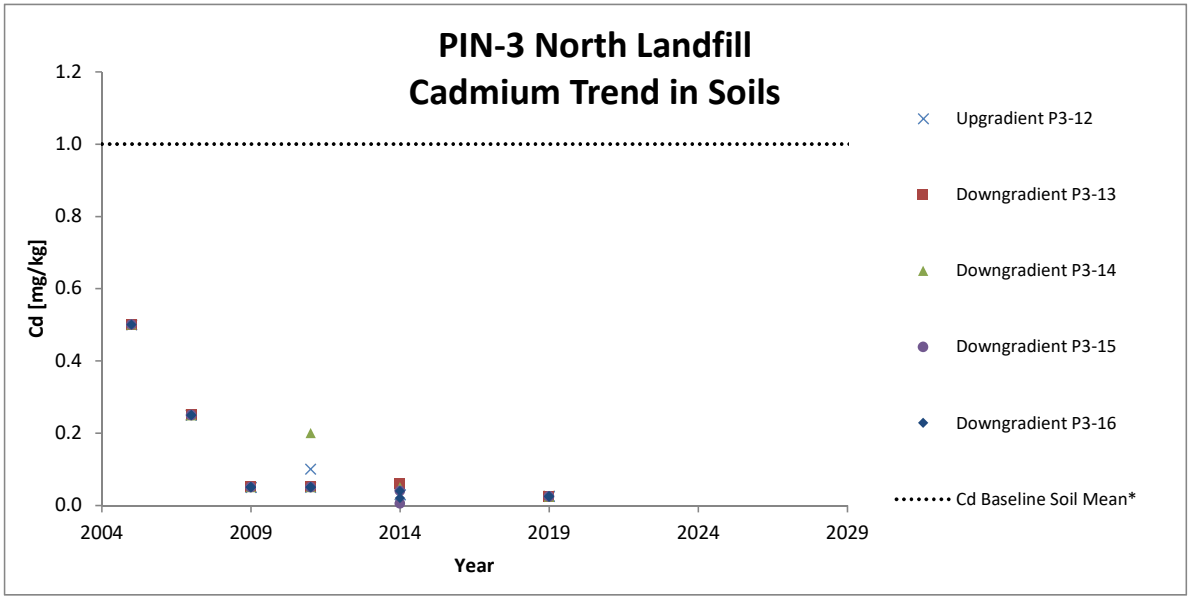
PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Cd baseline arithmetic mean is equal to the baseline detection limit

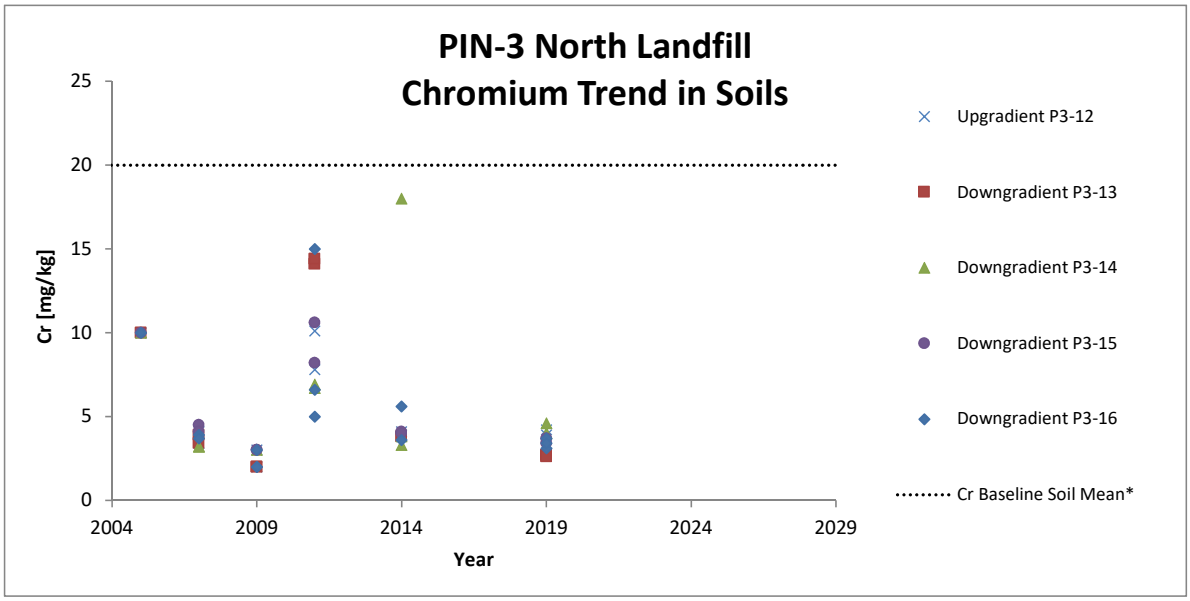
* Cd baseline standard deviation = 0

PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

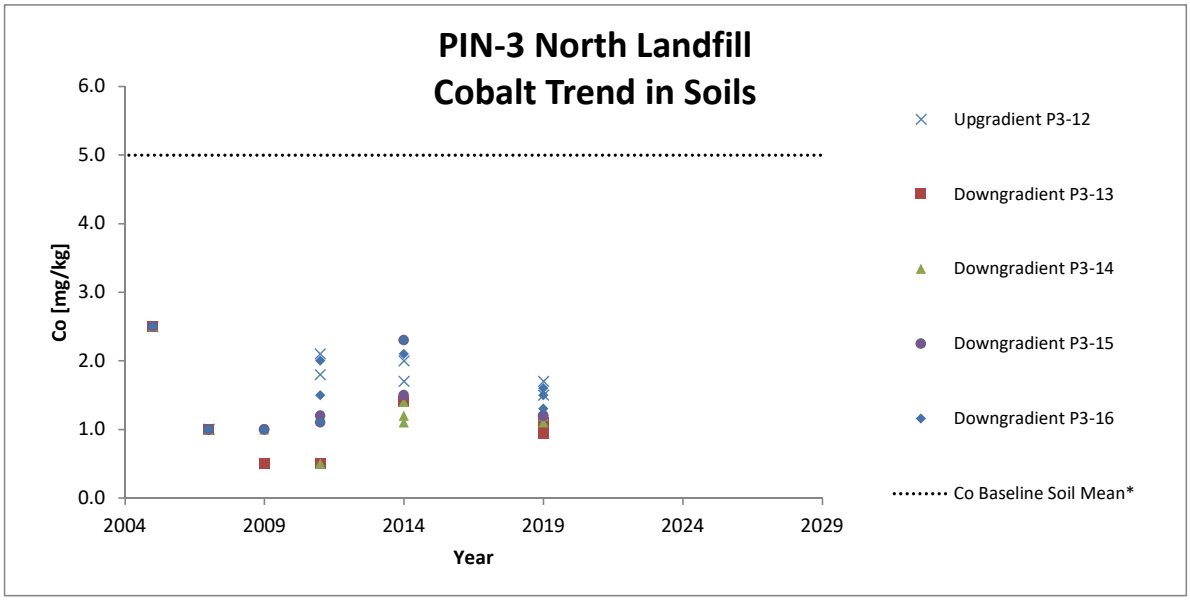
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



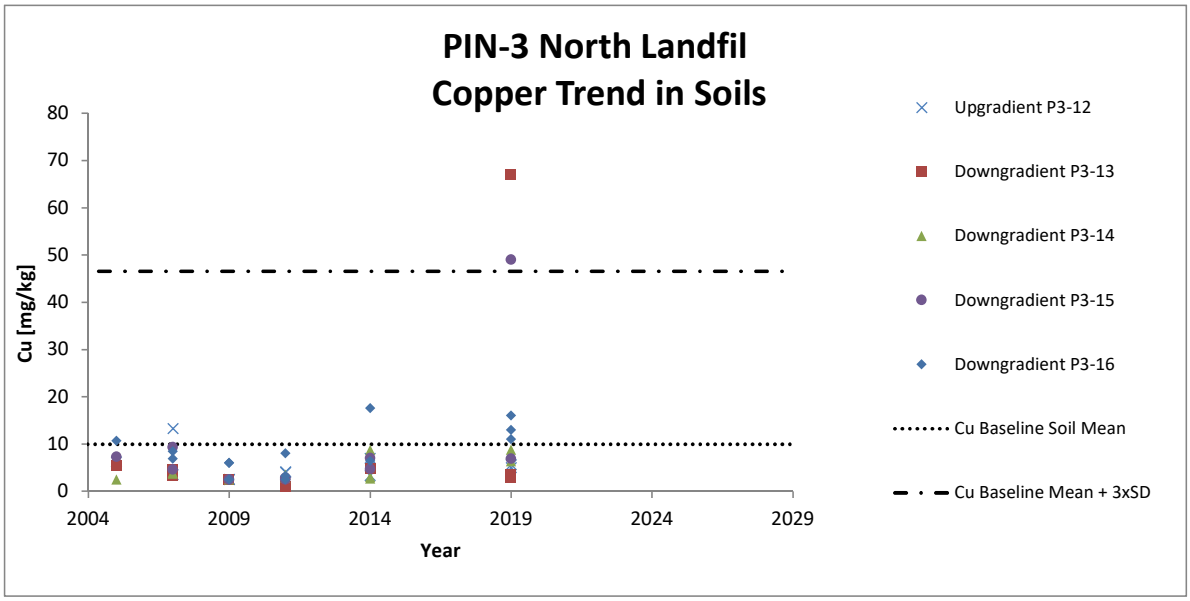
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

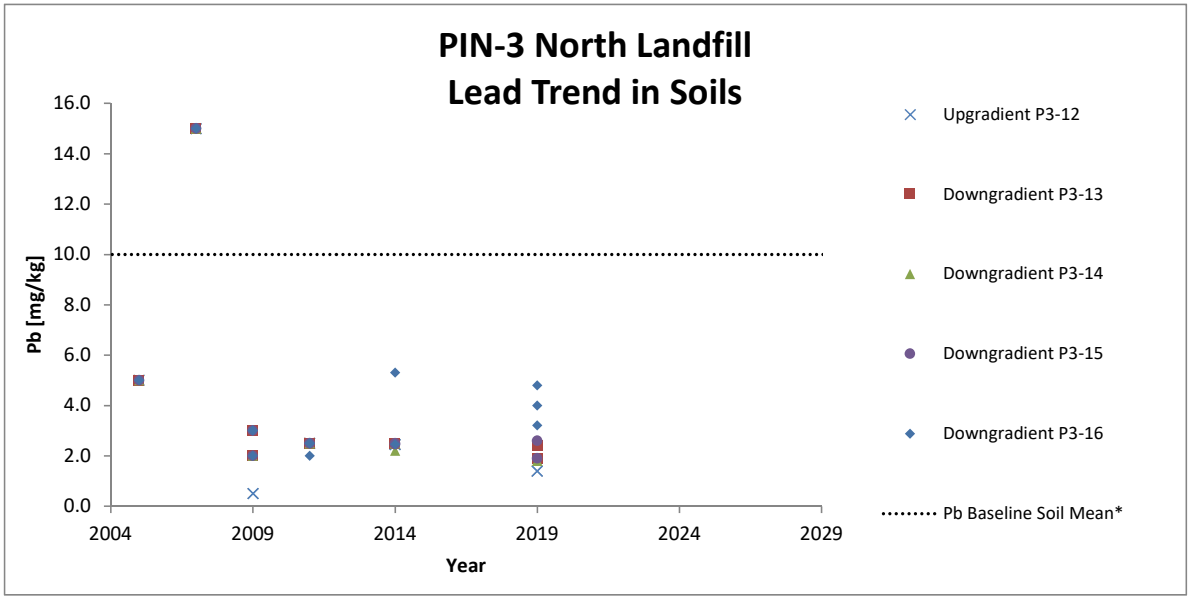
PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Pb baseline arithmetic mean is equal to the baseline detection limit

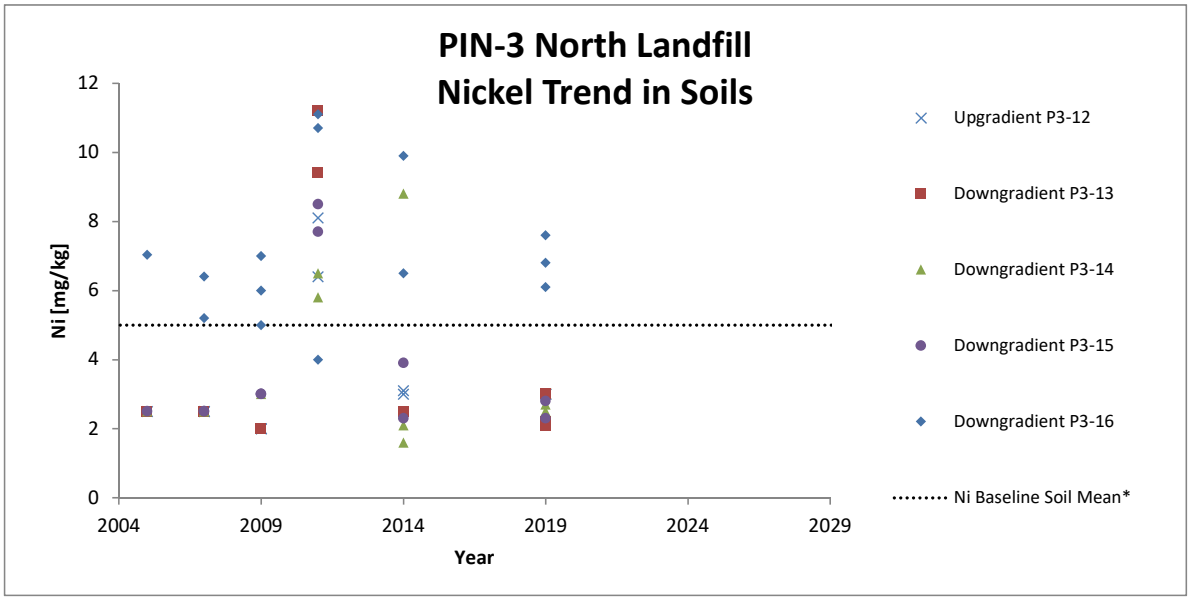
* Pb baseline standard deviation = 0

PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

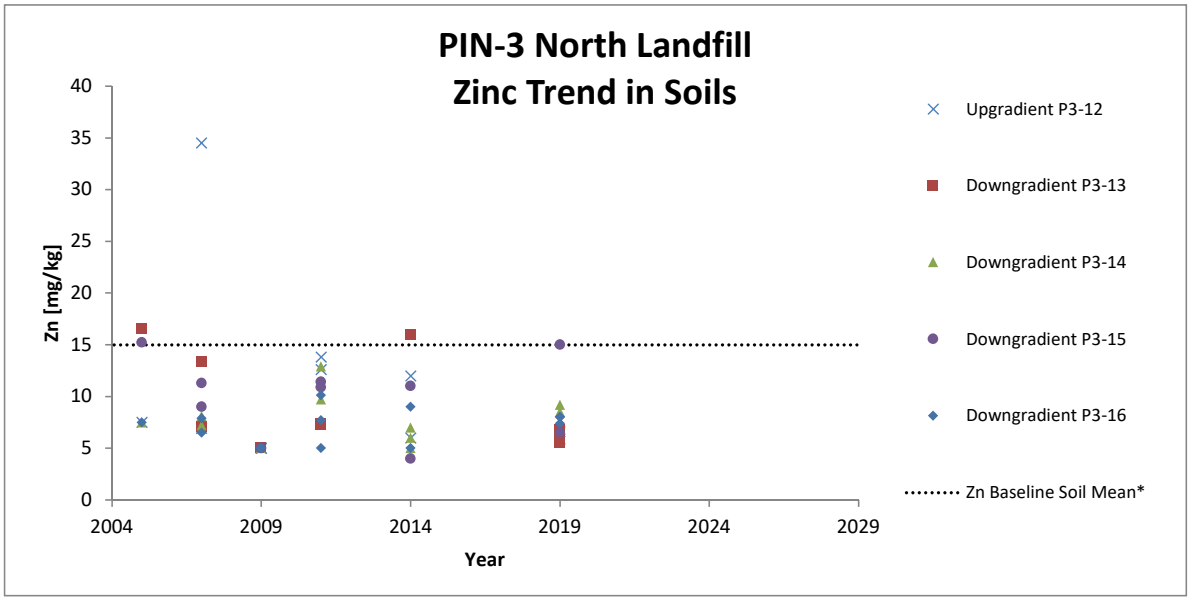
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0



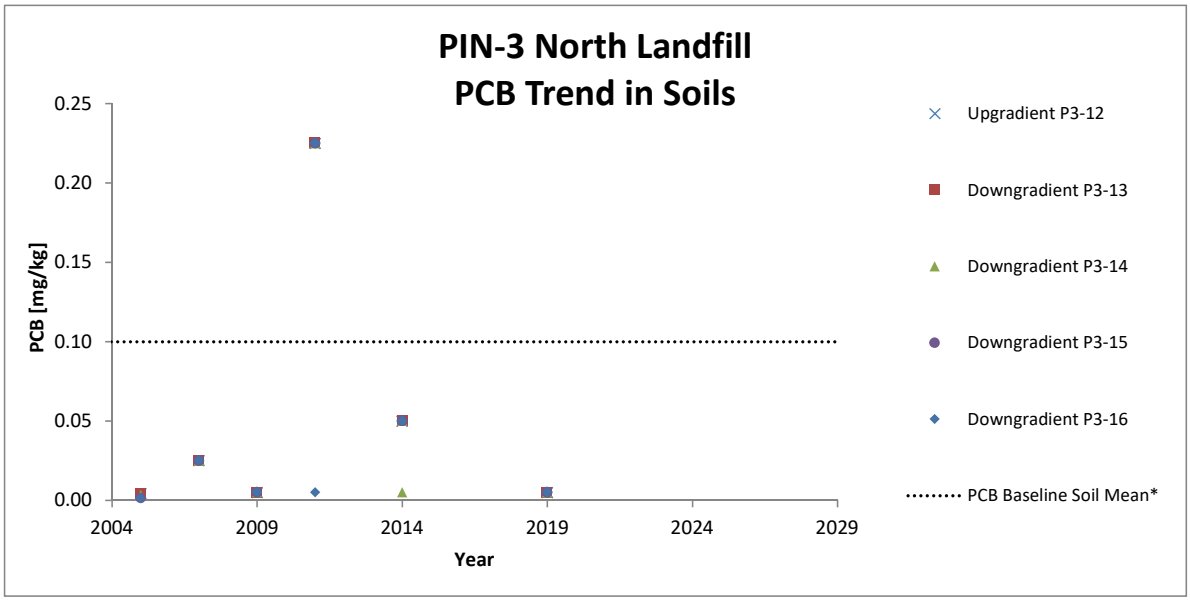
* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

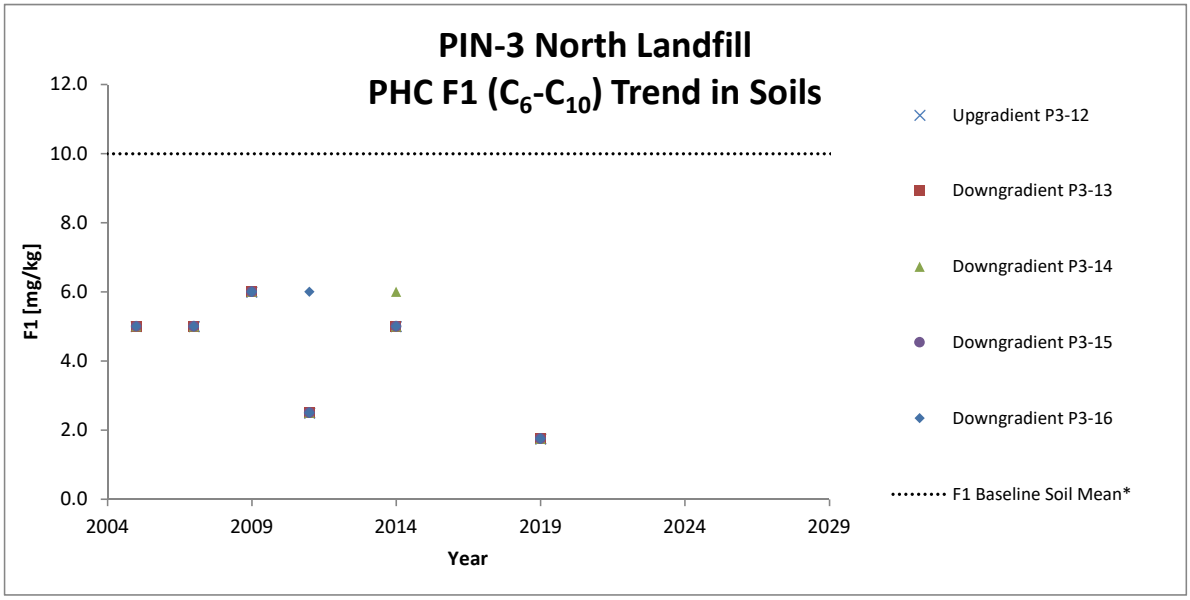
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



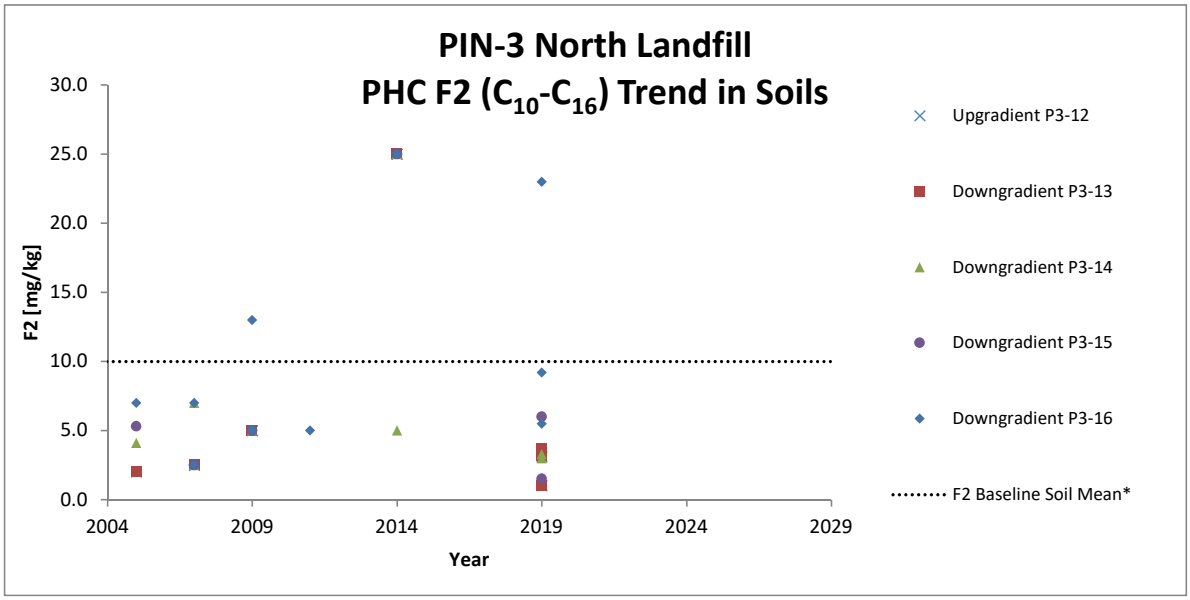
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

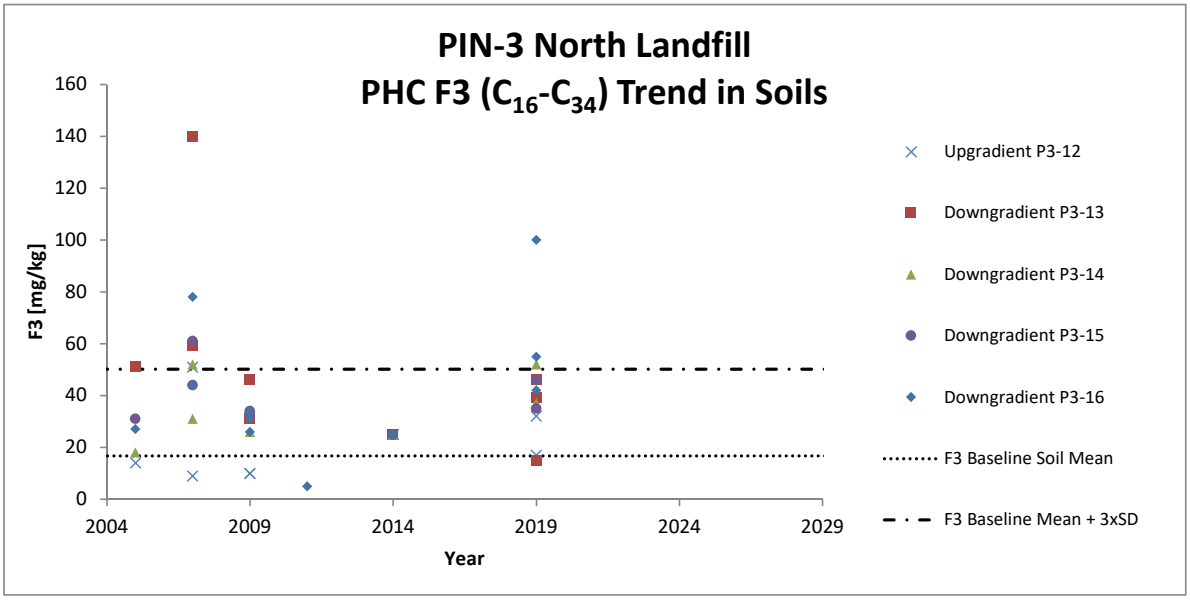
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

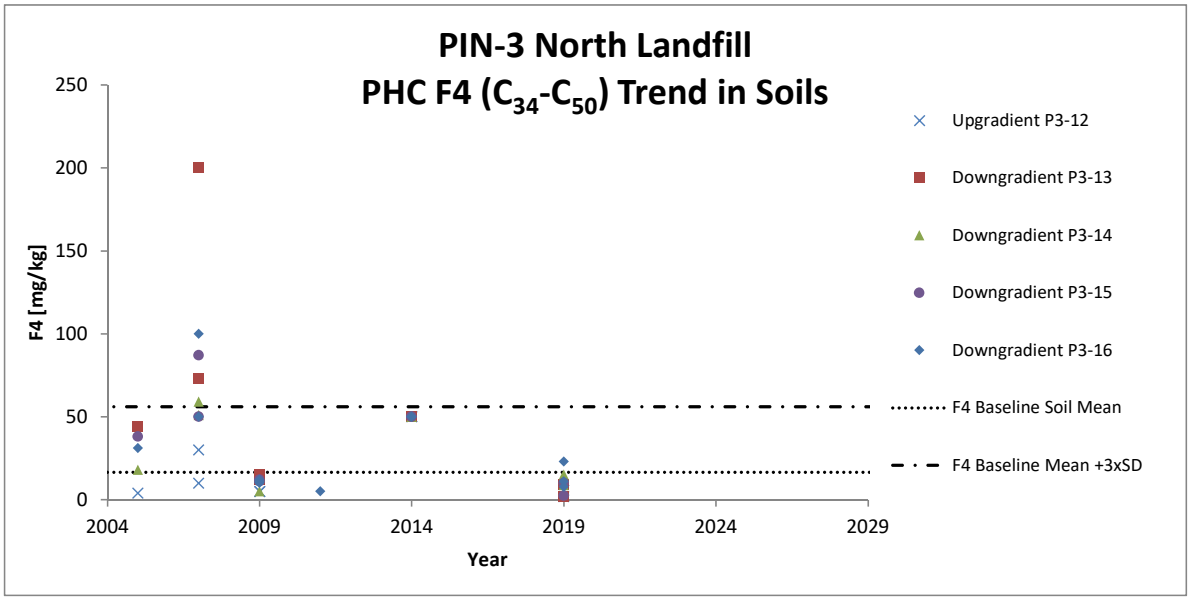


PIN-3 North Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



APPENDIX G5

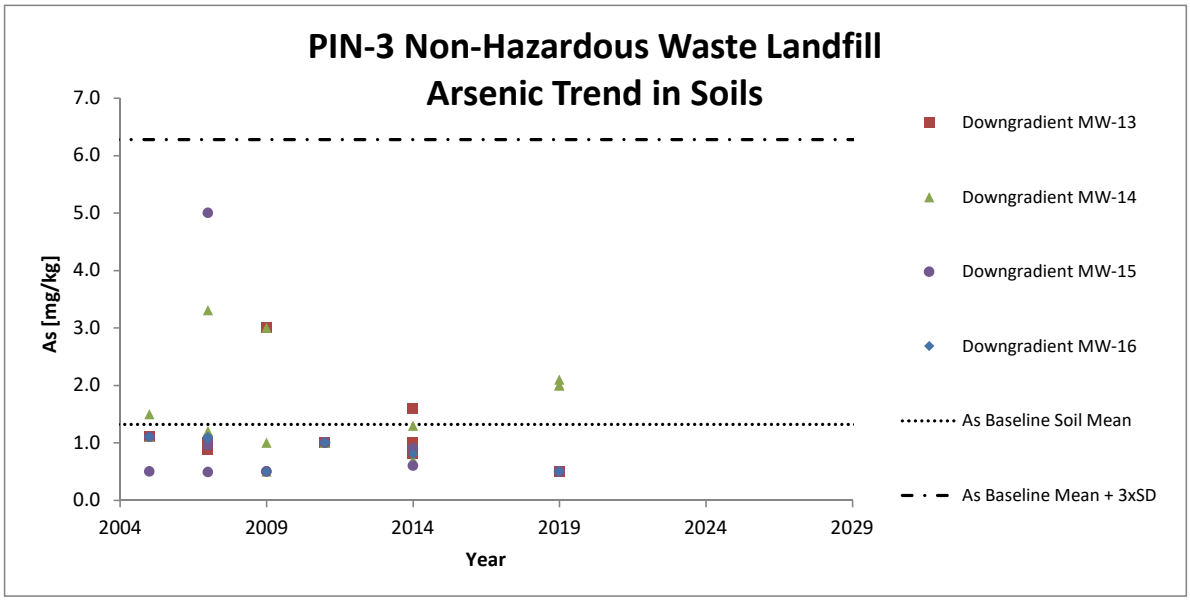
PIN-3 Non-Hazardous Waste Landfill – Trends in Soil Inorganics, PCBs and PHCs

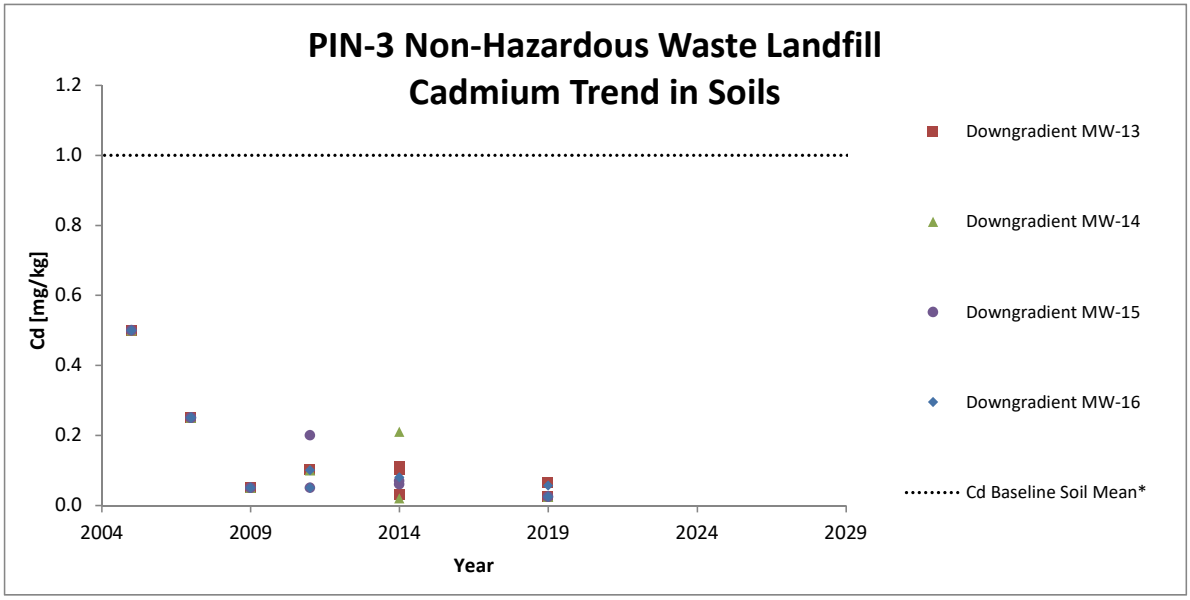
PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Cd baseline arithmetic mean is equal to the baseline detection limit

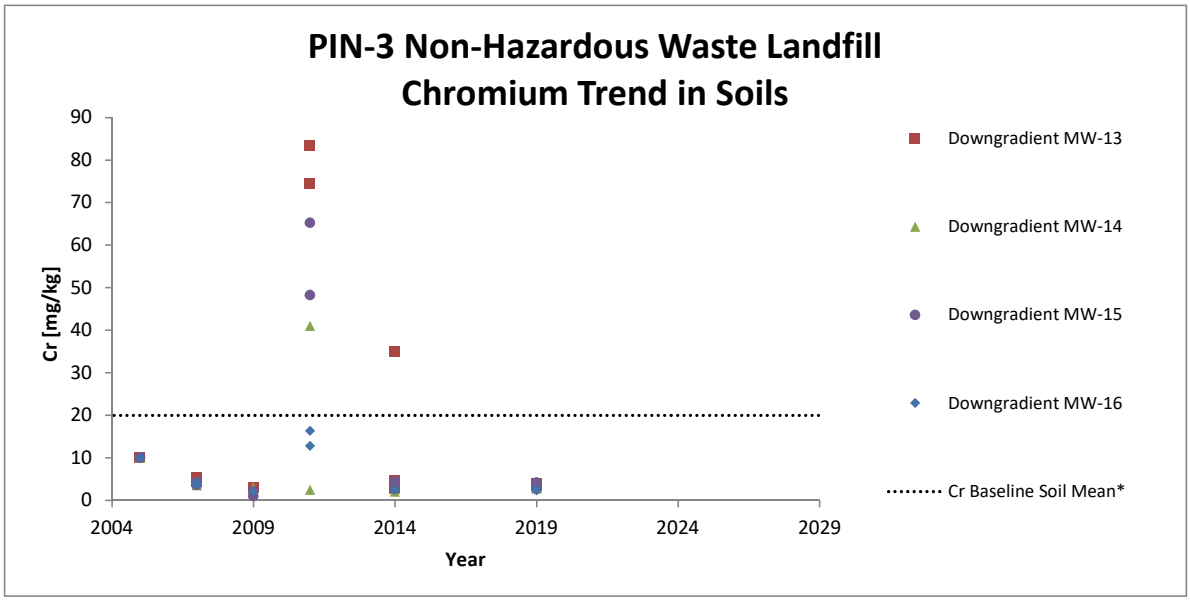
* Cd baseline standard deviation = 0

PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

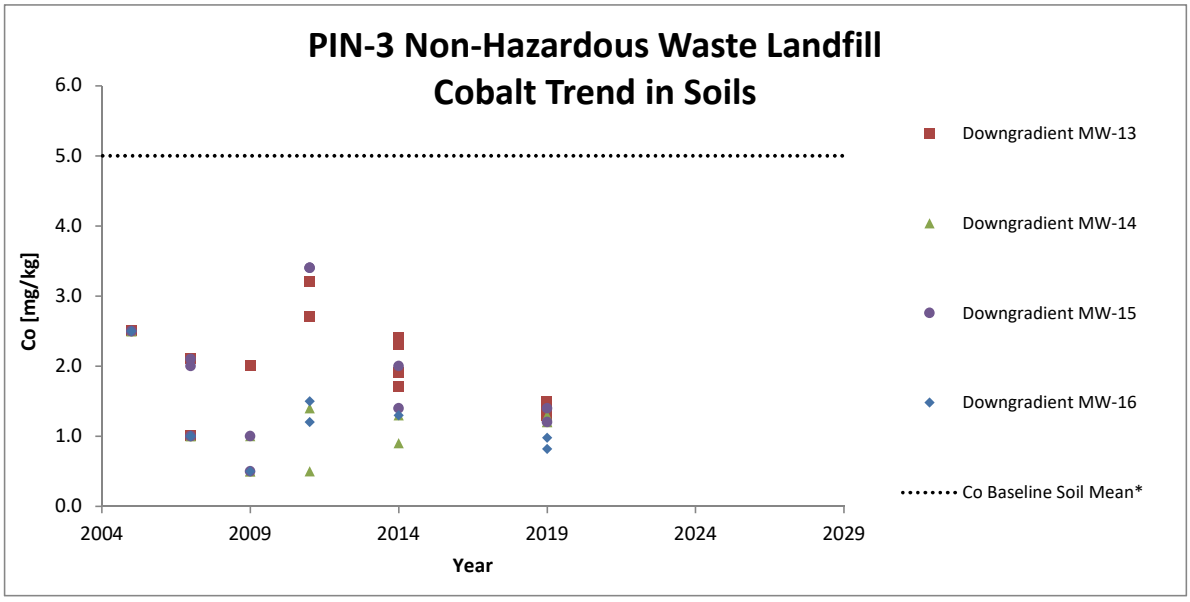
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



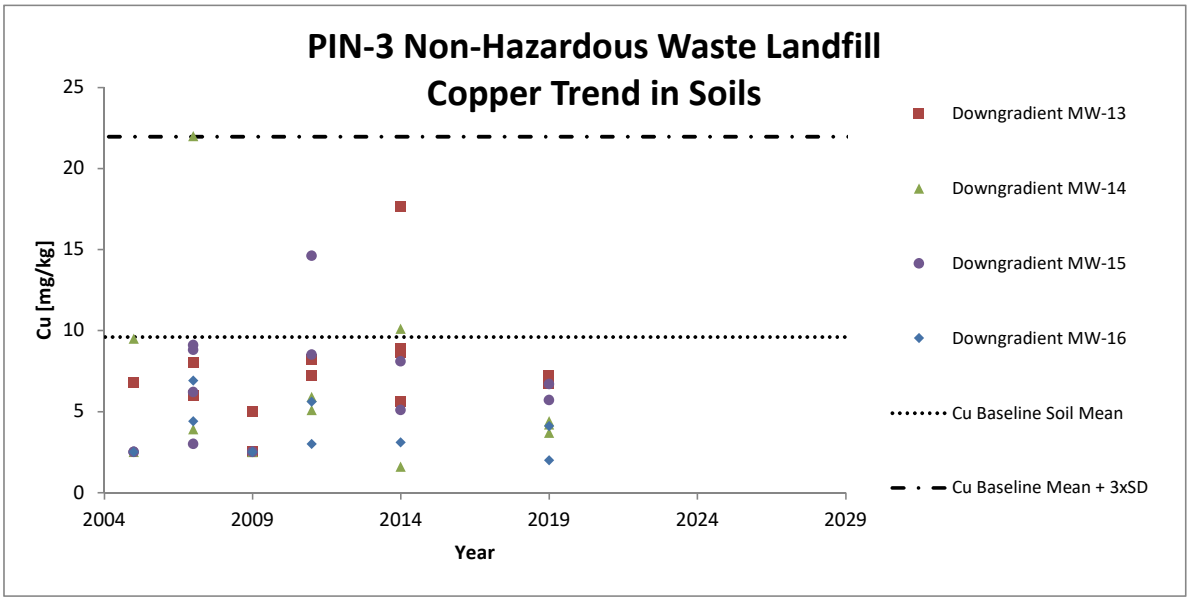
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

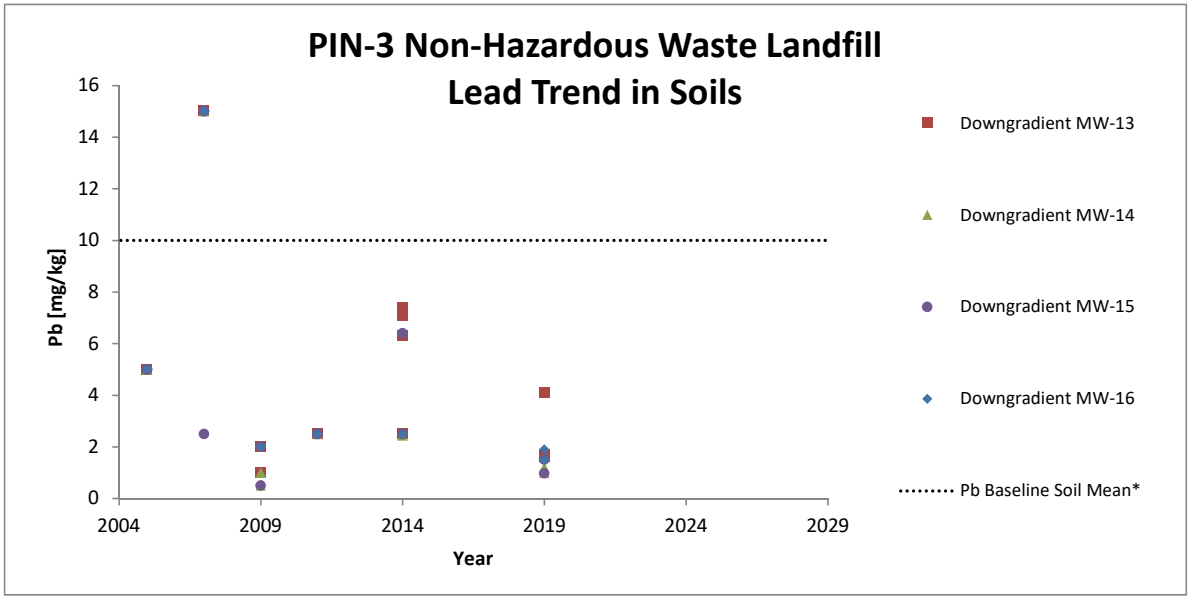
PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Pb baseline arithmetic mean is equal to the baseline detection limit

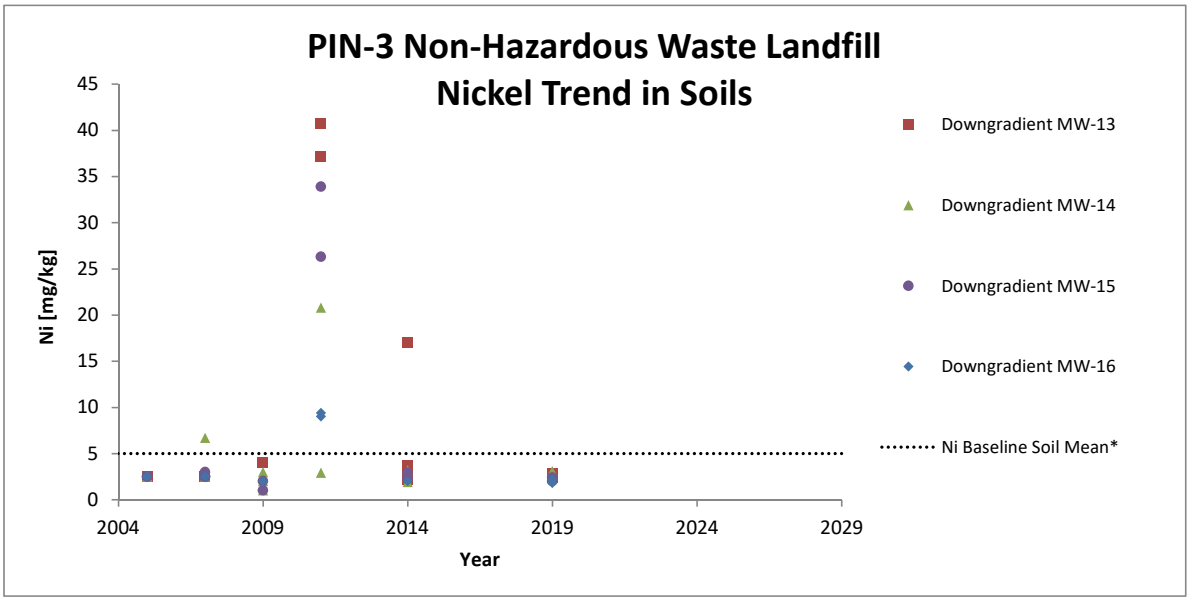
* Pb baseline standard deviation = 0

PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

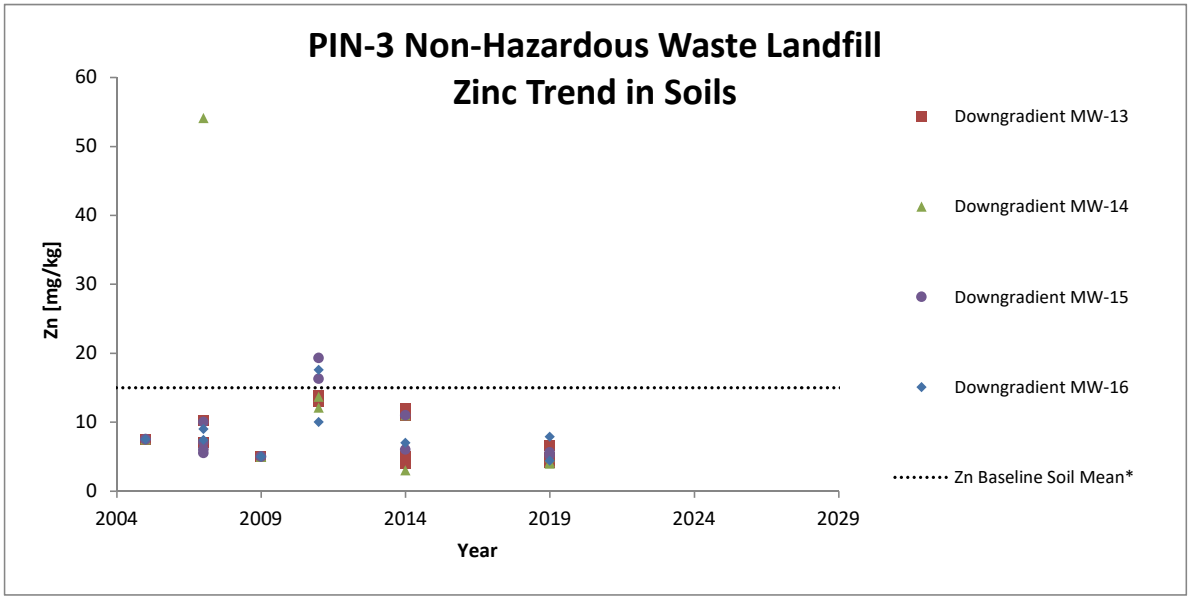
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0



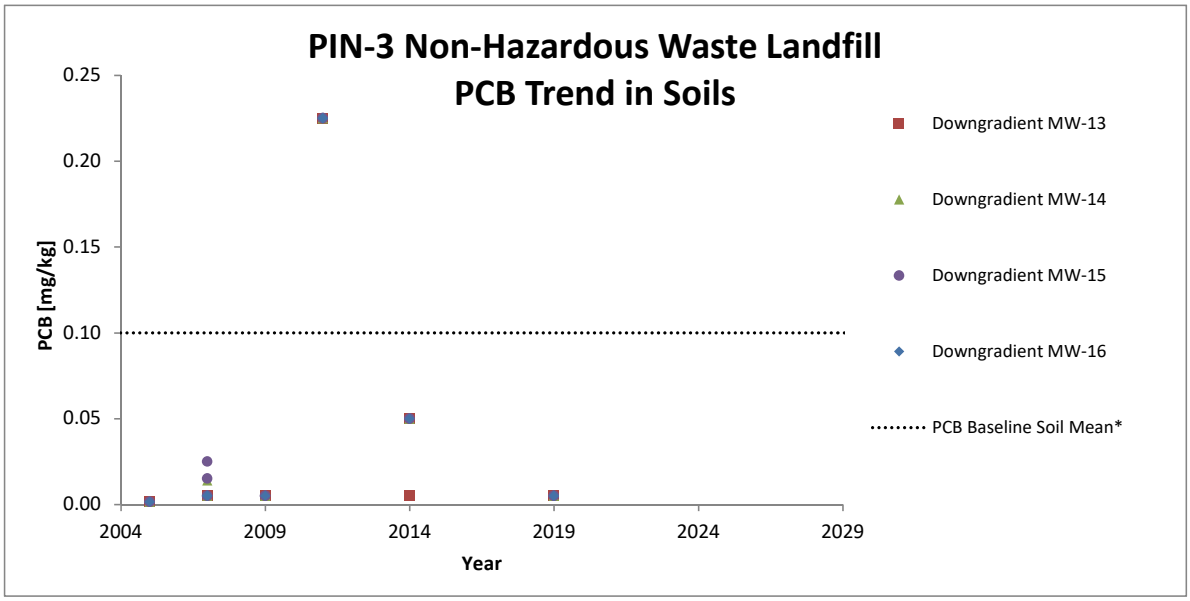
* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

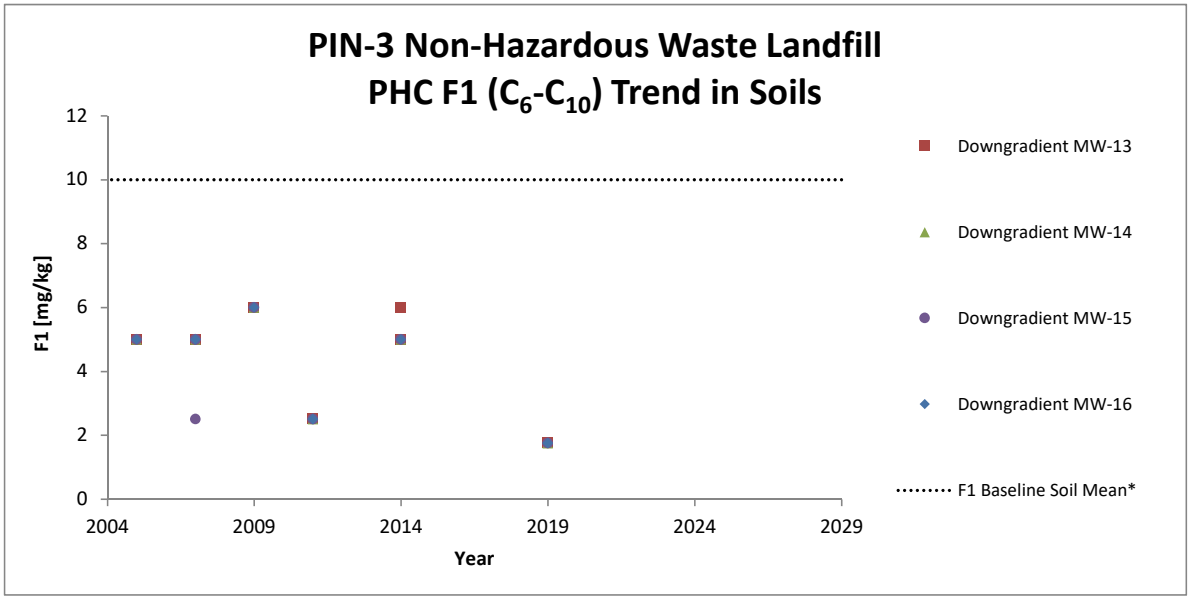
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



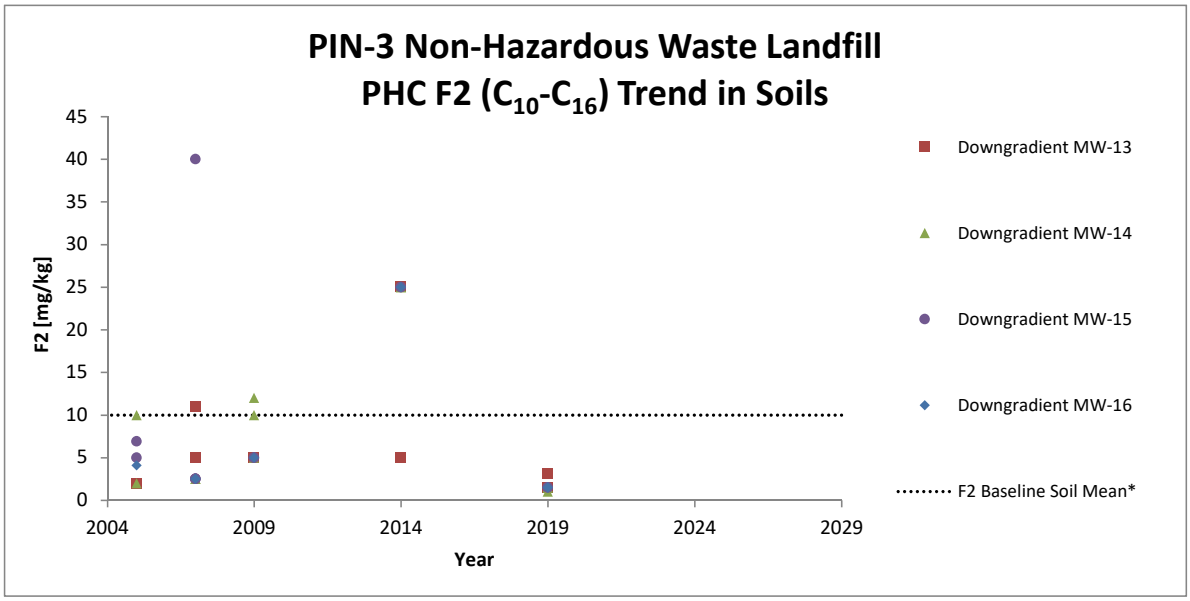
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

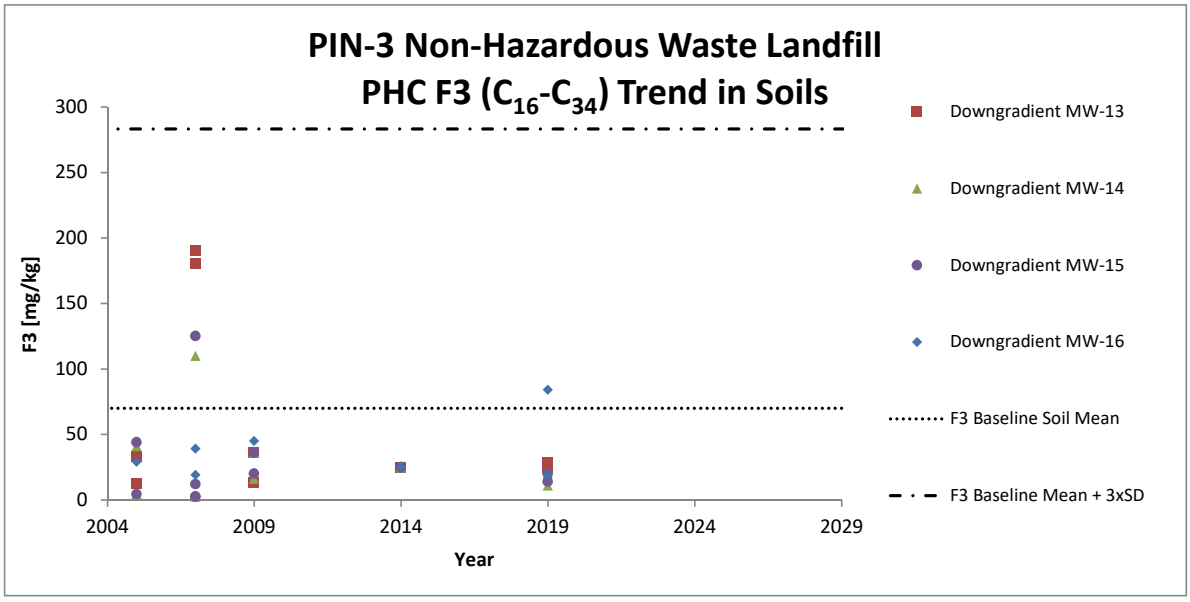
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

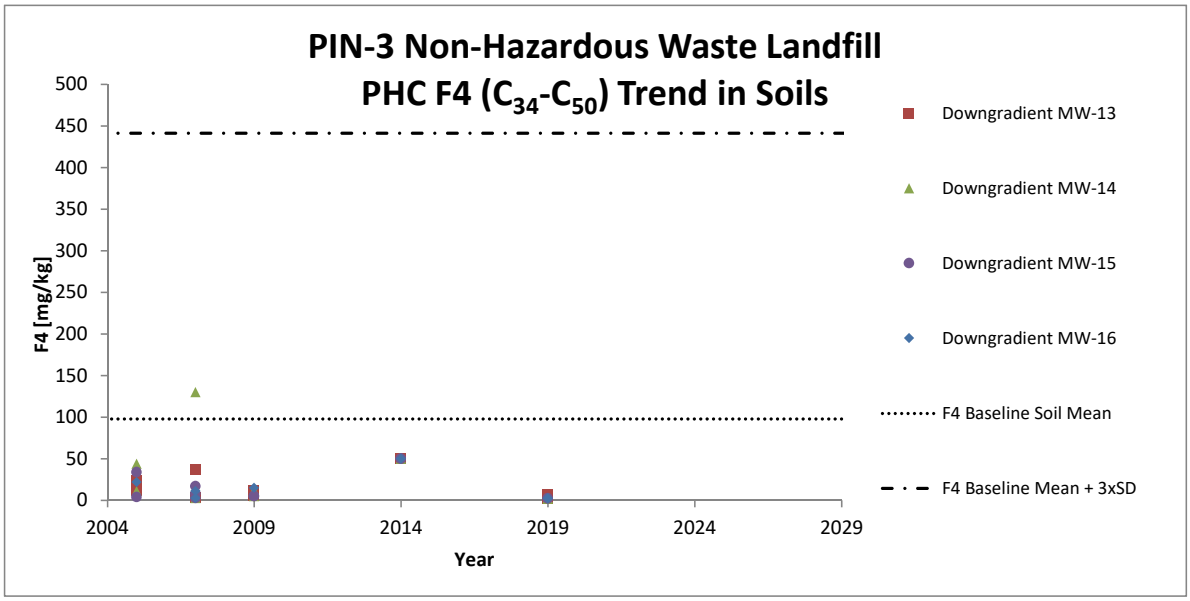


PIN-3 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



APPENDIX G6

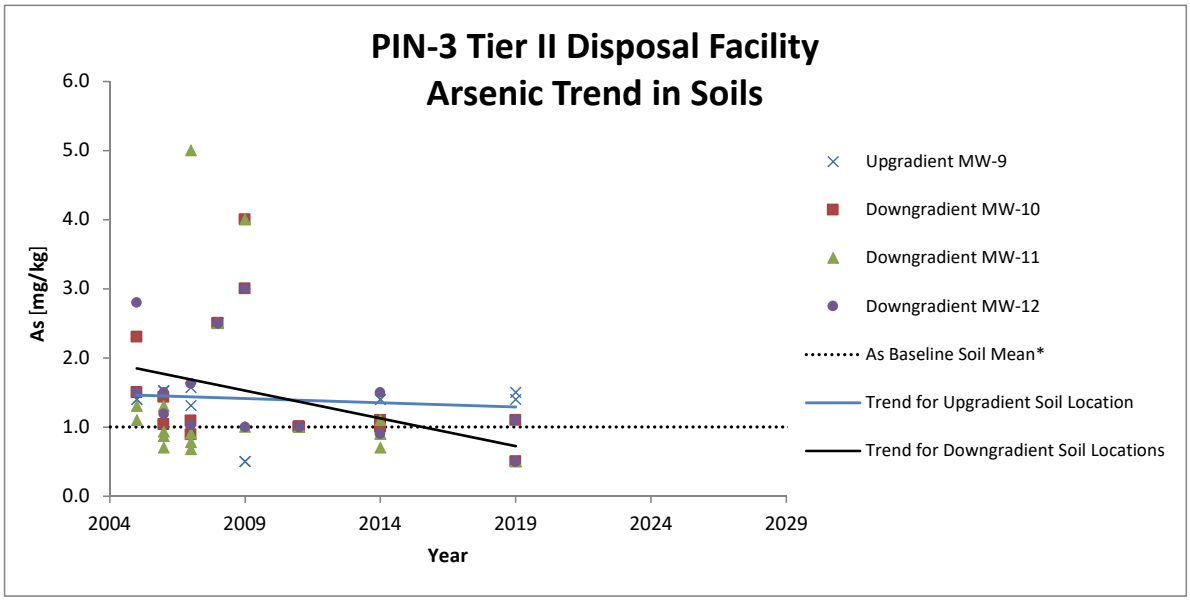
PIN-3 Tier II Disposal Facility Landfill – Trends in Soil Inorganics, PCBs and PHCs

PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

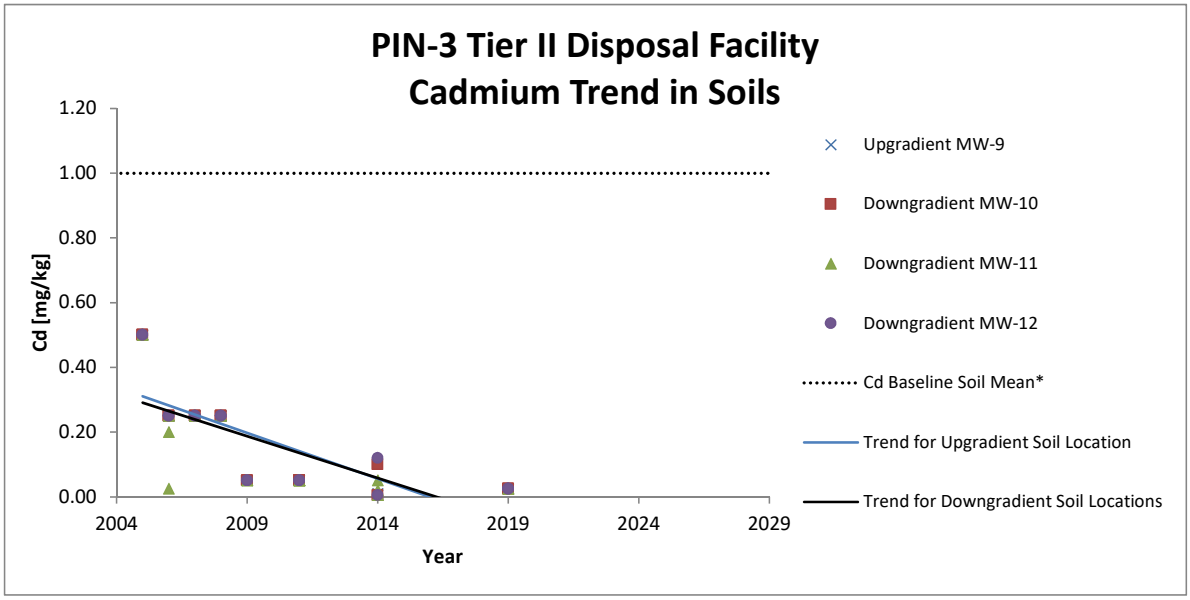
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



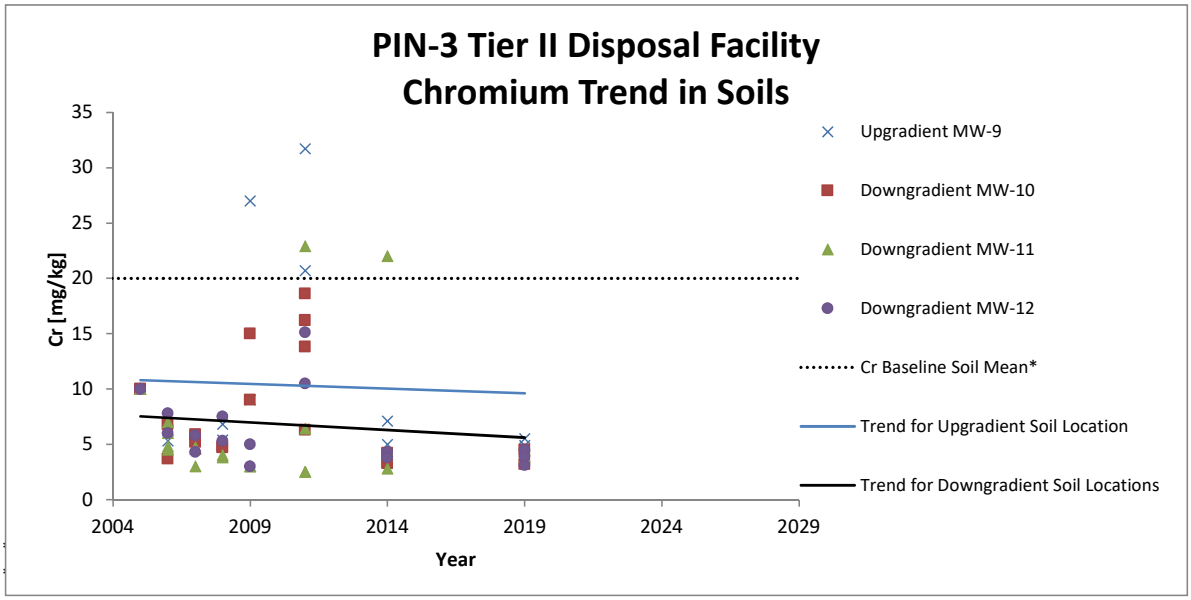
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

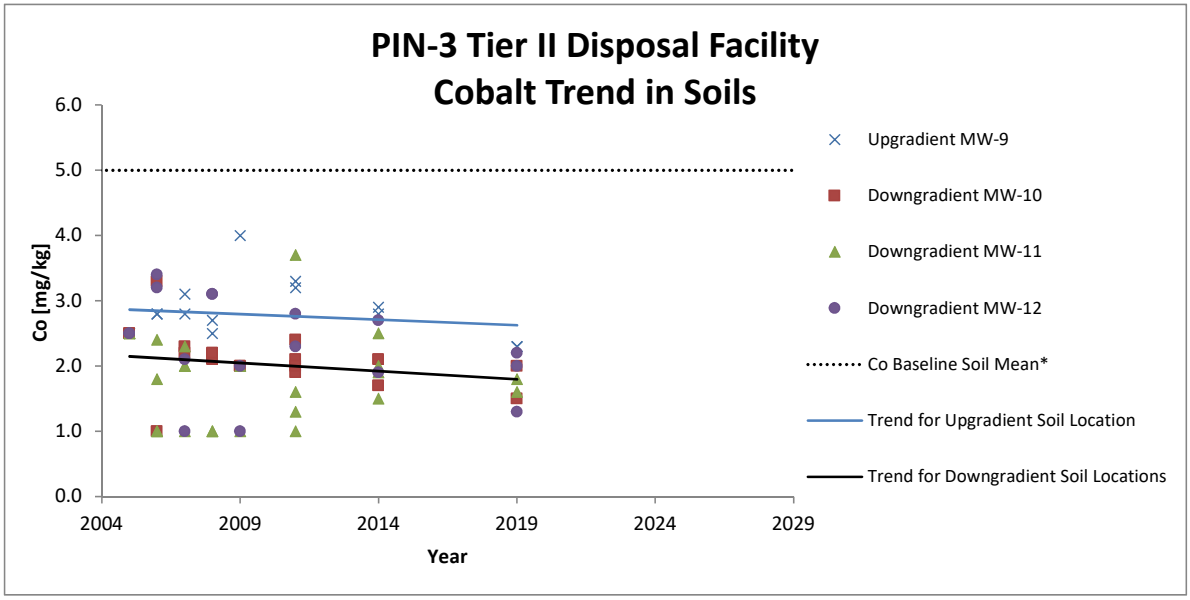
PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Co baseline arithmetic mean is equal to the baseline detection limit

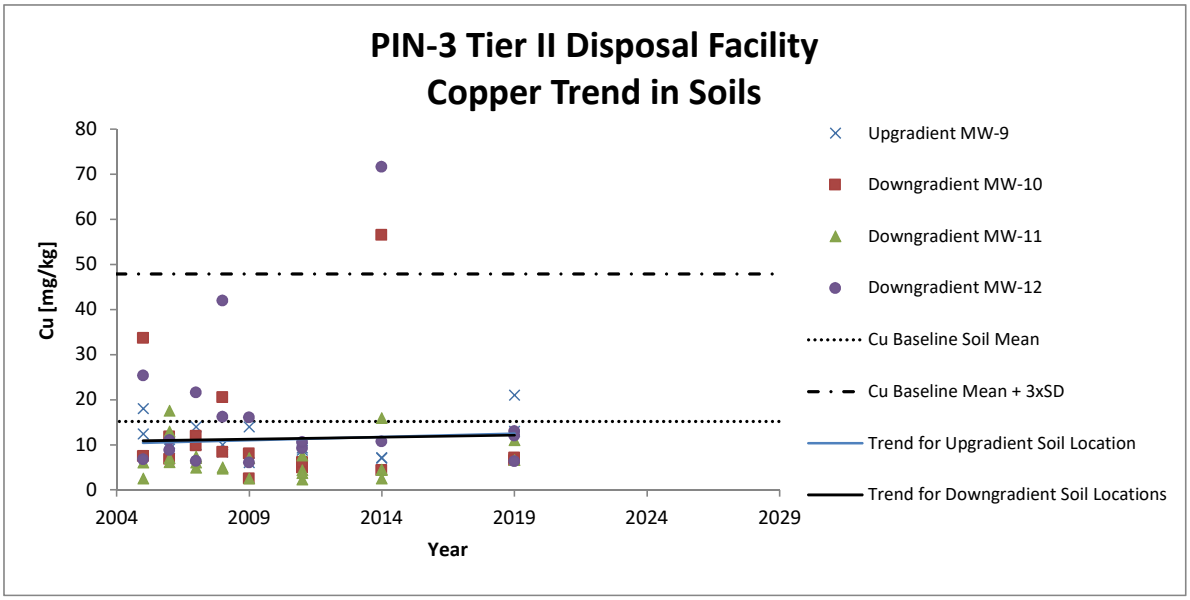
* Co baseline standard deviation = 0

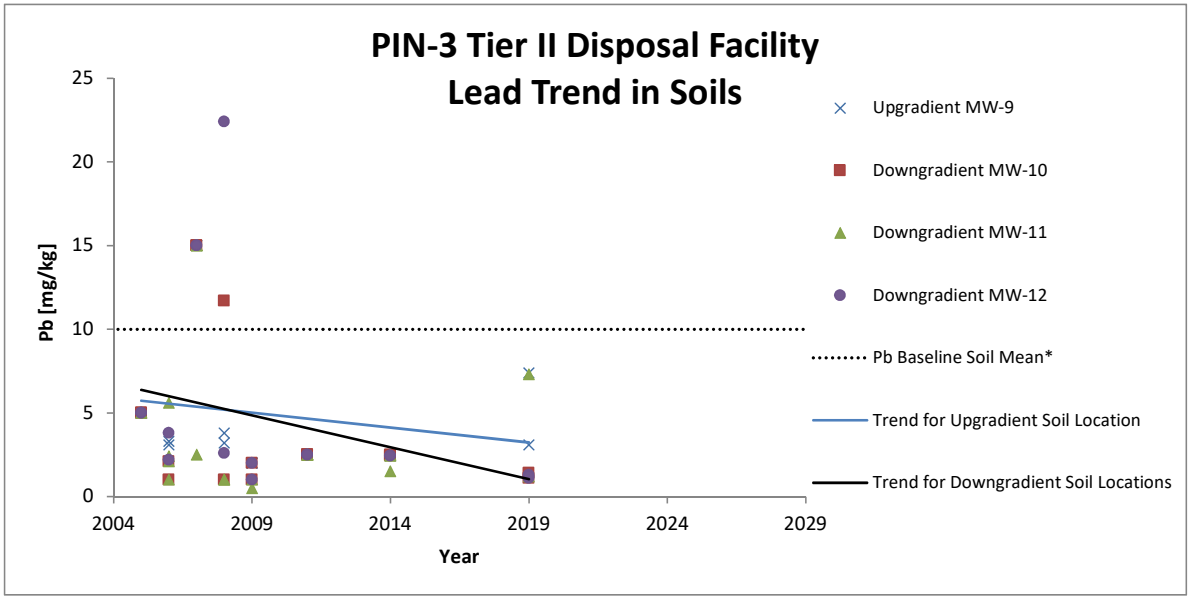
PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





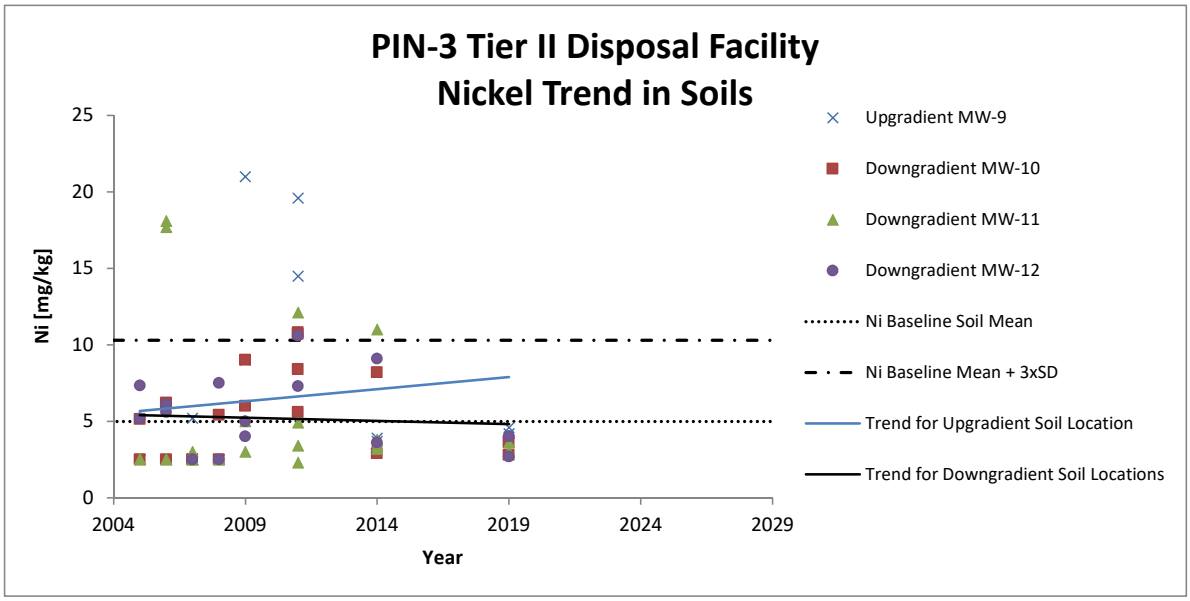
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

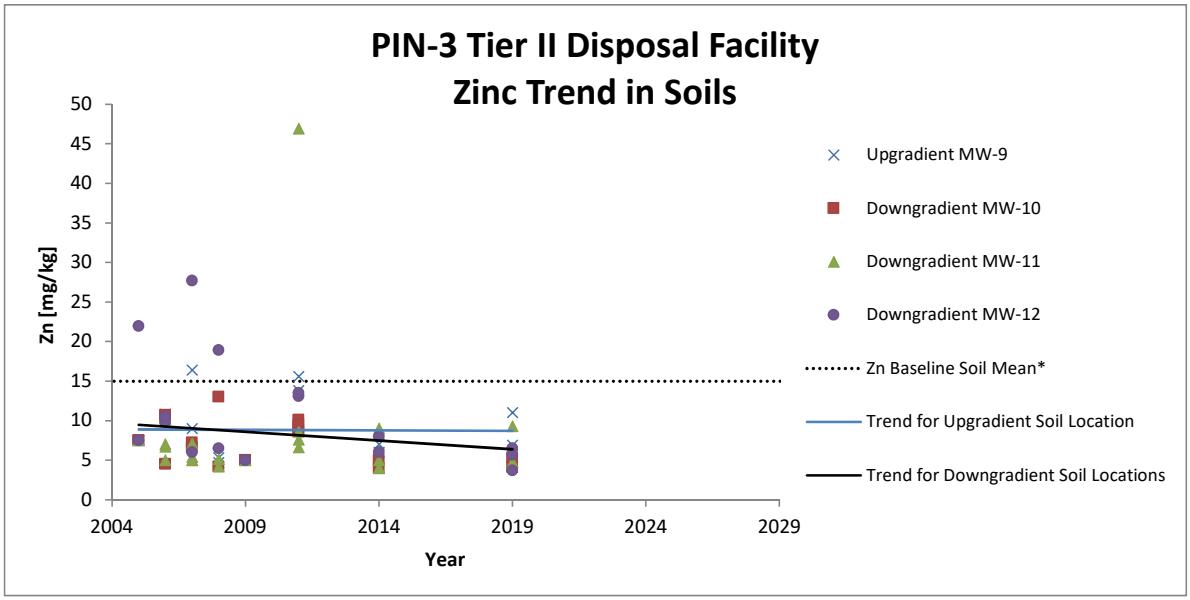
PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





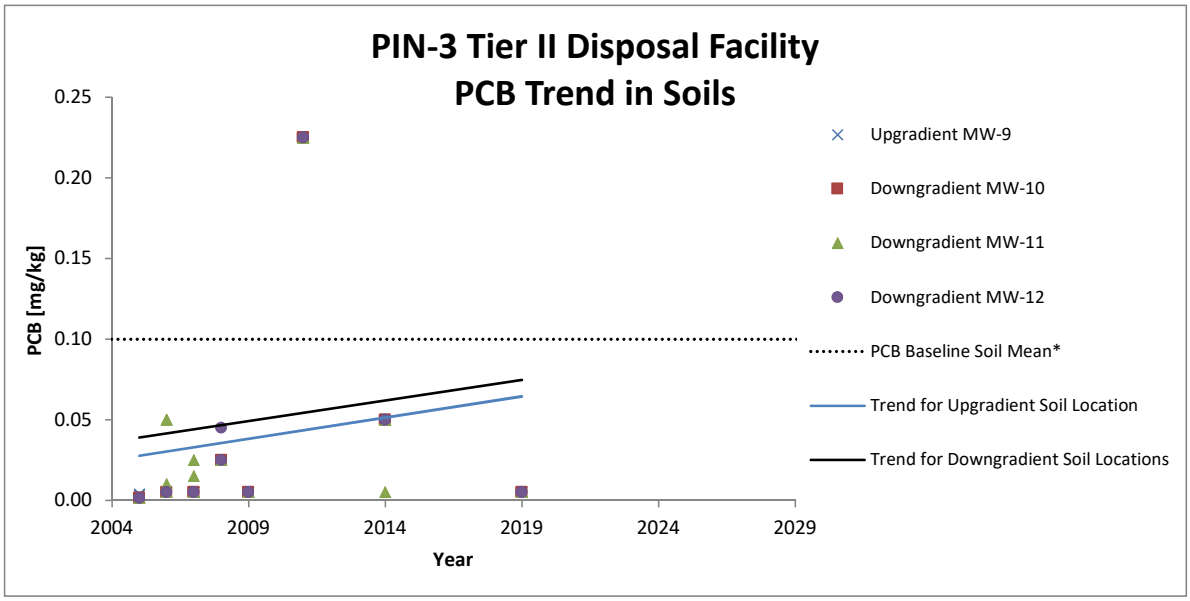
* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

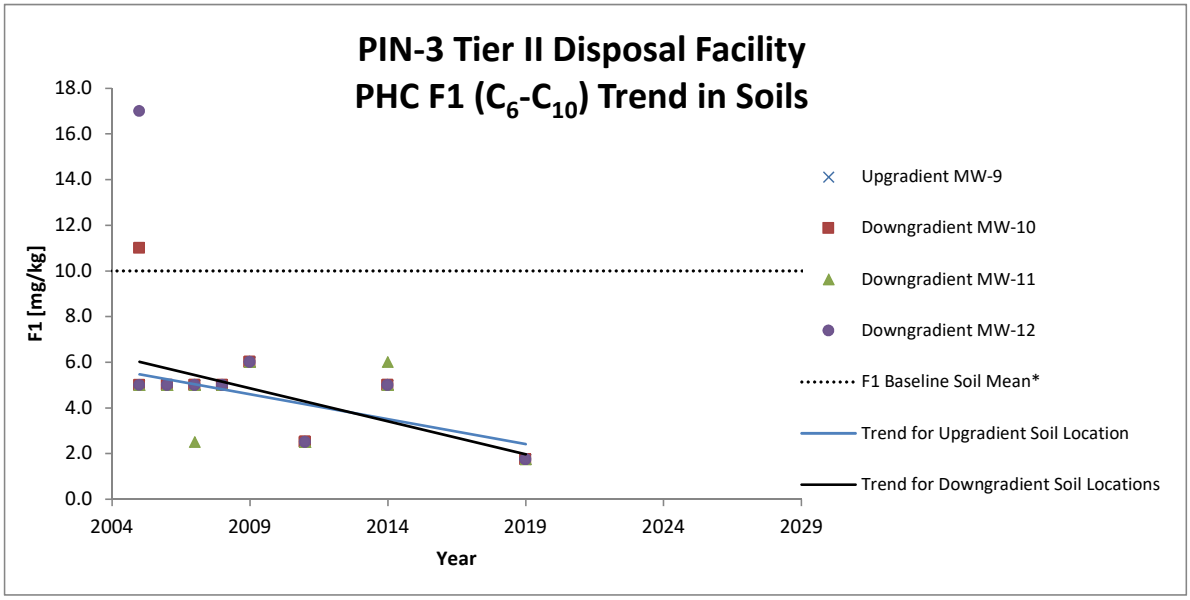
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



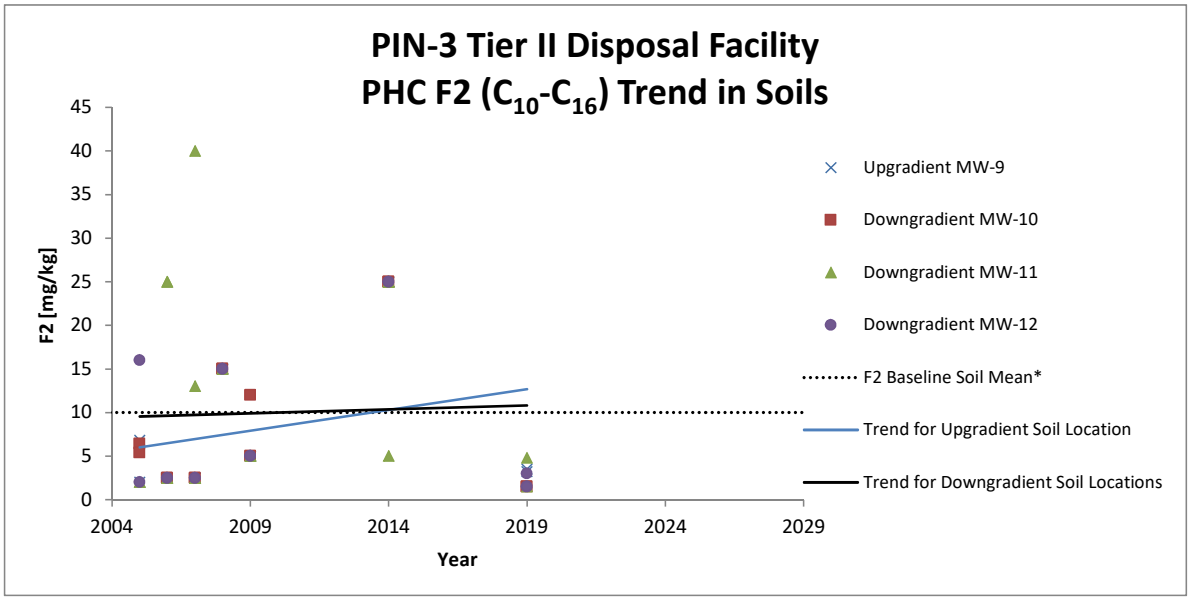
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



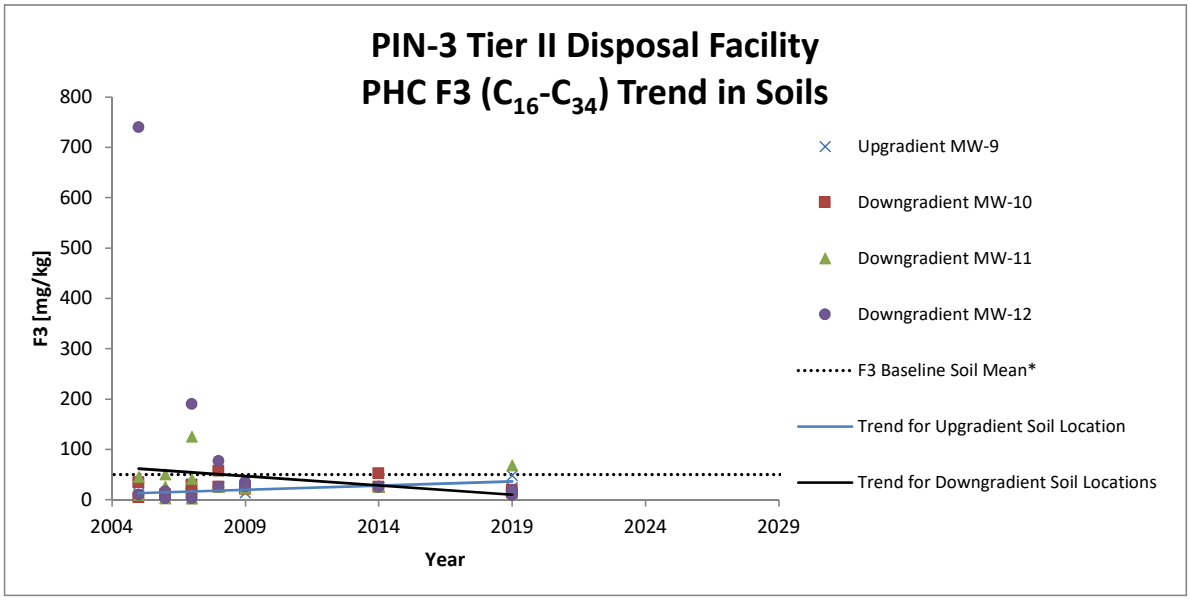
* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

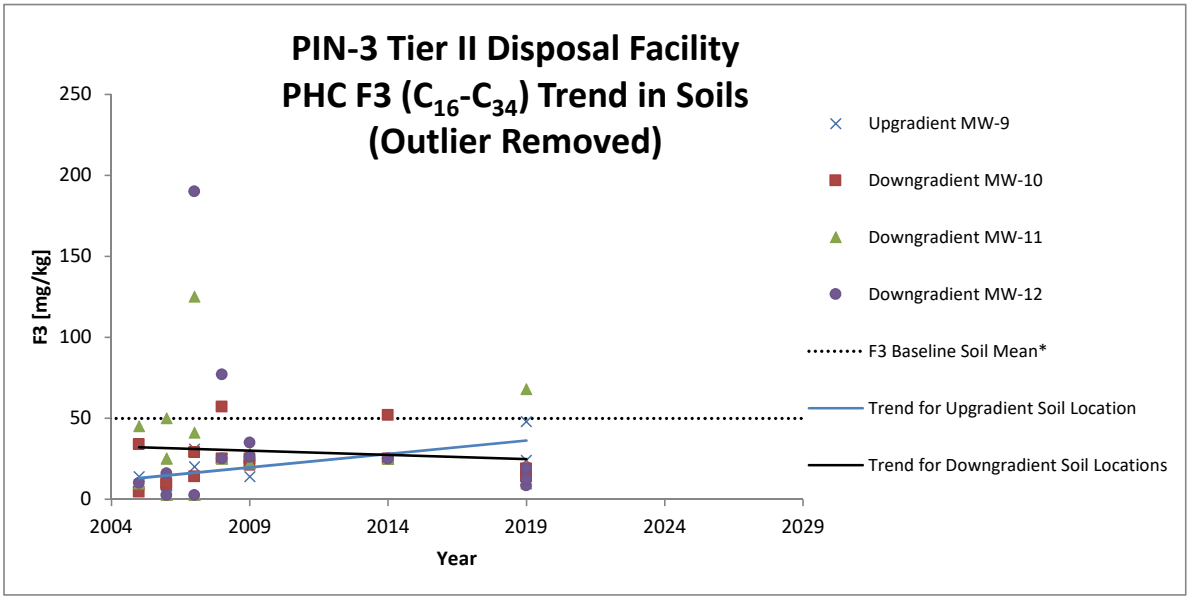
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the baseline detection limit
* F3 baseline standard deviation = 0



* F3 baseline arithmetic mean is equal to the baseline detection limit
* F3 baseline standard deviation = 0

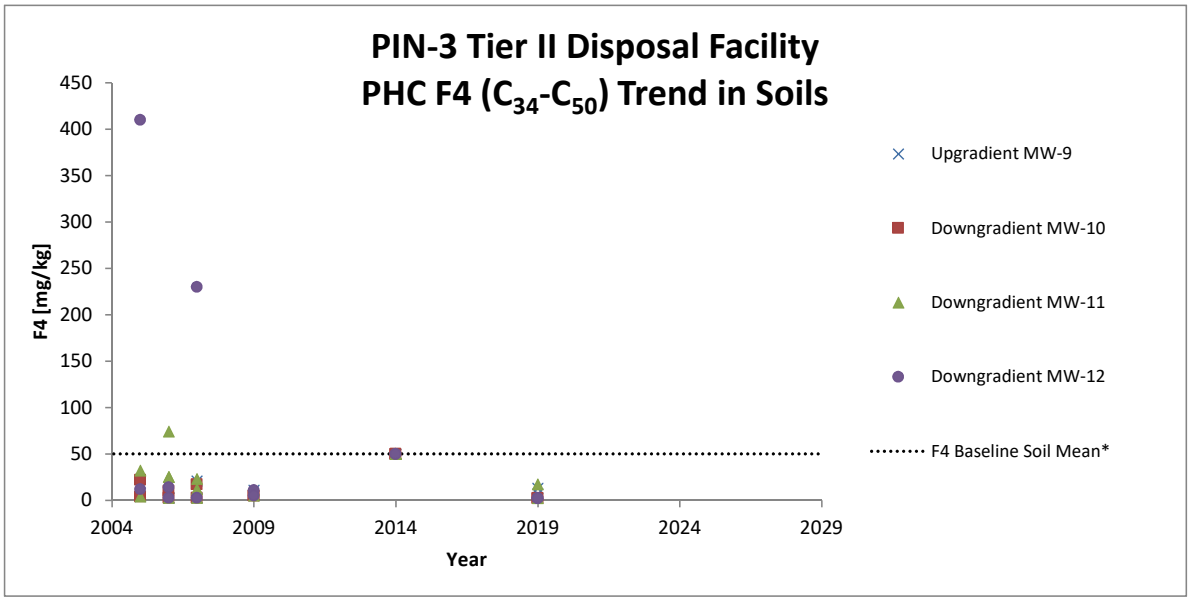
PHC F3 result from downgradient location MW-12 in 2005 is not shown on this chart

PIN-3 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F4 baseline arithmetic mean is equal to the baseline detection limit
* F4 baseline standard deviation = 0

Trend lines not shown for PHC F4 because 7 years of data not available

APPENDIX H

Groundwater Trend Analysis Graphs

APPENDIX H1

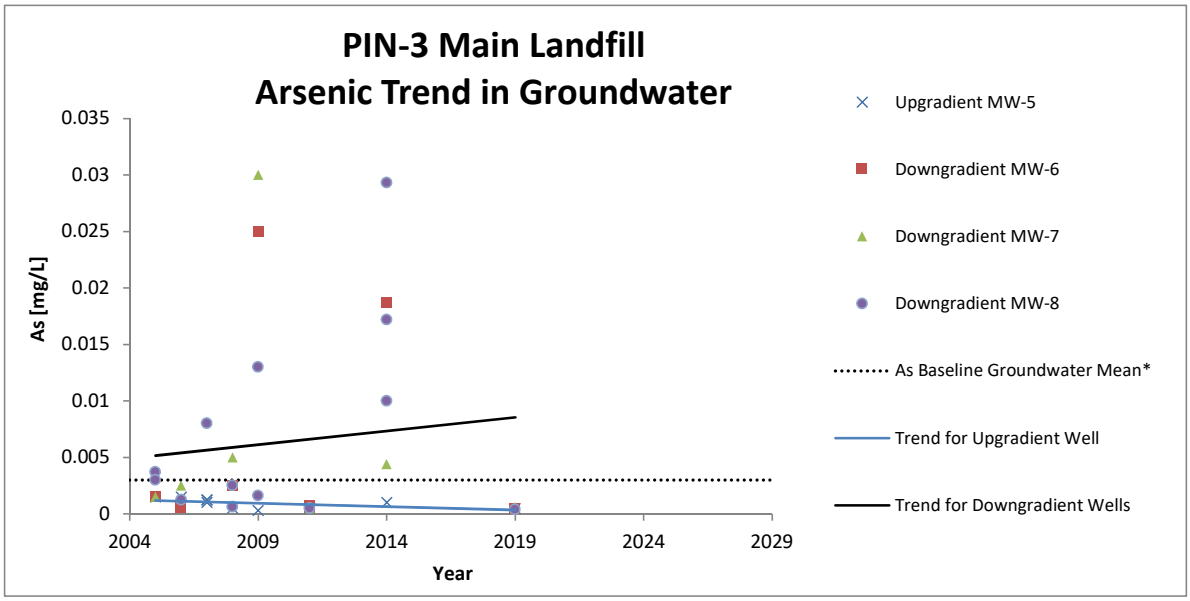
PIN-3 Main Landfill – Groundwater Trend Analysis Graphs

PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

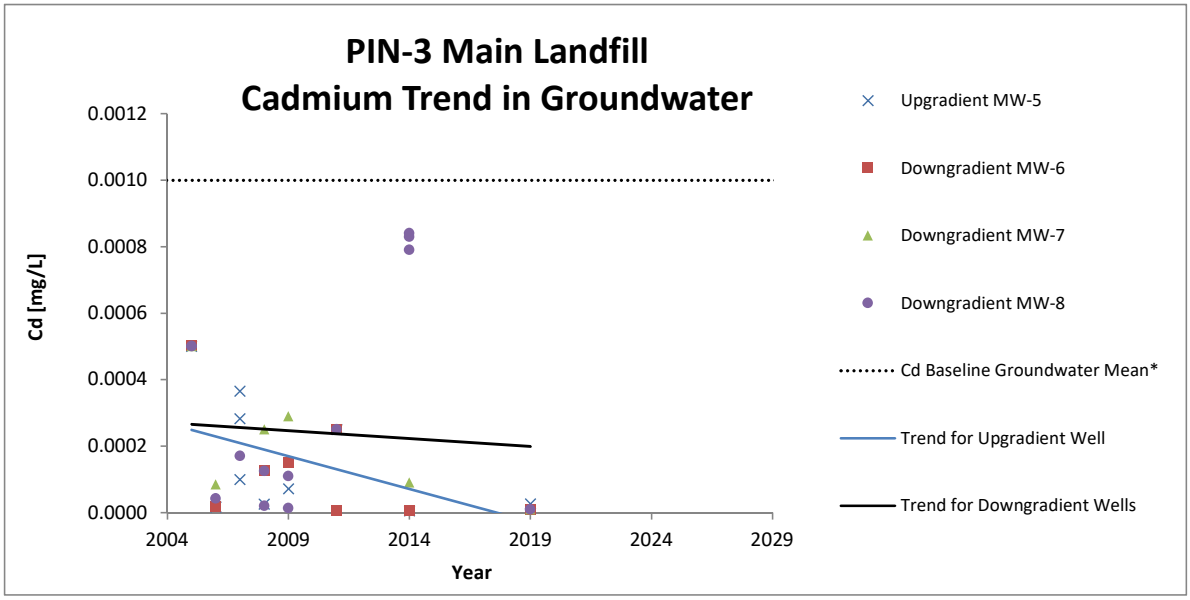
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



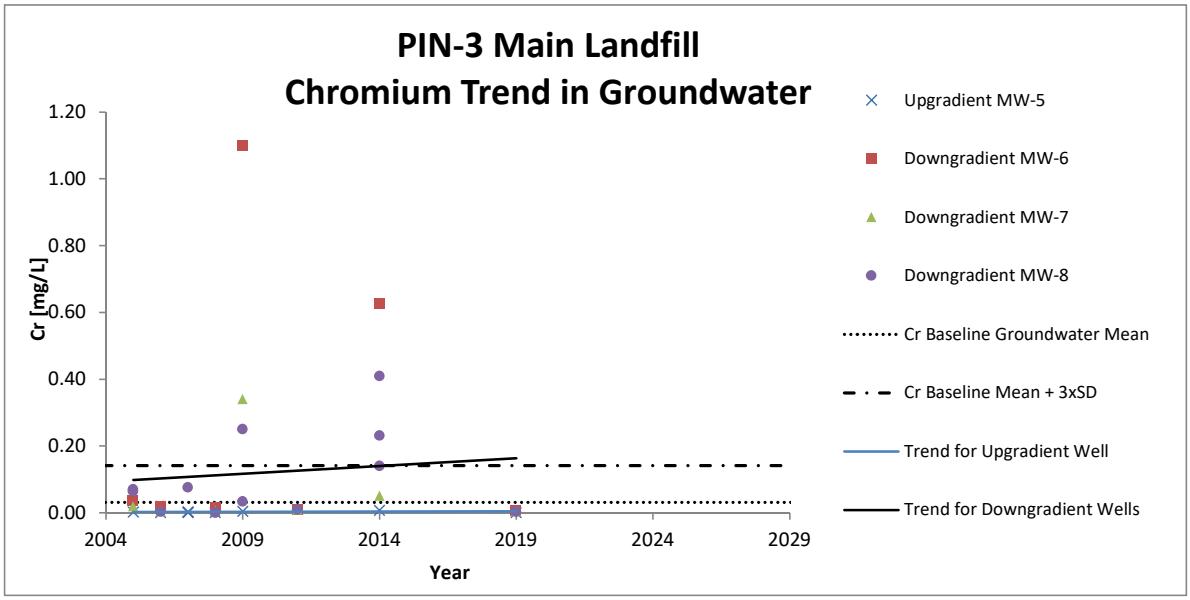
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

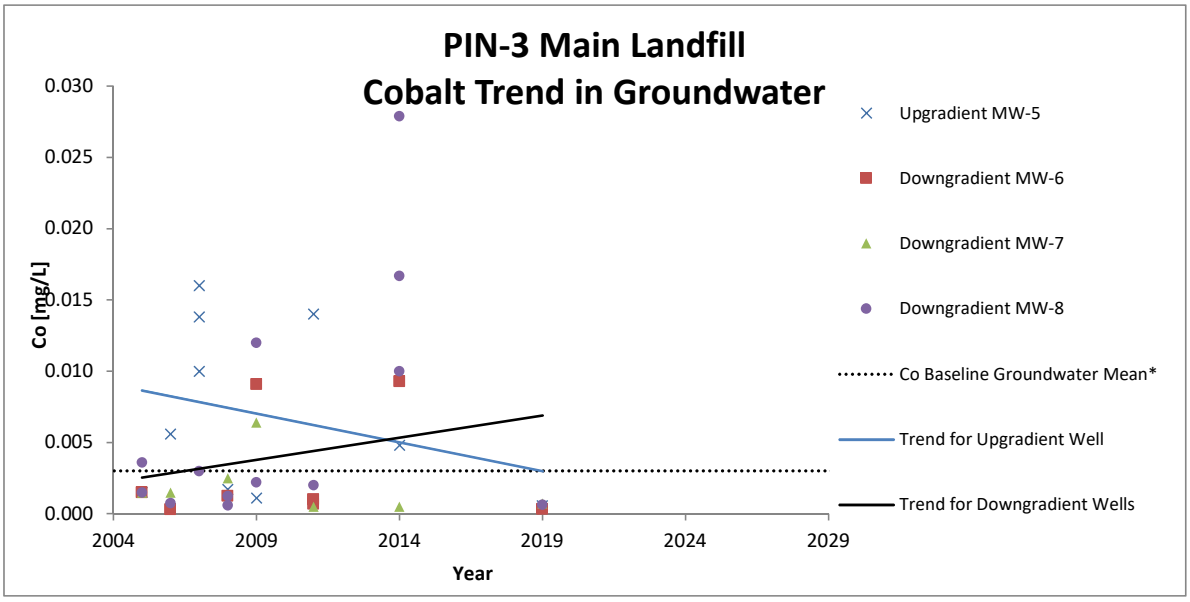
PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





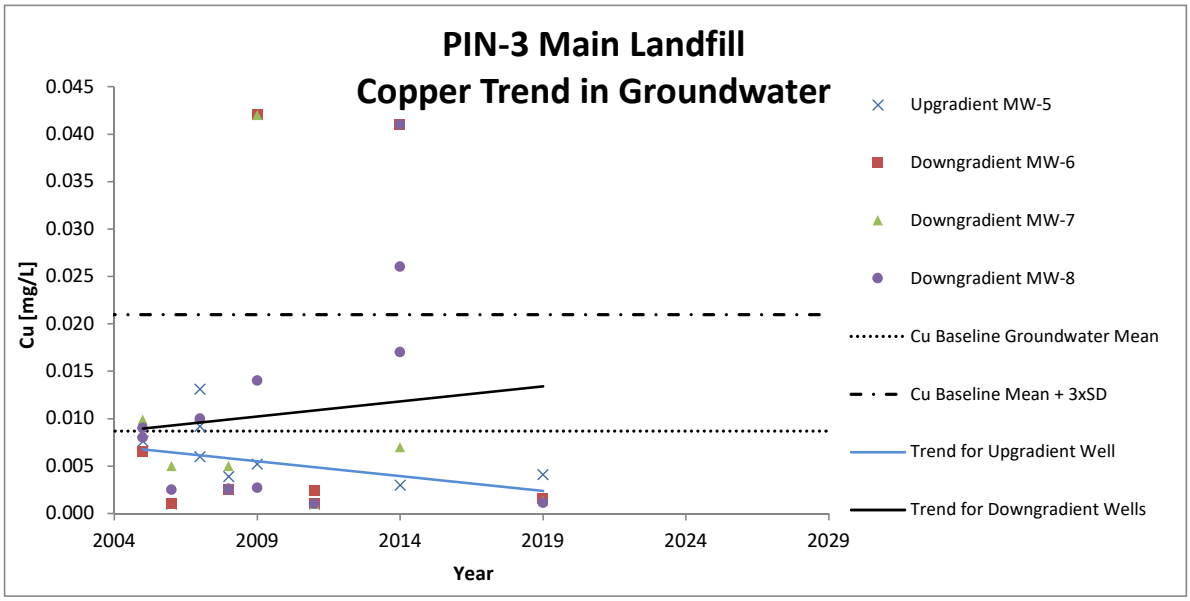
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

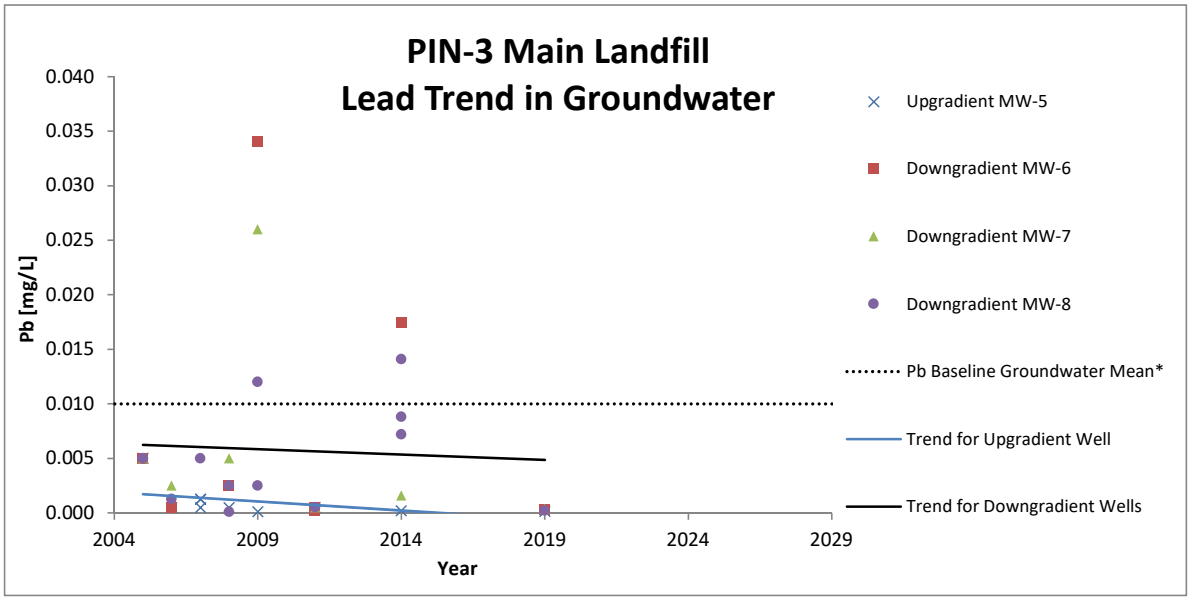
PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





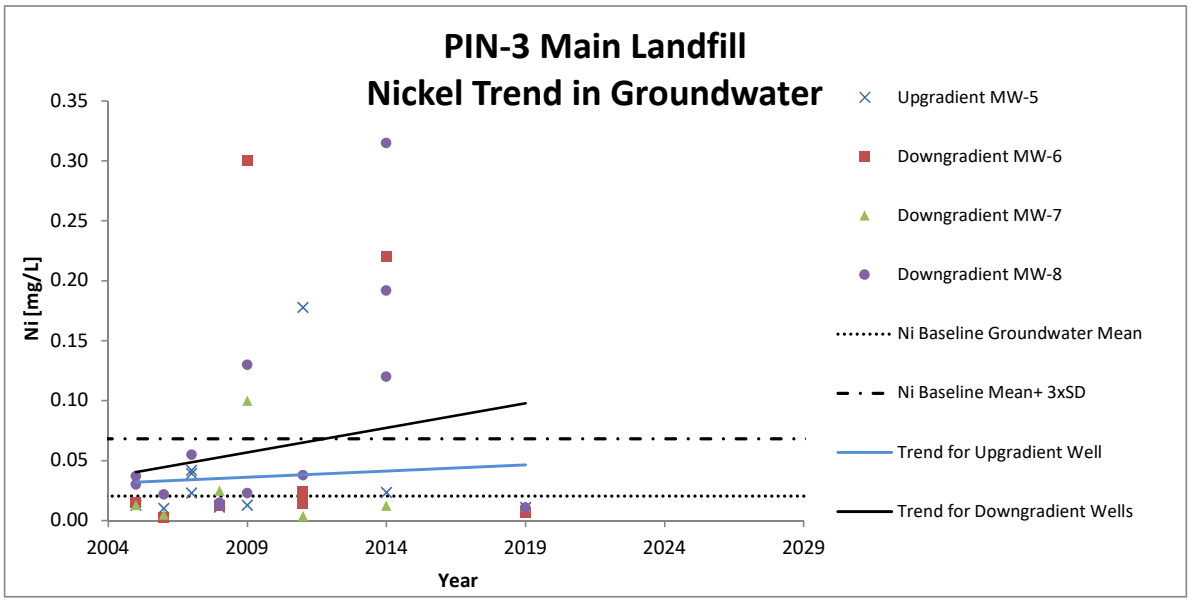
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

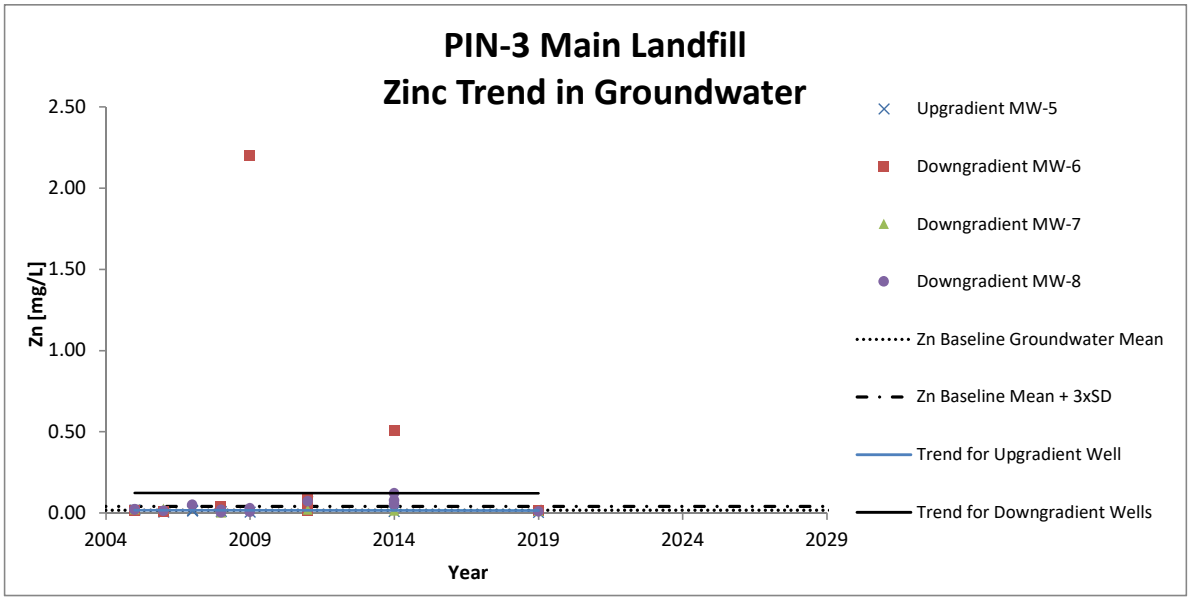
PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



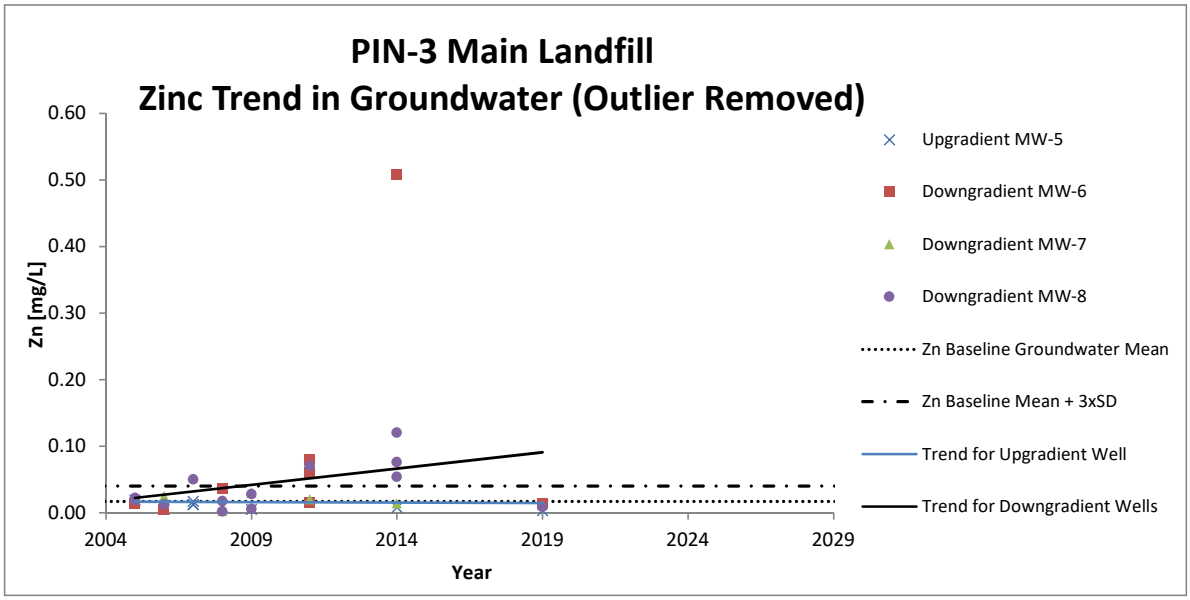


PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

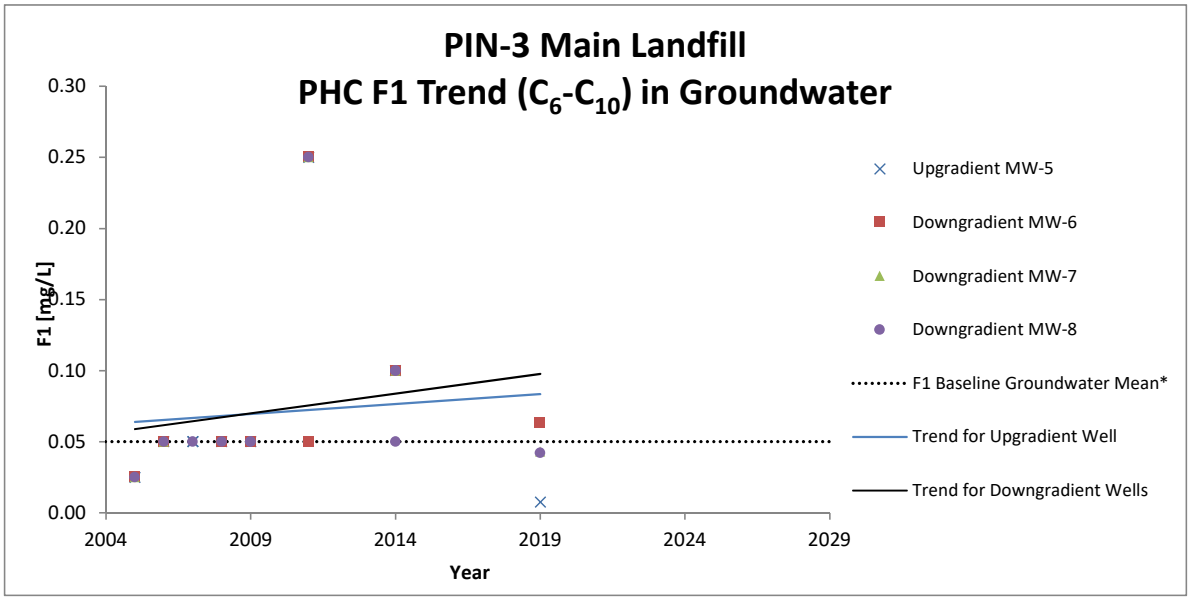
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Zn result from downgradient location MW-6 in 2009 is not shown on this chart



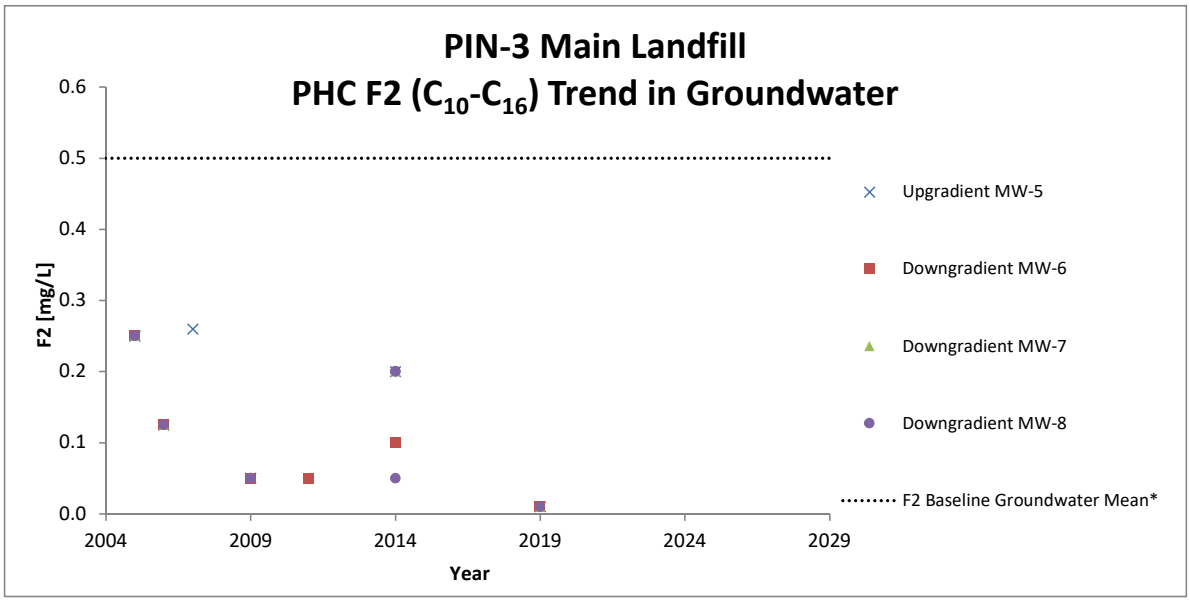
* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

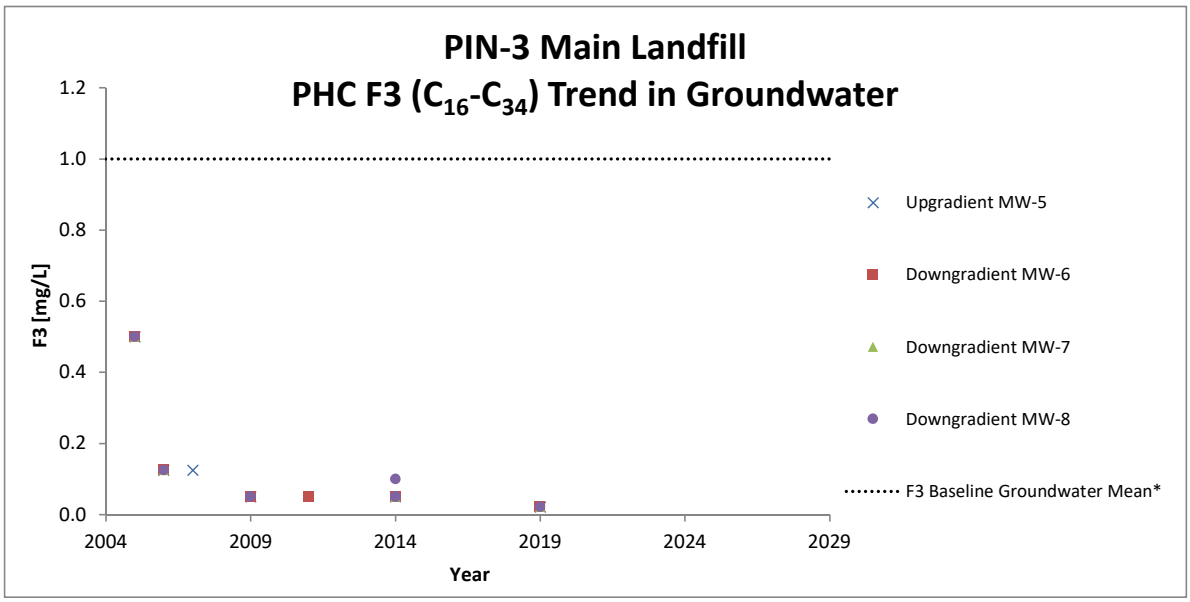
Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

Trend lines not shown for PHC F2 because 7 years of data not available



* F3 baseline arithmetic mean is equal to the baseline detection limit
* F3 baseline standard deviation = 0

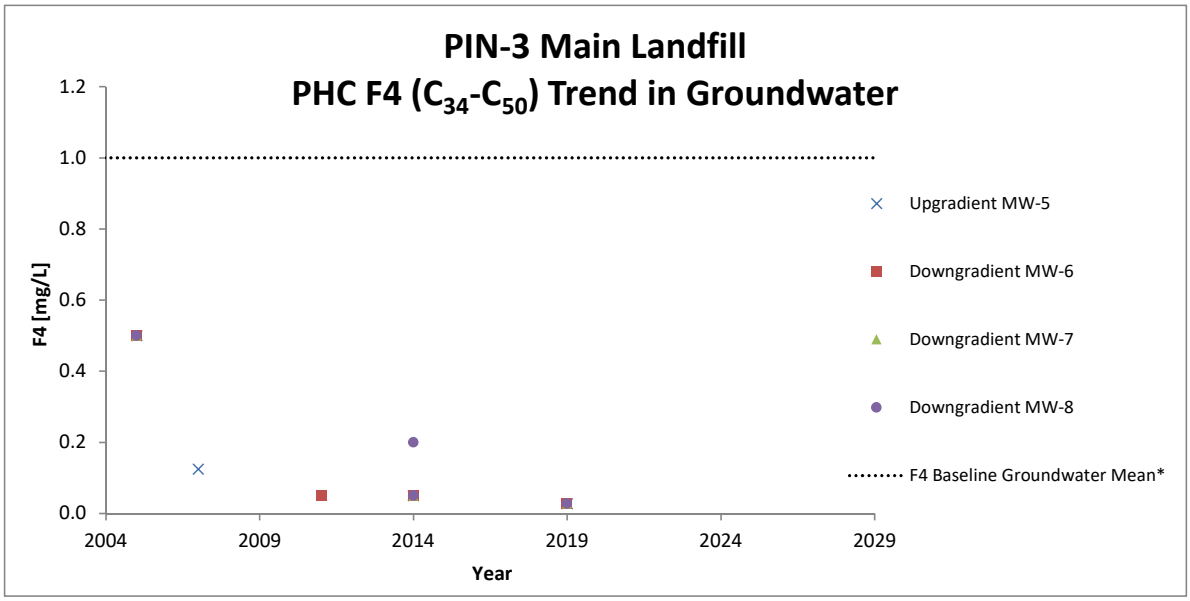
Trend lines not shown for PHC F3 because 7 years of data not available

PIN-3 Main Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F4 baseline arithmetic mean is equal to the baseline detection limit
* F4baseline standard deviation = 0

Trend lines not shown for PHC F4 because 7 years of data not available

APPENDIX H2

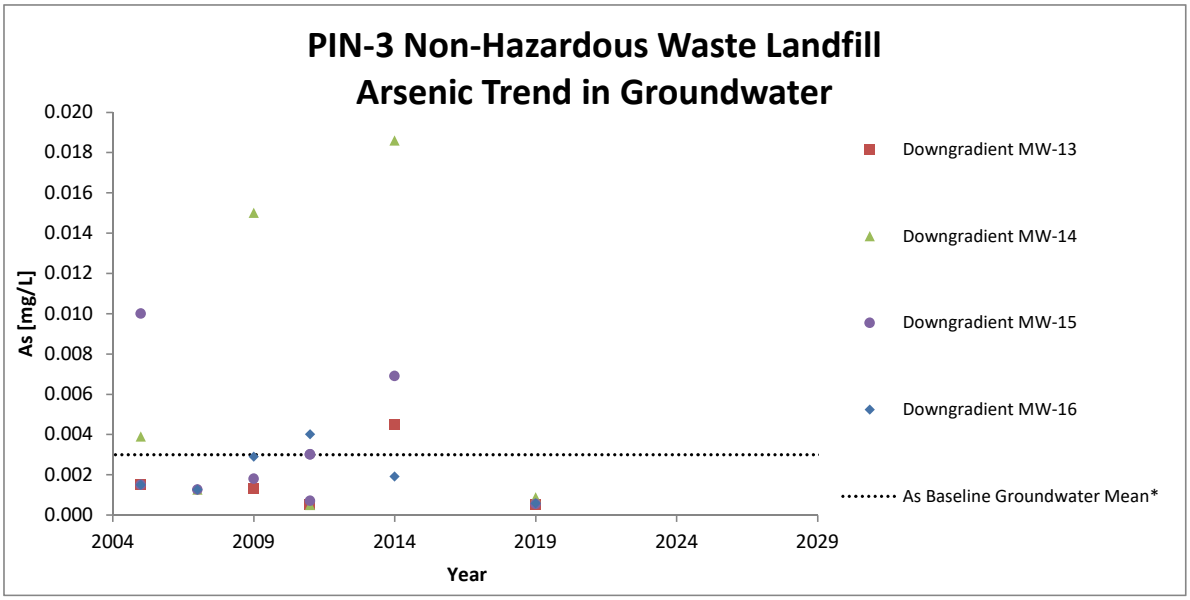
PIN-3 Non-Hazardous Waste Landfill – Groundwater Trend Analysis Graphs

PIN-3 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

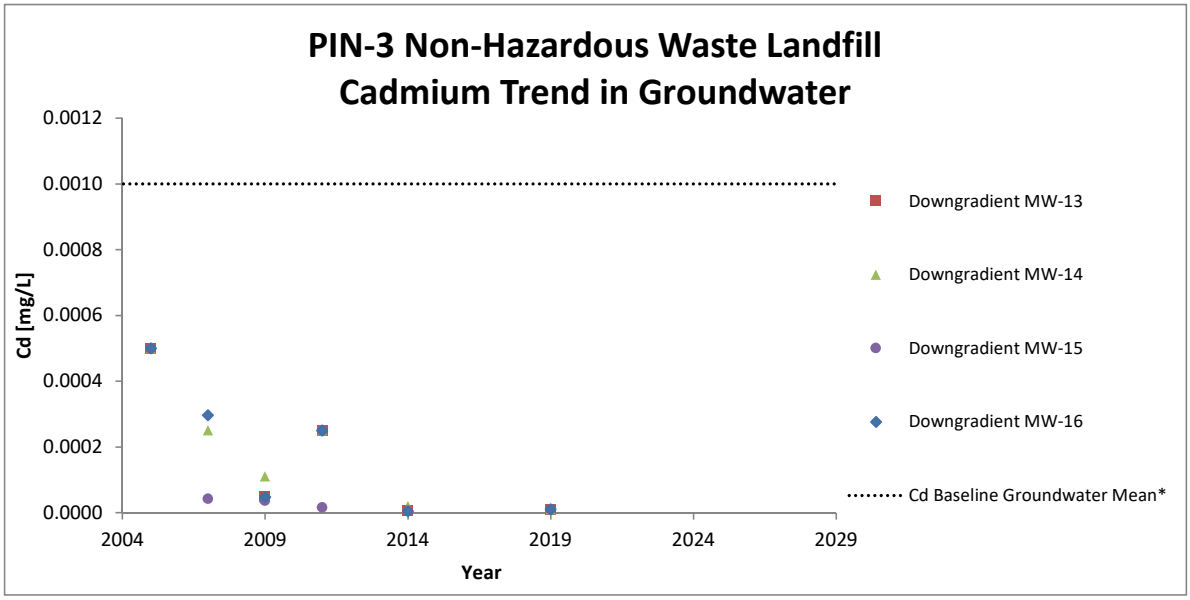
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



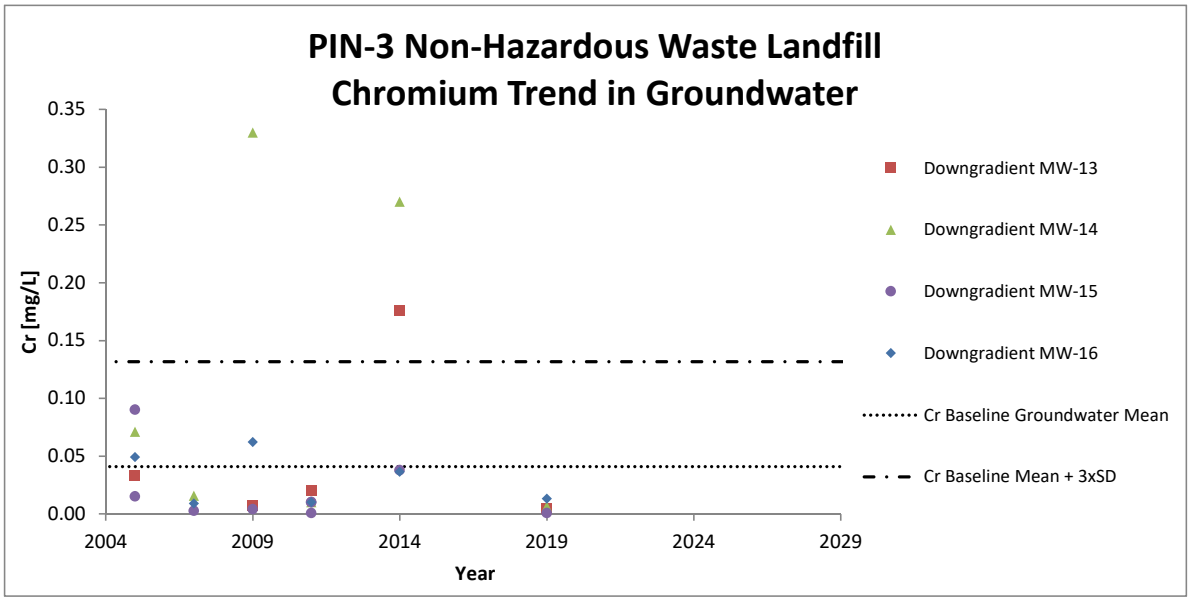
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

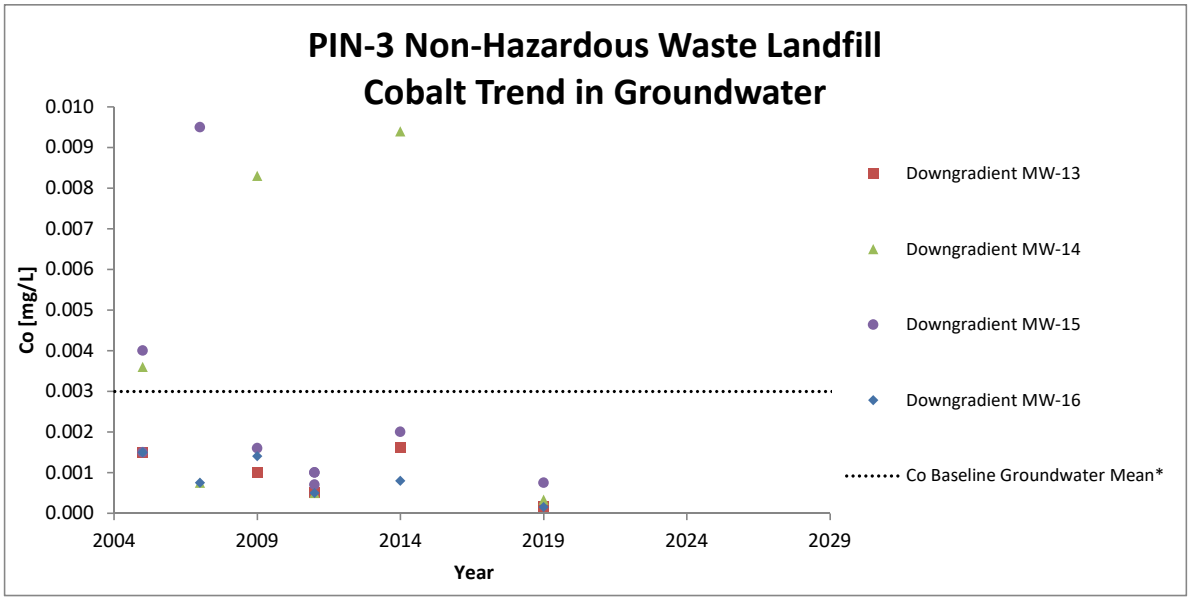
PIN-3 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Co baseline arithmetic mean is equal to the baseline detection limit

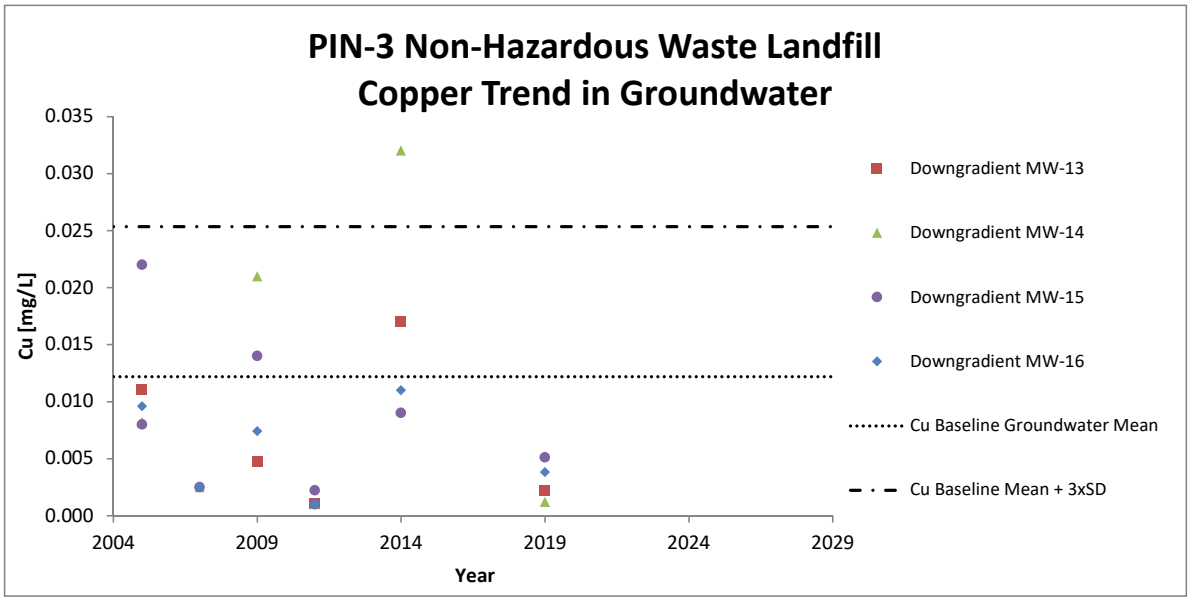
* Co baseline standard deviation = 0

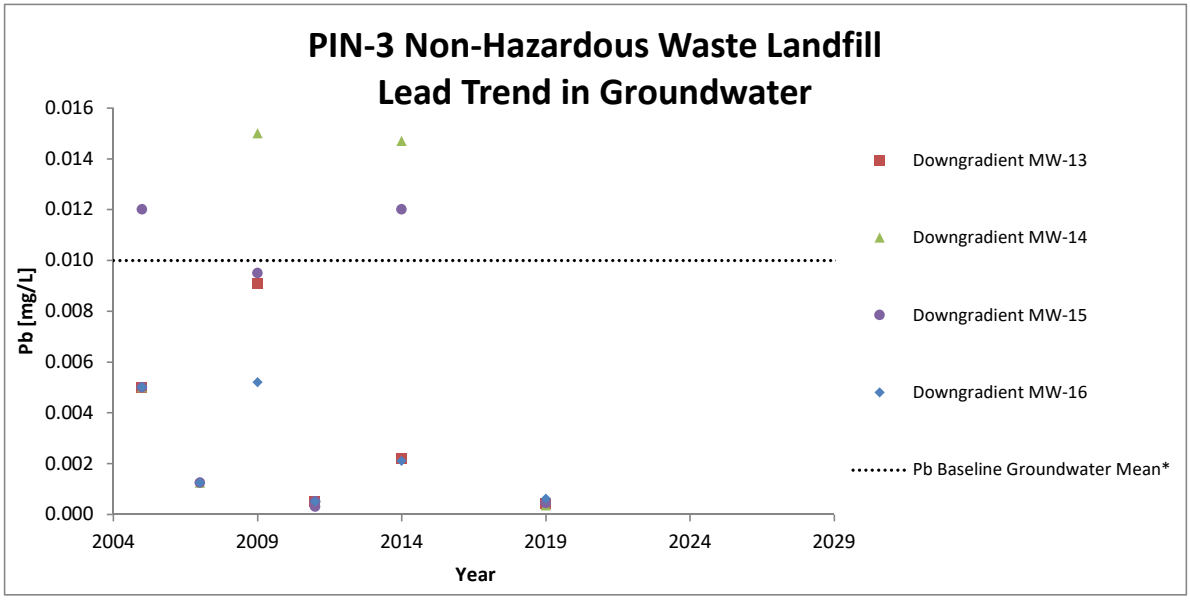
PIN-3 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Pb baseline arithmetic mean is equal to the baseline detection limit

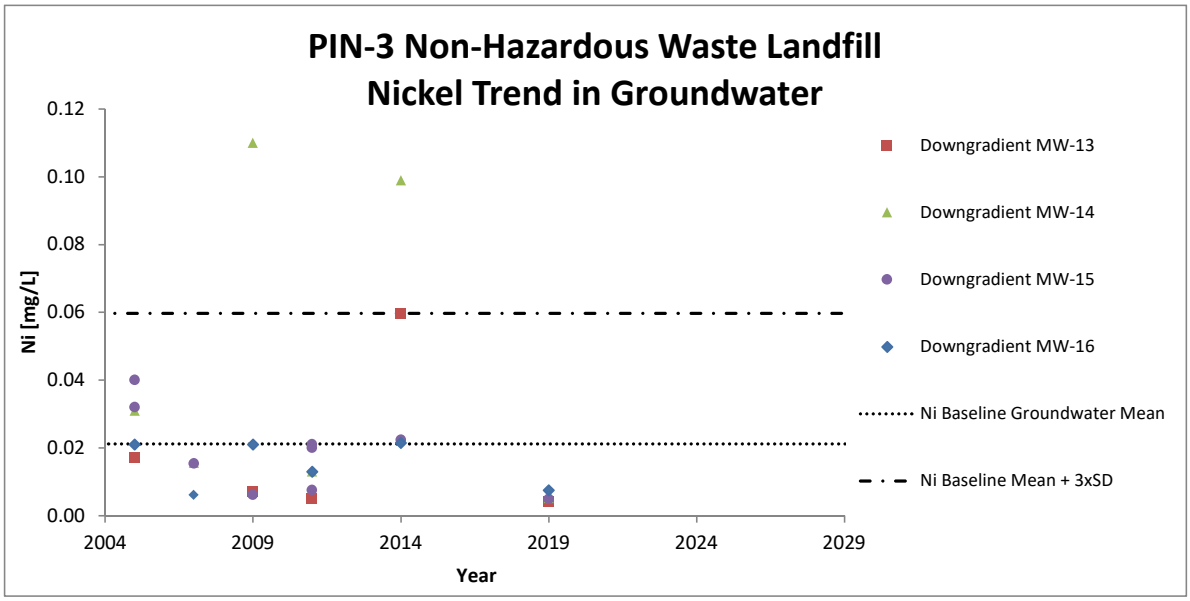
* Pb baseline standard deviation = 0

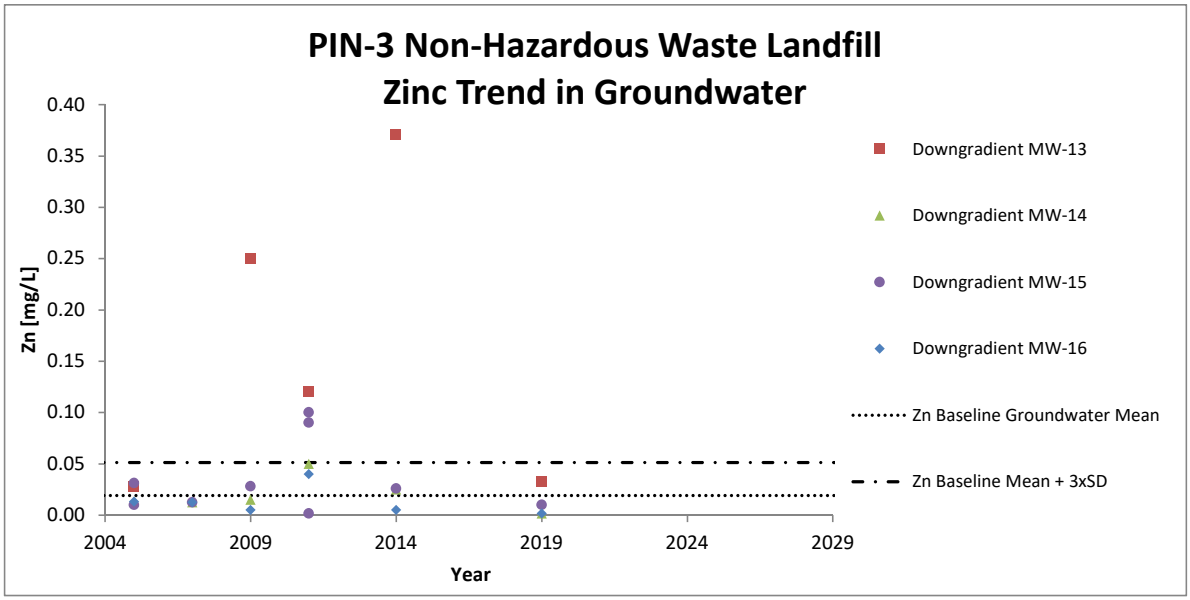
PIN-3 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



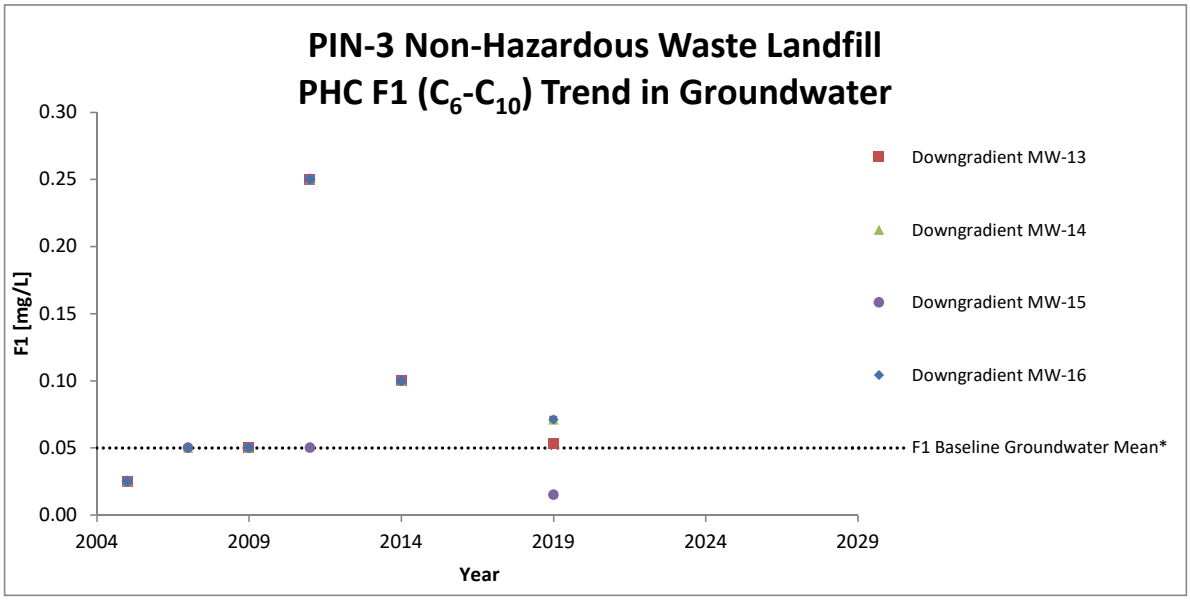


PIN-3 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

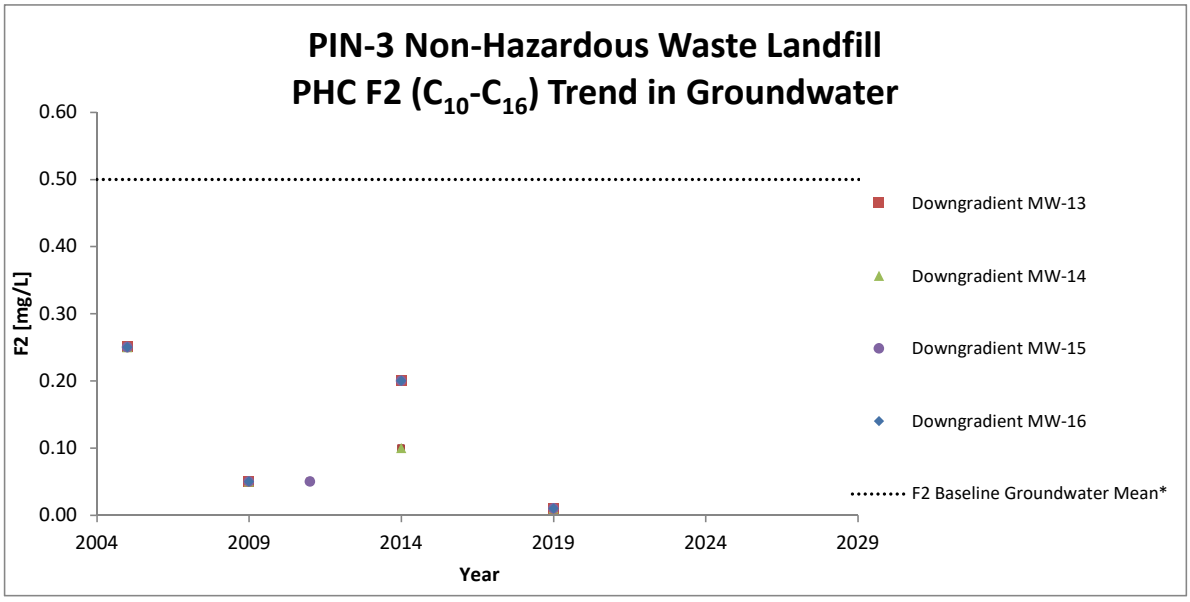
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0



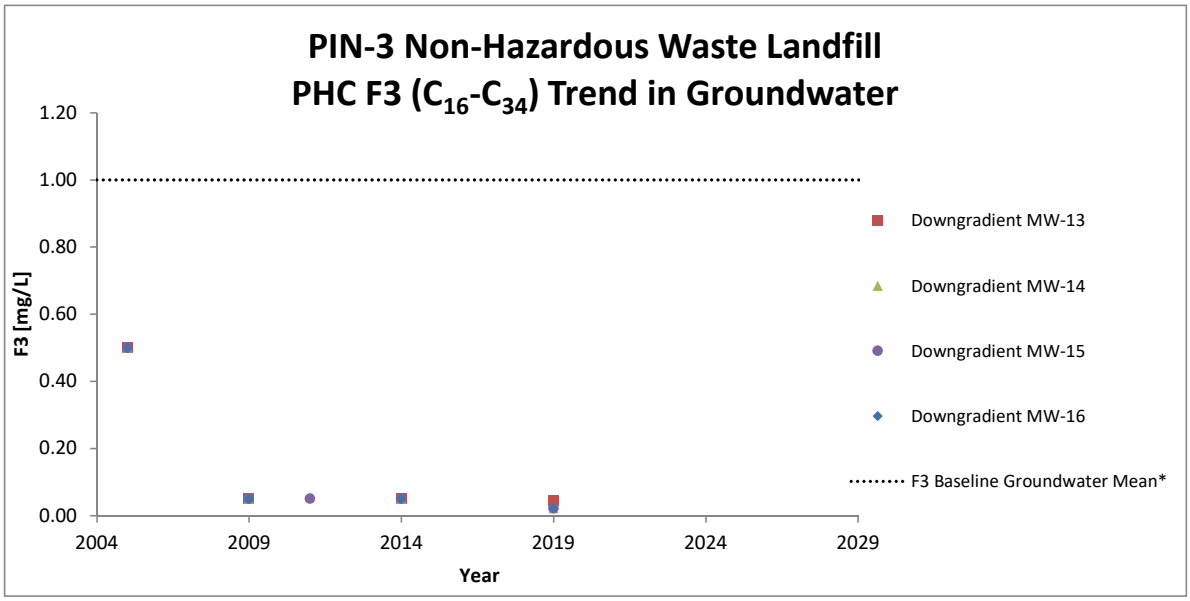
* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

PIN-3 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

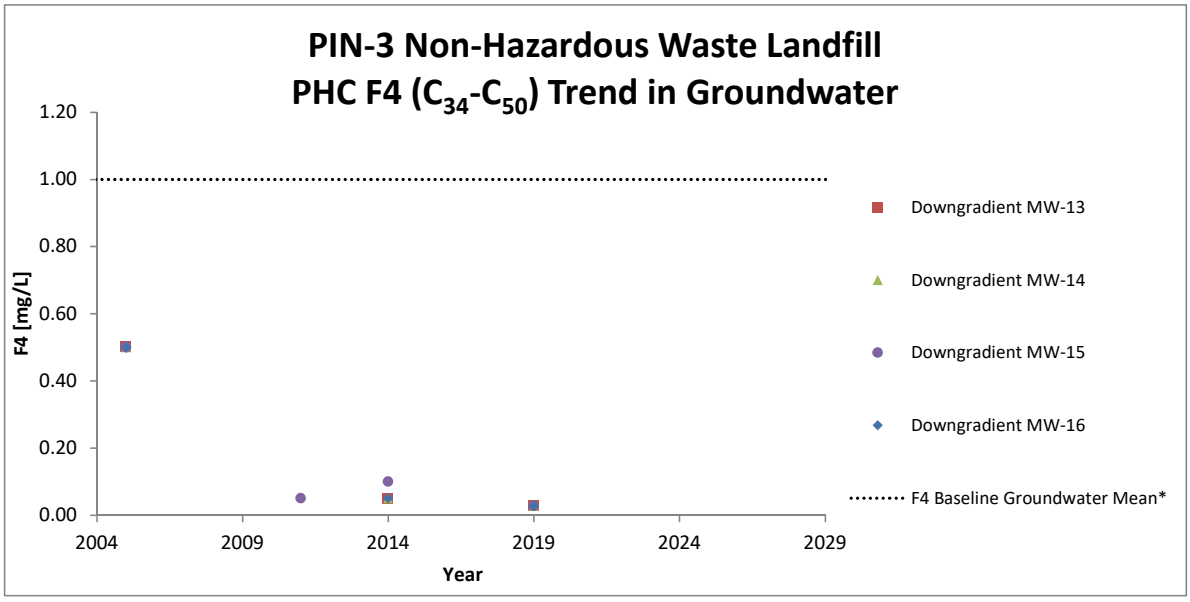
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the baseline detection limit
* F3 baseline standard deviation = 0



* F4 baseline arithmetic mean is equal to the baseline detection limit
* F4baseline standard deviation = 0

APPENDIX H3

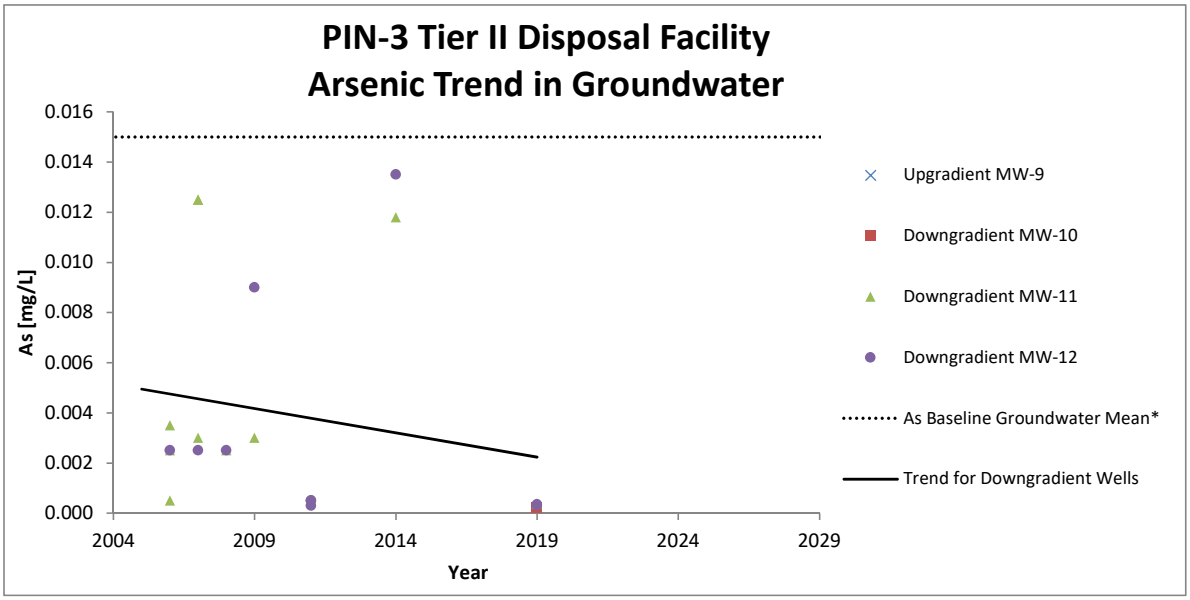
PIN-3 Tier II Disposal Facility – Groundwater Trend Analysis Graphs

PIN-3 Tier II Disposal Facility Trends in Groundwater Inorganics and PHCs

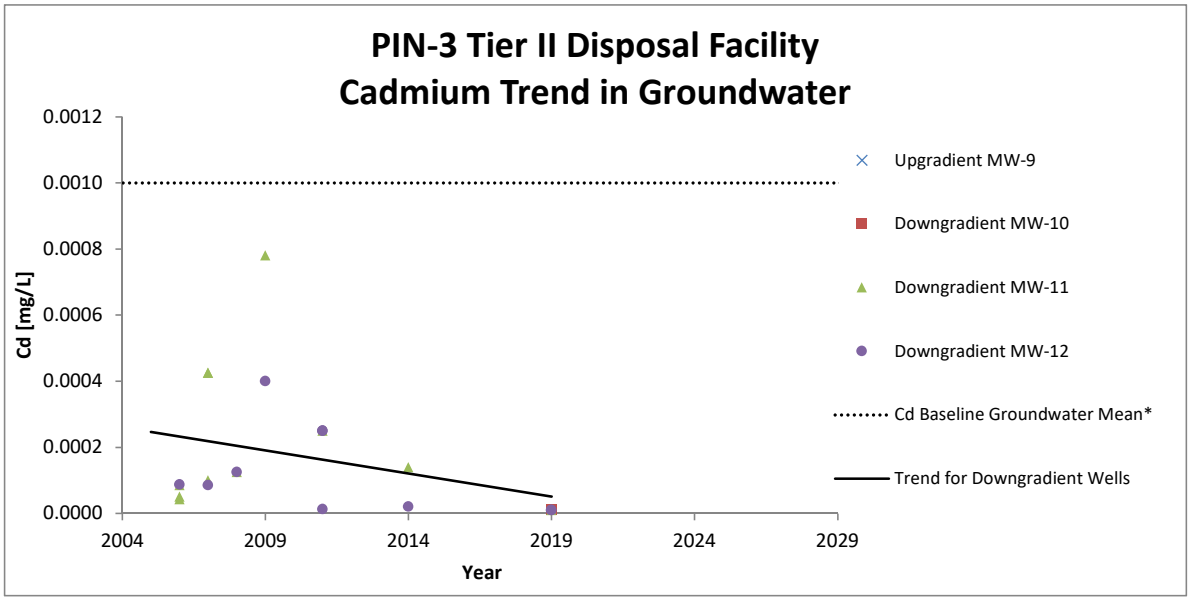
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



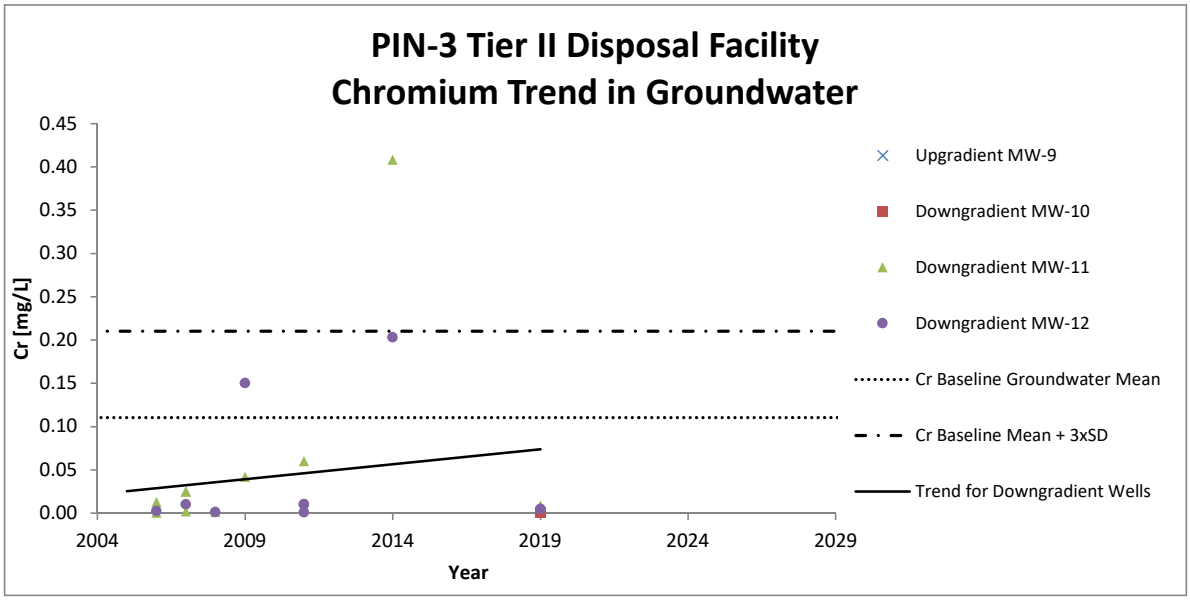
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

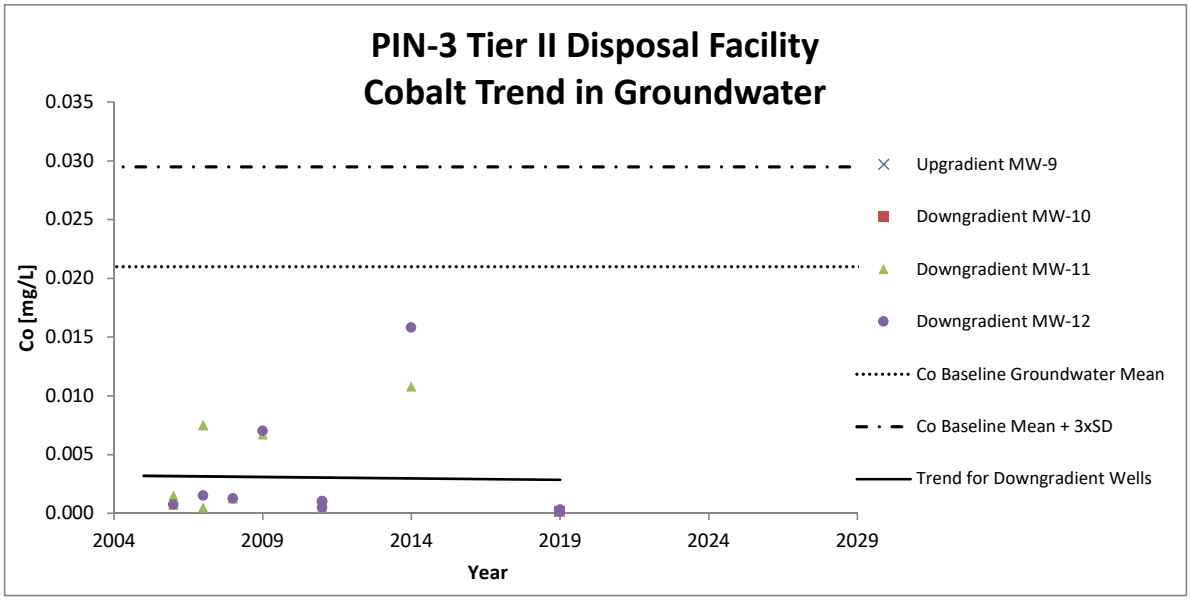
PIN-3 Tier II Disposal Facility Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



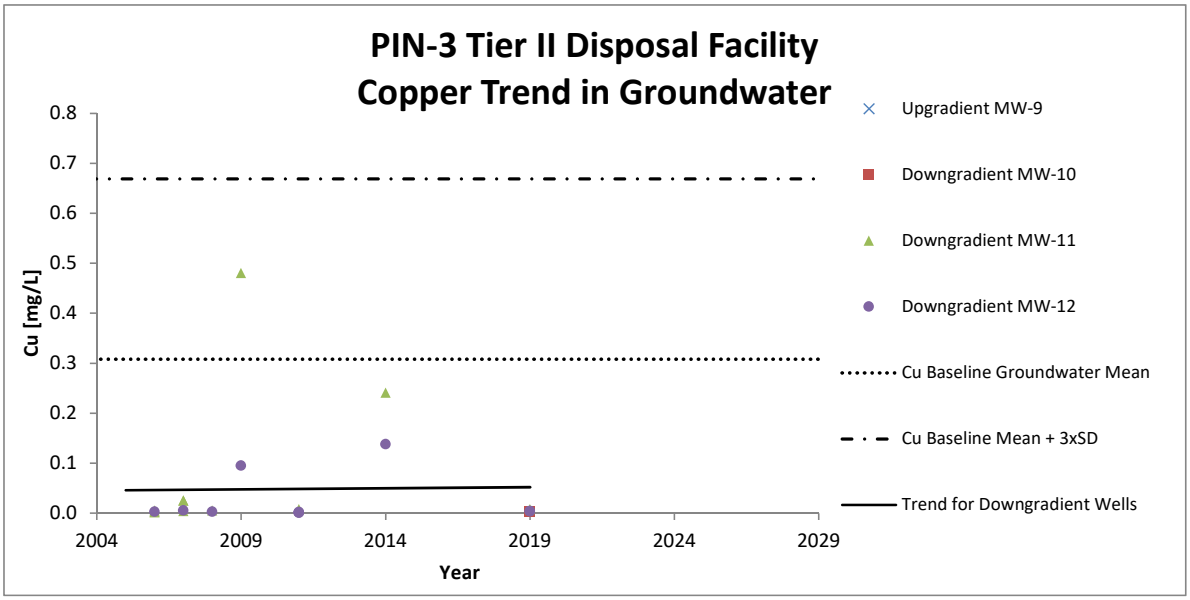


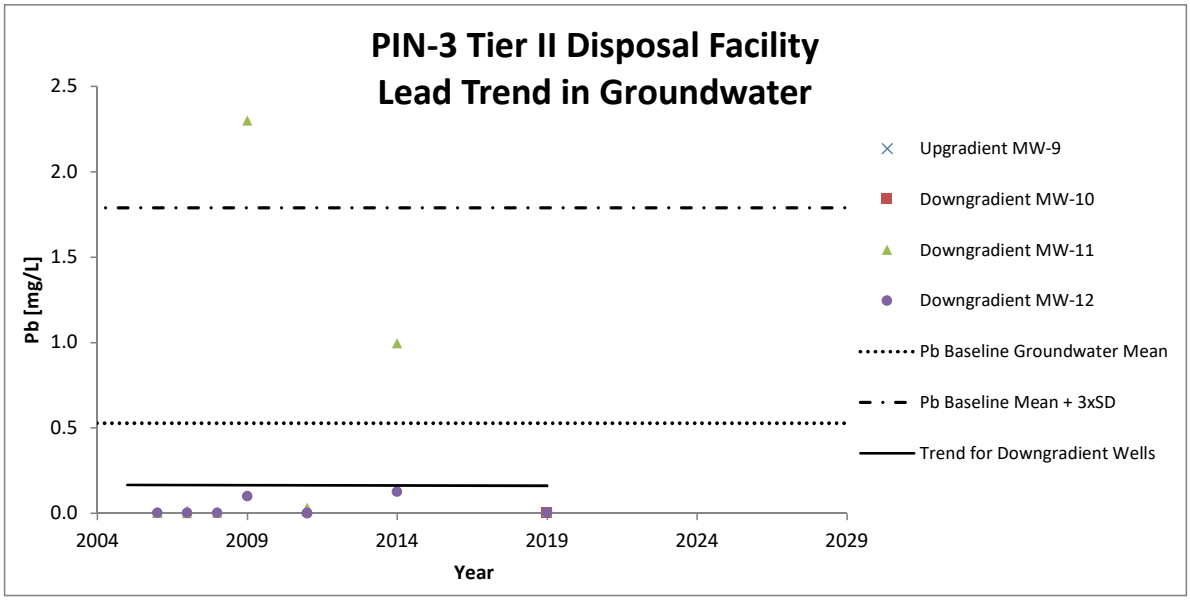
PIN-3 Tier II Disposal Facility Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



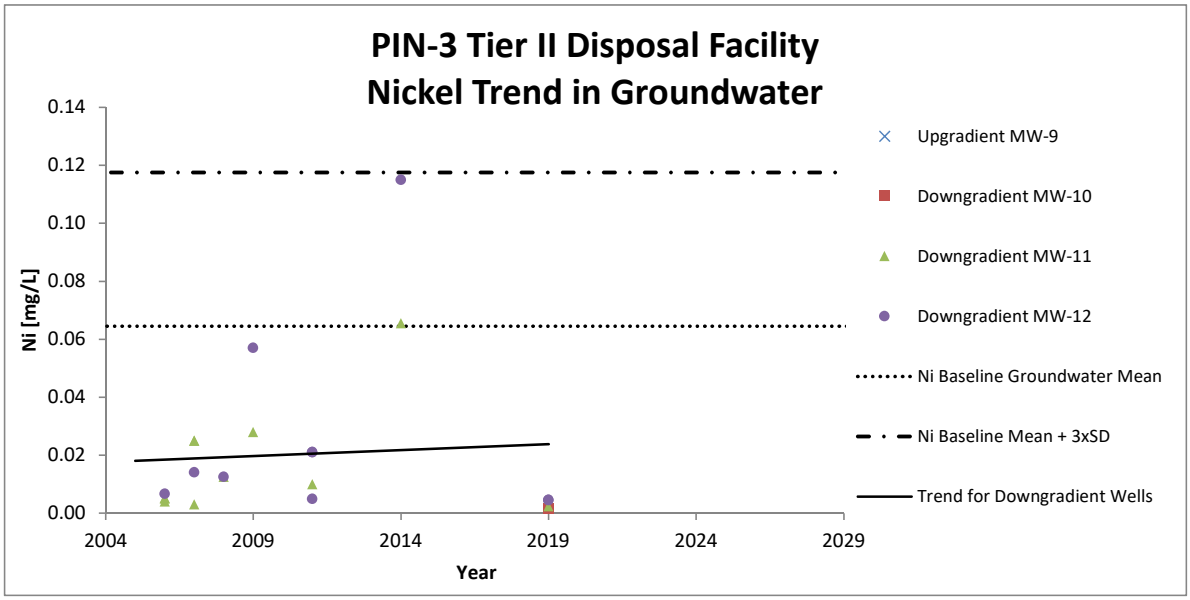


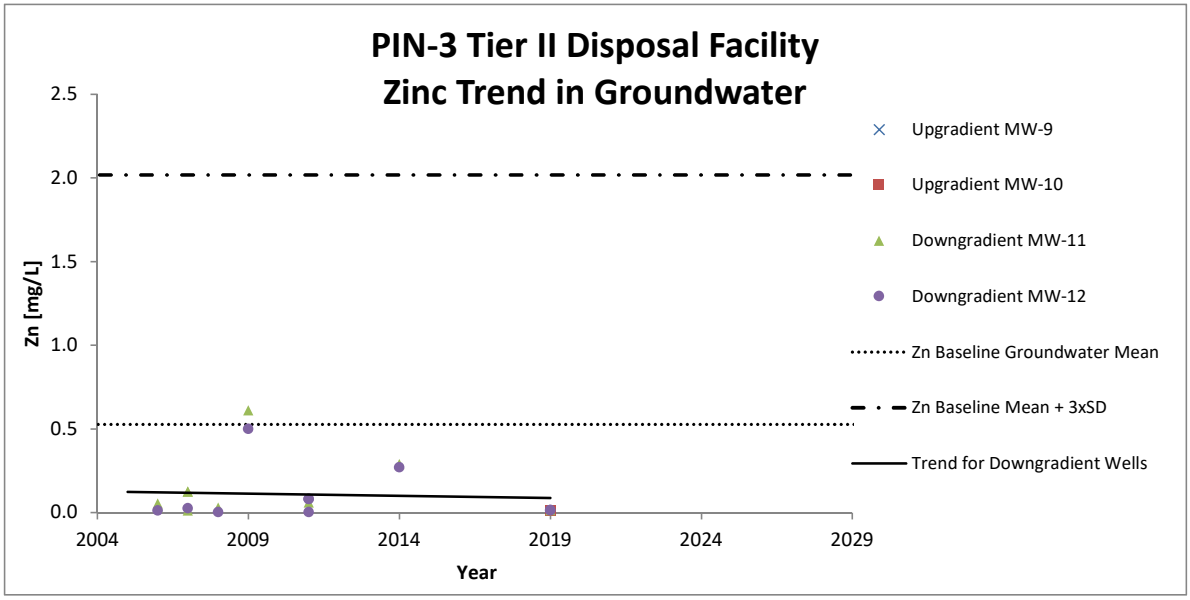
PIN-3 Tier II Disposal Facility Trends in Groundwater Inorganics and PHCs

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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



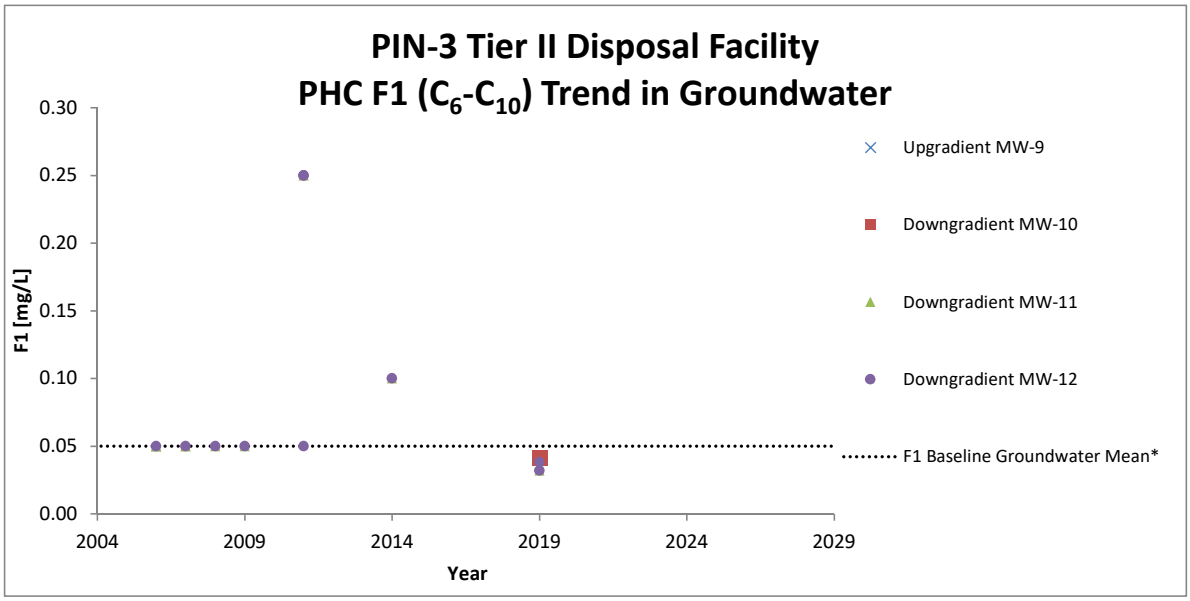


PIN-3 Tier II Disposal Facility Trends in Groundwater Inorganics and PHCs

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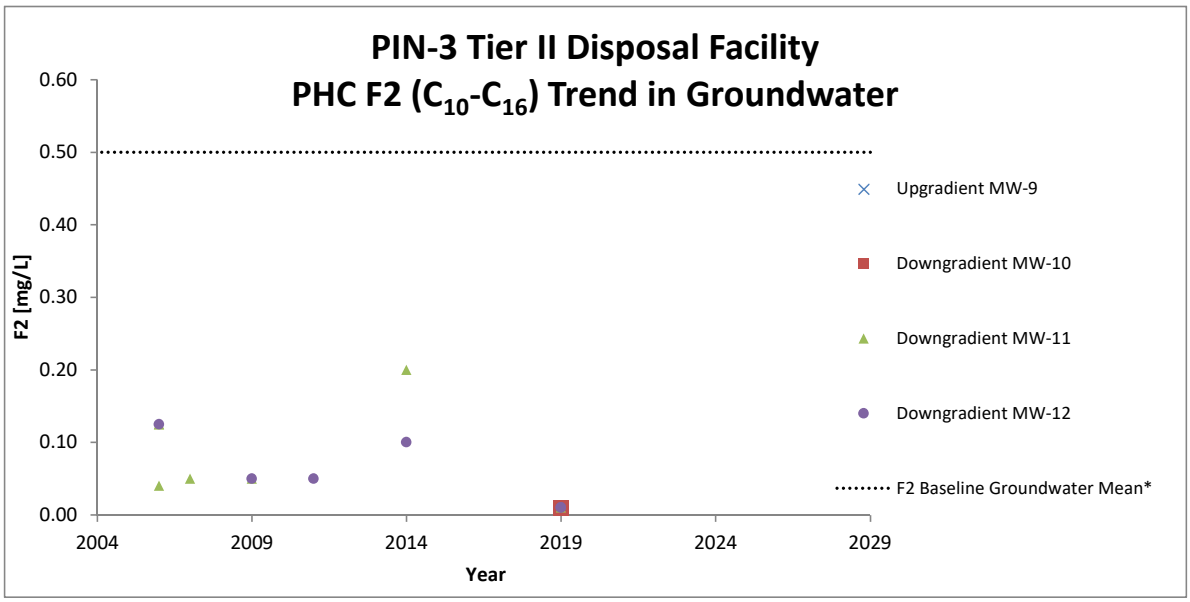
Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the baseline detection limit
* F1 baseline standard deviation = 0

Trend lines not shown for PHC F1 because 7 years of data not available



* F2 baseline arithmetic mean is equal to the baseline detection limit
* F2 baseline standard deviation = 0

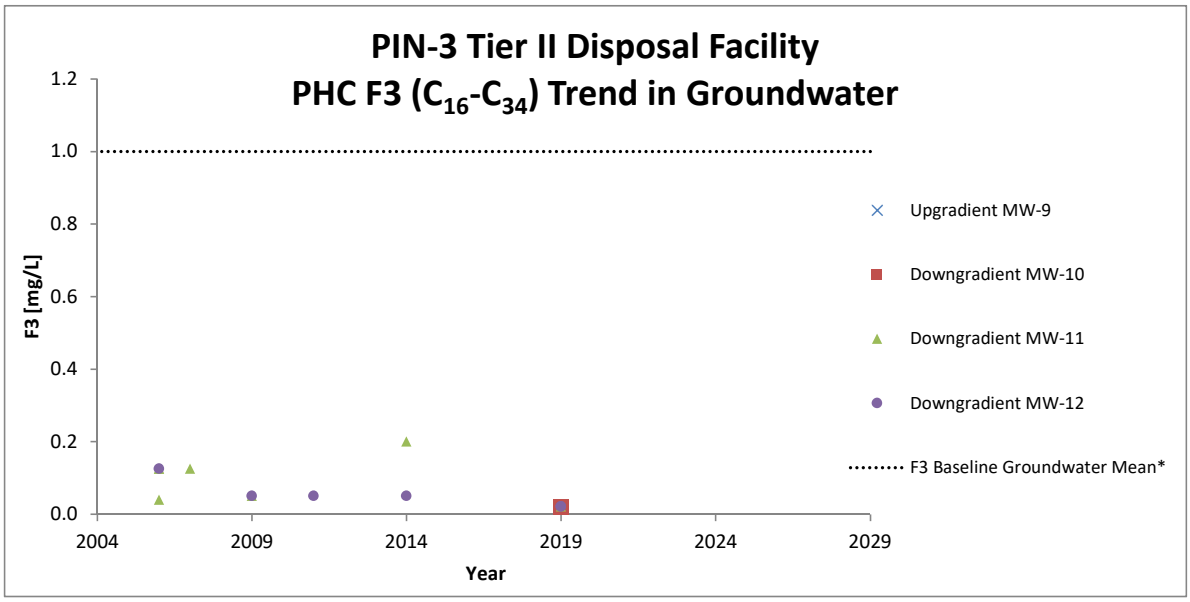
Trend lines not shown for PHC F2 because 7 years of data not available

PIN-3 Tier II Disposal Facility Trends in Groundwater Inorganics and PHCs

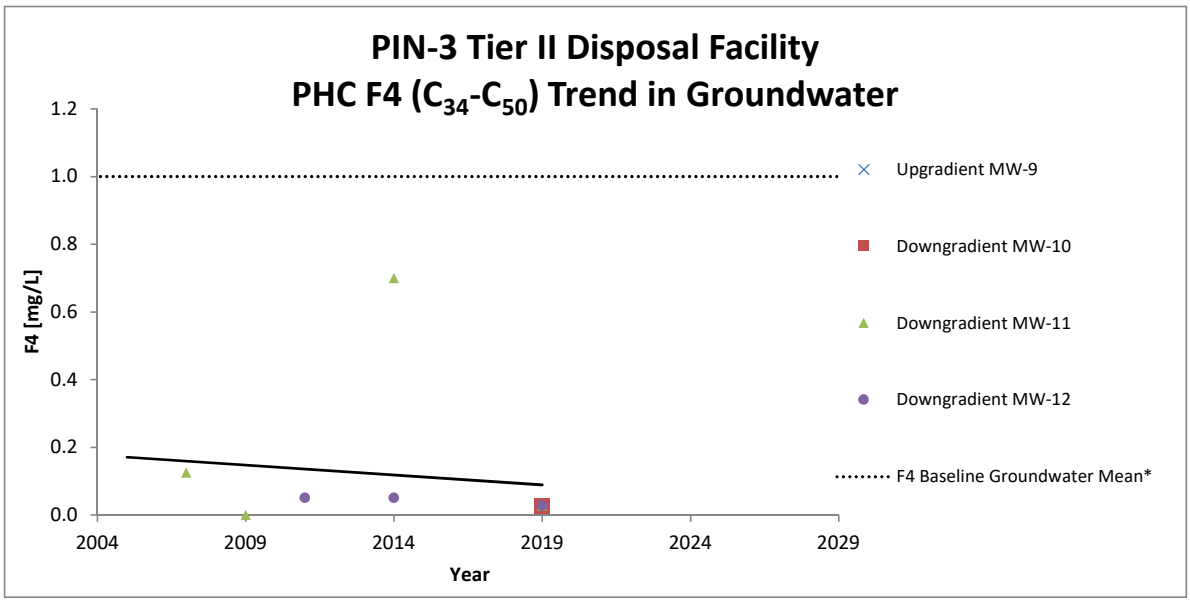
Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the baseline detection limit
* F3 baseline standard deviation = 0
Trend lines not shown for PHC F3 because 7 years of data not available



* F4 baseline arithmetic mean is equal to the baseline detection limit
* F4baseline standard deviation = 0
Trend lines not shown for PHC F4 because 7 years of data not available

APPENDIX I

Site Photographic Logs

APPENDIX I1 - PHOTOGRAPHIC LOG AERIAL PHOTOGRAPHS

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Feature ID	Feature of Note	UTM		Photo Size KB	Date of Photo	Camera Information
					Northing	Easting			
Aerial Photographs									
A1	3.1	east	A1	Airstrip	408218.618	7597480.103	6156	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
A2	3.1	north-northeast	A2	Main Landfill	407784.259	7597195.644	6217	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
A3	3.1	north-northwest	A3	Non-Hazardous Waste Landfill	408947.328	7597215.787	5835	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
A4	3.1	east-northeast	A4	North Landfill	408001.588	7598462.022	6061	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
A5	3.1	south-southwest	A5	NWS Landfill	408153.406	7598354.329	5810	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
A6	3.1	northeast	A6	South Landfill	408566.71	7596197.818	5999	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
A7	3.1	north-northwest	A7	Tier II Soil Diposal Facility	409613.102	7597077.129	6071	2019-08-19	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel

APPENDIX I2 - PHOTOGRAPHIC LOG SAMPLE STATION PHOTOGRAPHS

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Description	UTM		Photo Size (KB)	Date of Photo	Camera Information
						Northing	Easting			
Sample Station Photographs - Main Landfill										
MW-5-1	S1	NA	Sample station MW-5	MW-5	Close-up of test pit	408047.143	7597700.506	6467	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-5-2		south - southwest			Test pit location			6119	2019-08-17	
MW-5-3		NA			Test pit backfilled			6211	2019-08-17	
MW-6-1	S2	NA	Sample station MW-6	MW-6	Close-up of test pit	407846.028	7597727.615	6240	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-6-2		east-northeast			Test pit location			6621	2019-08-17	
MW-6-3		NA			Test pit backfilled			6149	2019-08-17	
MW-7-1	S3	NA	Sample station MW-7	MW-7	Close-up of test pit	407906.529	7597683.776	6332	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-7-2		east-northeast			Test pit location			5861	2019-08-17	
MW-7-3		NA			Test pit backfilled			6263	2019-08-17	
MW-8-1	S4	NA	Sample station MW-8	MW-8	Close-up of test pit	407858.972	7597610.047	6639	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-8-2		east			Test pit location			6659	2019-08-17	
MW-8-3		NA			Test pit backfilled			6519	2019-08-17	
Sample Station Photographs - NWS Landfill										
P3-1-1	S1	NA	Sample Station P3-1	P3-1	Close-up of test pit	408005.339	7598043.893	6459	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-1-2		south-southeast			Test pit location			6167	2019-08-17	
P3-1-3		NA			Test pit backfilled			6556	2019-08-17	
P3-2-1	S2	NA	Sample Station P3-2	P3-2	Close-up of test pit	407910.723	7597930.684	6306	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-2-2		northeast			Test pit location			6599	2019-08-17	
P3-2-3		NA			Test pit backfilled			6320	2019-08-17	
P3-3-1	S3	NA	Sample Station P3-3	P3-3	Close-up of test pit	407874.346	7597995.546	6244	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-3-2		north			Test pit location			6257	2019-08-17	
P3-3-3		NA			Test pit backfilled			6313	2019-08-17	

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Description	UTM		Photo Size (KB)	Date of Photo	Camera Information
						Northing	Easting			
P3-4-1	S4	NA	Sample Station P3-4	P3-4	Close-up of test pit	407805.43	7598054.758	6749	2019-08-17	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-4-2		southeast			Test pit location			6626	2019-08-17	
P3-4-3		NA			Test pit backfilled			6679	2019-08-17	
Sample Station Photographs - South Landfill										
P3-5-1	S1	NA	Sample Station P3-5	P3-5	Close-up of test pit	408686.5	7596530.662	6488	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-5-2		south			Test pit location			6196	2019-08-18	
P3-5-3		NA			Test pit backfilled			6566	2019-08-18	
P3-6-1	S2	NA	Sample Station P3-6	P3-6	Close-up of test pit	408734.215	7596454.522	6236	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-6-2		north			Test pit location			6312	2019-08-18	
P3-6-3		NA			Test pit backfilled			6370	2019-08-18	
P3-7-1	S3	NA	Sample Station P3-7	P3-7	Close-up of test pit	408699.134	7596415.500	6312	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-7-2		north-northwest			Test pit location			6494	2019-08-18	
P3-7-3		NA			Test pit backfilled			6451	2019-08-18	
P3-8-1	S4	NA	Sample Station P3-8	P3-8	Close-up of test pit	408673.310	7596460.418	6521	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-8-2		north-northwest			Test pit location			6471	2019-08-18	
P3-8-3		NA			Test pit backfilled			6521	2019-08-18	
P3-9-1	S5	NA	Sample Station P3-9	P3-8	Close-up of test pit	408857.421	7596509.023	6620	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-9-2		southeast			Test pit location			6497	2019-08-18	
P3-9-3		NA			Test pit backfilled			6601	2019-08-18	
P3-10-1	S6	NA	Sample Station P3-10	P3-9	Close-up of test pit	408849.372	7596413.623	6422	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-10-2		north-northwest			Test pit location			5918	2019-08-18	
P3-10-3		north-northwest			Test pit backfilled			6660	2019-08-18	

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Description	UTM		Photo Size (KB)	Date of Photo	Camera Information
						Northing	Easting			
P3-11-1	S7	NA	Sample Station P3-11	P3-10	Close-up of test pit	408790.213	7596448.043	6706	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-11-2		east			Test pit location			6298	2019-08-18	
P3-11-3		northeast			Test pit backfilled			6408	2019-08-18	
Sample Station Photographs - North Landfill										
P3-12-1	S1	NA	Sample Station P3-12	P3-12	Close-up of test pit	408584.774	7598699.579	6492	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-12-2		north-northwest			Test pit location			6233	2019-08-18	
P3-12-3		NA			Test pit backfilled			6095	2019-08-18	
P3-13-1	S2	NA	Sample Station P3-13	P3-13	Close-up of test pit	408489.248	7598716.58	6448	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-13-2		east			Test pit location			6458	2019-08-18	
P3-13-3		NA			Test pit backfilled			6722	2019-08-18	
P3-14-1	S3	NA	Sample Station P3-14	P3-14	Close-up of test pit	408546.684	7598751.663	6460	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-14-2		southwest			Test pit location			6400	2019-08-18	
P3-14-3		NA			Test pit backfilled			7072	2019-08-18	
P3-15-1	S4	NA	Sample Station P3-15	P3-15	Close-up of test pit	408596.460	7598743.101	6247	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-15-2		south			Test pit location			6426	2019-08-18	
P3-15-3		south			Test pit backfilled			6105	2019-08-18	
P3-16-1	S5	NA	Sample Station P3-16	P3-16	Close-up of test pit	408638.835	7598738.175	6339	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
P3-16-2		south			Test pit location			6473	2019-08-18	
P3-16-3		NA			Test pit backfilled			6502	2019-08-18	
Sample Station Photographs - Non Hazardous Waste Landfill										
MW-13-1	S1	NA	Sample Station MW-13	MW-13	Close-up of test pit	408884.809	7597606.045	6671	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-13-2		southwest			Test pit location			6637	2019-08-18	
MW-13-3		NA			Test pit backfilled			6563	2019-08-18	

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Description	UTM		Photo Size (KB)	Date of Photo	Camera Information
						Northing	Easting			
MW-14-1	S2	NA	Sample Station MW-14	MW-14	Close-up of test pit	408819.433	7597658.136	6689	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-14-2		west-southwest			Test pit location			6532	2019-08-18	
MW-14-3		NA			Test pit backfilled			6203	2019-08-18	
MW-15-1	S3	NA	Sample Station MW-15	MW-15	Close-up of test pit	408762.052	7597584.000	6152	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-15-2		north			Test pit location			5851	2019-08-18	
MW-15-3		NA			Test pit backfilled			6566	2019-08-18	
MW-16-1	S4	NA	Sample Station MW-16	MW-16	Close-up of test pit	408803.541	7597545.210	6361	2019-08-18	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-16-2		north			Test pit location			6476	2019-08-18	
MW-16-3		NA			Test pit backfilled			6777	2019-08-18	
Sample Station Photographs - Tier II Diposal Facility										
MW-9-1	S1	NA	Sample Station MW-9	MW-9	Close-up of test pit	409518.673	7597455.585	6152	2019-08-16	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-9-2		south			Test pit location			6607	2019-08-16	
MW-9-3		NA			Test pit backfilled			6206	2019-08-16	
MW-10-1	S2	NA	Sample Station MW-10	MW-10	Close-up of test pit	409442.281	7597312.161	6201	2019-08-16	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-10-2		northeast			Test pit location			6499	2019-08-16	
MW-10-3		NA			Test pit backfilled			6597	2019-08-16	
MW-11-1	S3	NA	Sample Station MW-11	MW-11	Close-up of test pit	409526.886	7597301.074	6669	2019-08-16	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-11-2		northwest			Test pit location			6240	2019-08-16	
MW-11-3		NA			Test pit backfilled			6629	2019-08-16	
MW-12-1	S4	NA	Sample Station MW-12	MW-12	Close-up of test pit	409600.594	7597304.927	6959	2019-08-16	Panasonic DMC-TS25, Aspect Ratio 4:3, Focal Length 4 -25mm, 15.9 Mpixel
MW-12-2		northwest			Test pit location			6619	2019-08-16	
MW-12-3		NA			Test pit backfilled			6496	2019-08-16	

APPENDIX I3 - PHOTOGRAPHIC LOG VISUAL INSPECTION PHOTOGRAPHS

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
MAIN LANDFILL											
MLF_1	1	W	E of Landfill	MW-5	Monitoring Well	Detail of MW-5	7597695.903	408055.393	4029	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_2	2	E	W of Landfill	MW-6	Monitoring Well	Detail of MW-6	7597730.397	407846.014	3759	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_3	3	E	W of Landfill	MW-7	Monitoring Well	Detail of MW-7	7597685.634	407907.693	3994	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_4	4	NE	W of Landfill	MW-8	Monitoring Well	Detail of MW-8	7597605.275	407867.087	4133	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_5	5	W	E of Landfill	-	Landfill structure	E side of Landfill	7597606.325	408056.325	4252	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_6	6	W	E of Landfill	-	Landfill structure	E side of Landfill	7597660.562	408051.887	4075	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_7	7	W	E of Landfill	-	Landfill structure	E side of Landfill	7597704.619	408049.690	4154	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_8	8	W	E of Landfill	-	Landfill structure	E side of Landfill	7597772.698	408029.869	3634	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_9	9	SE	E toe of Landfill	-	Landfill structure	View down the E slope of Landfill	7597765.620	407977.307	4168	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_10	10	NW	E toe of Landfill	-	Landfill structure	View along N toe of Landfill	7597764.571	407977.737	4109	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_11	11	SE	N point of Landfill	-	Landfill structure	View along N toe of Landfill	7597800.048	407919.267	4159	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_12	12	SW	N point of Landfill	-	Landfill structure	View along N toe of Landfill	7597800.209	407920.719	3997	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_13	13	S	N point of Landfill	G1	Small depression	Detail of Feature G1	7597796.228	407931.404	3576	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_14	14	SE	N point of Landfill	G2	Linear depression	Detail of Feature G2	7597793.094	407929.066	3589	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_15	15	SW	N point of Landfill	G2	Linear depression	Detail of Feature G2	7597795.842	407934.955	3367	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_16	16	NE	NW point of Landfill	-	Landfill structure	View along N toe of Landfill	7597760.788	407875.323	4152	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_17	17	S	NW point of Landfill	-	Landfill structure	View along W toe of Landfill	7597760.839	407875.552	4213	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_18	18	E	NW point of Landfill	L	Minor erosion	Detail of Feature L	7597758.561	407871.252	4108	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_19	19	NW	NW point of Landfill	L	Minor erosion	Detail of Feature L	7597754.995	407879.828	4071	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_20	20	NE	W toe of Landfill	-	Landfill structure	View along W toe of Landfill	7597729.867	407862.346	4325	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_21	21	SE	W toe of Landfill	-	Landfill structure	View along W toe of Landfill	7597730.308	407862.635	4113	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_22	22	NW	W toe of Landfill	-	Landfill structure	View along W toe of Landfill	7597700.145	407922.083	4198	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_23	23	NE	W toe of Landfill	F	Minor erosion	Detail of Feature F	7597697.676	407916.806	4217	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_24	24	SW	W crest of Landfill	F	Minor erosion	Detail of Feature F	7597718.158	407927.281	4214	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_25	25	N	W midslope of Landfill	F	Minor erosion	Detail of Feature F	7597706.506	407923.516	4092	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_26	26	SE	W crest of Landfill	H	Small depression	Detail of Feature H	7597707.162	407933.740	3632	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_27	27	SW	W crest of Landfill	E	Minor erosion	Detail of Feature E	7597698.552	407941.284	4350	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_28	28	SW	W crest of Landfill	E	Minor erosion	Detail of Feature E	7597693.632	407943.220	4217	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_29	29	E	W toe of Landfill	E	Minor erosion	Detail of Feature E	7597684.772	407924.914	4278	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_30	30	NE	W of Landfill	-	Landfill structure	View of W side of Landfill	7597654.289	407865.694	3589	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_31	31	NE	W toe of Landfill	-	Landfill structure	View along W toe of Landfill	7597645.200	407885.414	4026	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_32	32	S	W toe of Landfill	-	Landfill structure	View along W toe of Landfill	7597645.923	407886.570	4300	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_33	33	N	SW point of Landfill, at toe	-	Landfill structure	View along W toe of Landfill	7597596.104	407883.034	4234	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_34	34	E	SW point of Landfill, at toe	-	Landfill structure	View along S toe of Landfill	7597596.632	407883.258	4232	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_35	35	NE	SW point of Landfill, at toe	I1	Depression	Detail of Feature I1	7597597.176	407882.880	4193	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
MLF_36	36	N	SW point of Landfill, at toe	I1	Depression	Detail of Feature I1	7597593.521	407889.834	4336	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_37	37	N	SW point of Landfill, midslope	I2	Small depression	Detail of Feature I2	7597606.941	407893.447	4326	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_38	38	S	E crest of Landfill	-	Landfill structure	View along E crest of Landfill	7597682.710	407994.546	3975	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_39	39	N	E crest of Landfill	-	Landfill structure	View along E crest of Landfill	7597682.948	407994.305	4071	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_40	40	W	E crest of Landfill	-	Landfill structure	View across Landfill cap	7597685.595	407994.181	4153	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_41	41	NW	Central Landfill cap	VT-1	Thermistor	Detail of VT-1	7597685.595	407994.181	4332	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_42	42	NW	Central Landfill cap	A	Depressed area	Detail of Feature A	7597721.967	407969.413	4020	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_43	43	SE	E crest of Landfill	-	Landfill structure	View along W crest of Landfill	7597759.399	407967.701	4312	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_44	44	NW	E crest of Landfill	-	Landfill structure	View along N crest of Landfill	7597758.985	407967.424	4098	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_45	45	S	N crest of Landfill	-	Landfill structure	View south across Landfill cap	7597767.531	407955.590	4093	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_46	46	SE	N crest of Landfill	-	Landfill structure	View along N crest of Landfill	7597787.743	407920.316	4133	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_47	47	SW	N crest of Landfill	-	Landfill structure	View along N crest of Landfill	7597787.518	407920.998	4174	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_48	48	S	W crest of Landfill	VT-2	Thermistor	Detail of VT-2	7597738.643	407877.471	4350	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_49	49	SE	W crest of Landfill	-	Landfill structure	View along W crest of Landfill	7597733.263	407879.152	4110	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_50	50	N	W crest of Landfill	-	Landfill structure	View across Landfill cap	7597663.355	407935.402	4161	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_51	51	SW	W crest of Landfill	-	Landfill structure	View along W crest of Landfill	7597663.870	407935.902	4285	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_52	52	NW	W crest of Landfill	D	Minor erosion	Detail of Feature D	7597662.137	407936.900	4297	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_53	53	SE	W crest of Landfill	D	Minor erosion	Detail of Feature D	7597669.000	407929.196	4339	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_54	54	NE	W side of Landfill, midslope	-	Landfill structure	View along W crest of Landfill	7597638.108	407899.987	4216	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_54a	54a	E	W side of Landfill, midslope	O2, O3	ATV tracks	Detail of Feature O2 and O3	7597668.595	407930.516	4226	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_55	55	S	W crest of Landfill	-	Landfill structure	View along W crest of Landfill	7597638.425	407898.962	4065	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_56	56	N	W crest of Landfill	-	Landfill structure	View across the inner slope (elbow) of Landfill	7597632.284	407901.858	4092	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_57	57	W	W crest of Landfill	M	Minor erosion	Detail of Feature M	7597633.705	407900.146	4161	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_58	58	E	W side of Landfill, midslope	M	Minor erosion	Detail of Feature M	7597634.821	407888.646	4281	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_59	59	NW	W crest of Landfill	VT-4	Thermistor	Detail of VT-4	7597620.267	407901.626	4009	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_60	60	E	W side of Landfill, midslope	O1	ATV tracks	Detail of O1	7597619.651	407892.924	4105	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_61	61	N	SW point of Landfill, at crest	-	Landfill structure	View along W crest of Landfill	7597609.535	407897.483	4345	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_62	62	E	SW point of Landfill, at crest	-	Landfill structure	View along S crest of Landfill	7597609.270	407897.748	4291	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_63	63	W	S crest of Landfill	J1	Small depression	Detail of Feature J1	7597610.134	407910.001	4273	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_64	64	NE	S side of Landfill, midslope	J2	Depression	Detail of Feature J2	7597605.560	407922.774	4020	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_65	65	E	S crest of Landfill	J3	Depression	Detail of Feature J3	7597613.643	407943.633	3590	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_66	66	N	S side of Landfill, midslope	O5	ATV tracks	Detail of Feature O5	7597608.201	407942.995	4147	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_67	67	W	S crest of Landfill	-	Landfill structure	View along S crest of Landfill	7597613.240	407954.422	4218	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_68	68	SE	S crest of Landfill	-	Landfill structure	View along S crest of Landfill	7597613.911	407953.359	4225	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_69	69	S	S crest of Landfill	C	Minor erosion	Detail of Feature C	7597613.820	407954.379	4299	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_70	70	N	S toe of Landfill	C	Minor erosion	Detail of Feature C	7597597.250	407949.160	4067	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
MLF_71	71	W	S toe of Landfill	-	Landfill structure	View along S toe of Landfill	7597597.930	407950.363	4151	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_72	72	SE	S toe of Landfill	-	Landfill structure	View along S toe of Landfill	7597599.360	407948.319	4094	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_73	73	N	S crest of Landfill	-	Landfill structure	View across Landfill cap	7597614.248	407954.254	3598	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_74	74	W	Central Landfill cap	VT-3	Thermistor	Detail of VT-3	7597637.900	407969.101	4213	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_75	75	SW	Central Landfill cap	B	Small depression	Detail of Feature B	7597638.118	407966.259	4240	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_76	76	NW	SE point of Landfill at crest	-	Landfill structure	View along S crest of Landfill	7597583.451	407978.218	4035	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_77	77	NE	SE point of Landfill at crest	-	Landfill structure	View along E crest of Landfill	7597566.388	407985.932	3920	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_78	78	NW	SE point of Landfill at toe	-	Landfill structure	View along S toe of Landfill	7597570.796	407972.955	4086	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_79	79	NE	SE point of Landfill at toe	-	Landfill structure	View along E toe of Landfill	7597566.388	407985.932	4240	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_80	80	NW	W of Landfill	N	Lack of feature	Area shot of Feature N's listed location	7597598.990	408009.134	4141	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_81	81	NE	E crest of Landfill	K	Linear depression	Detail of Feature K	7597618.422	407996.344	4101	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_82	82	NW	E side of Landfill, midslope	K	Linear depression	Detail of Feature K	7597618.422	407996.344	4119	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_83	83	NW	E crest of Landfill	-	Landfill structure	View across Landfill cap	7597620.885	407993.579	3579	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
MLF_84	84	N	E toe of Landfill	P	Sparse vegetation	Area shot of Feature P	7597670.422	408011.369	4102	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
						NWS LANDFILL					
NWS_1	1	W - N	SE point of E lobe	-	Landfill structure	Panoramic shot of E lobe	7597969.631	408055.934	1356	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_2	2	S - W	NE point of E lobe	-	Landfill structure	Panoramic shot of E lobe	7598021.030	408038.887	1334	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_3	3	E	N point of E lobe	-	Landfill structure	View along N toe of Landfill	7598032.280	407988.418	4201	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_4	4	SW	N point of E lobe	-	Landfill structure	View along N toe of Landfill	7598034.099	407986.872	4247	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_5	5	SE	N point of E lobe	B1	Minor depression	Detail of Feature B1	7598034.424	407989.453	3487	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_6	6	NE	NW point of E lobe	-	Landfill structure	View along N toe of Landfill	7598007.699	407949.412	4015	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_7	7	S	NW point of E lobe	-	Landfill structure	View along W toe of Landfill	7598008.466	407946.335	4339	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_8	8	S	NW point of E lobe	B2	Minor depression	Detail of Feature B2	7598009.540	407949.075	4288	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_9	9	NW	W side of E lobe	A	Ponded water	Detail of Feature A	7597976.567	407939.664	4257	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_10	10	SW	W side of E lobe	A	Ponded water	Detail of Feature A	7597986.439	407940.590	4052	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_11	11	NW	S point of E lobe	-	Landfill structure	View along S toe of Landfill	7597953.655	407994.132	4119	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_12	12	E	S point of E lobe	-	Landfill structure	View along S toe of Landfill	7597954.293	407993.730	4142	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_13	13	E	E side of Central lobe	A	Ponded water	Detail of Feature A	7597983.185	407928.954	4155	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_14	14	W	SE point of Central lobe	-	Landfill structure	View along S toe of Landfill	7597985.912	407929.225	4231	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_15	15	N	SE point of Central lobe	-	Landfill structure	View along E toe of Landfill	7597986.393	407927.559	4218	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_16	16	N	Between E and Central lobes	C	Minor erosion	Detail of Feature C	7597981.422	407937.286	4059	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_17	17	S	NE point of Central lobe	-	Landfill structure	View along E toe of Landfill	7598015.860	407933.766	4231	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_18	18	NW	NE point of Central lobe	-	Landfill structure	View along N toe of Landfill	7598014.797	407933.917	4255	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_19	19	SE	NW point of Central lobe	-	Landfill structure	View along N toe of Landfill	7598043.787	407889.243	4063	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_20	20	S	NW point of Central lobe	-	Landfill structure	View along W toe of Landfill	7598044.336	407886.193	4053	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_21	21	N	SW point of Central lobe	-	Landfill structure	View along W toe of Landfill	7597988.851	407880.832	4339	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_22	22	E	SW point of Central lobe	-	Landfill structure	View along S toe of Landfill	7597988.662	407882.435	4229	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_23	23	N - E	SW point of Central lobe	-	Landfill structure	Panoramic shot of Central lobe	7597989.073	407882.375	4305	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_24	24	N	S of Central lobe	-	Landfill structure	S side of Central lobe	7597968.472	407890.759	4144	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_25	25	NW	SE point of W lobe	-	Landfill structure	View along S toe of Landfill	7598027.564	407876.641	4044	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_26	26	N	SE point of W lobe	-	Landfill structure	View along E toe of Landfill	7598027.995	407877.749	4215	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_27	27	SW	NE point of W lobe	-	Landfill structure	View across Landfill cap	7598077.467	407875.173	3984	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_28	28	NE	N side of W lobe	-	Landfill structure	Roughly graded area along N side of W lobe and beyond	7598070.742	407837.812	4025	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_29	29	NE	NW point of W lobe	-	Landfill structure	View along N toe of Landfill	7598063.243	407824.112	4006	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_30	30	S	NW point of W lobe	-	Landfill structure	View along W toe of Landfill	7598064.437	407824.088	4353	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_31	31	E	SW point of W lobe	-	Landfill structure	View along S toe of Landfill	7598042.634	407829.590	4216	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NWS_32	32	SE	Central lobe cap	E	Equipment tracks	Detail of Feature E	7598030.400	407891.505	4235	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
						SOUTH LANDFILL					
SLF_1	1	S	NE of E lobe	L	Exposed debris	Detail of Feature L	7596492.012	408871.660	4327	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_2	2	SW	N point of E lobe	-	Landfill stucture	View along N toe of Landfill	7596512.054	408827.555	4247	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_3	3	SE	N point of E lobe	-	Landfill stucture	View along N toe of Landfill	7596511.004	408826.494	3922	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_4	4	NW	NE toe of Landfill	-	Landfill stucture	View along N toe of Landfill	7596494.799	408862.179	4133	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_5	5	SE	NE toe of Landfill	-	Landfill stucture	View along N toe of Landfill	7596496.809	408859.881	3959	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_6	6	NW	W point of E lobe	-	Landfill stucture	View along N toe of Landfill	7596470.012	408886.630	3606	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_7	7	S	W point of E lobe	-	Landfill stucture	View along E toe of Landfill	7596471.626	408888.039	4029	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_8	8	S	NE of E lobe	K	Orange staining	Detail of Feature K	7596481.756	408887.656	3595	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_9	9	NE	SE point of E lobe	-	Landfill stucture	View along E toe of Landfill	7596434.433	408874.900	3622	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_10	10	SW	SE point of E lobe	-	Landfill stucture	View along S toe of Landfill	7596435.448	408875.135	4168	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_11	11	NW	E of E lobe	K	Orange staining	Detail of Feature K	7596446.146	408892.060	3665	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_12	12	E	E side of E lobe cap	K	Orange staining	Detail of Feature K	7596453.765	408873.946	3890	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_13	13	SE	SE point of E lobe	M1	Ponded water	Detail of Feature M1	7596442.259	408875.358	3763	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_14	14	SW - NE	SE point of E lobe	-	Landfill stucture	Panoramic shot of E lobe	7596439.474	408871.985	1351	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_15	15	SW	S side of E lobe cap	I	Depressed area	Detail of Feature I	7596444.472	408860.375	2653	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_16	16	NW	N side of E lobe cap	J1	Small depression	Detail of Feature J1	7596481.677	408867.604	4091	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_17	17	N	S of E lobe	C, M2	Ponded water, Orange staining	Detail of Features C, M2	7596416.380	408853.559	3604	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_18	18	E	S side of E lobe	C, M2	Ponded water, Orange staining	Detail of Features C, M2	7596430.490	408845.719	3907	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_19	19	S	S side of E lobe	C, M2	Ponded water, Orange staining	Detail of Features C, M2	7596437.421	408857.180	3883	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_20	20	NW	S of E lobe	-	Landfill stucture	View of E lobe	7596408.496	408872.244	4216	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_21	21	N	S of E lobe	-	Landfill stucture	View of E lobe	7596392.346	408851.132	3643	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_22	22	E	SW point of E lobe	-	Landfill stucture	View along S toe of Landfill	7596423.072	408825.886	3679	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_23	23	NW	SW point of E lobe	-	Landfill stucture	View along W toe of Landfill	7596422.505	408826.140	3893	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_24	24	SE	W of E lobe	J2	Linear depression	Detail of Feature J2	7596452.112	408806.146	3621	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_25	25	SW	W side of E lobe	M3, M4	Ponded water	Detail of Features M3, M4	7596466.338	408812.314	4028	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_26	26	S	NW point of E lobe	-	Landfill stucture	View along W toe of Landfill	7596504.982	408808.921	3594	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_27	27	SW - SE	NW point of E lobe	-	Landfill stucture	Panoramic shot of E lobe	7596511.474	408817.274	1328	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_28	28	SE	NW point of E lobe	O	Sparse vegetation	Detail of Feature O	7596506.498	408815.881	4077	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_29	29	SE	W of E lobe	M3, M4	Ponded water	Detail of Features M3, M4	7596459.629	408790.359	3702	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_30	30	NW	SE of SW lobe	-	Landfill stucture	View of SW lobe	7596425.105	408725.100	3999	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_31	31	SW	E of SW lobe	G	Exposed debris	Detail of Feature G	7596444.410	408732.656	3576	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_32	32	W	E of SW lobe	G	Exposed debris	Detail of Feature G with SW lobe in frame	7596442.478	408739.069	3638	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_33	33	NW	E of SW lobe	-	Landfill stucture	View of NW lobe	7596449.274	408730.169	3591	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_34	34	NE	E side of NW lobe	H	Exposed debris	Detail of Feature H	7596477.919	408731.355	4335	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_35	35	NW	E of NW lobe	-	Landfill stucture	View of NW lobe	7596474.998	408757.075	3581	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SLF_36	36	SE	E side of NW lobe	B	Orange staining	Detail of Feature B	7596494.175	408728.259	4156	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_37	37	E	E of NW lobe	M5, M6, B	Ponded water, Orange staining	Detail of Features M5, M6, B	7596485.209	408736.015	4287	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_38	38	SW	E of NW lobe	M5, M6, B	Ponded water, Orange staining	Detail of Features M5, M6, B	7596491.851	408745.873	4253	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_39	39	S	NE point of NW lobe	-	Landfill stucture	View along E toe of Landfill	7596511.210	408740.786	4219	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_40	40	W	NE point of NW lobe	-	Landfill stucture	View along N toe of Landfill	7596511.091	408740.296	3912	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_41	41	S - NW	NE point of NW lobe	-	Landfill stucture	Panoramic shot of NW lobe	7596508.042	408733.885	1355	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_42	42	W	N of NW lobe	M7	Ponded water	Detail of Feature M7	7596517.085	408718.986	3665	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_43	43	E	N of NW lobe	M7	Ponded water	Detail of Feature M7	7596515.736	408687.566	3575	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_44	44	NE	NW point of NW lobe	-	Landfill stucture	View along N toe of Landfill	7596501.750	408665.122	4318	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_45	45	SE	NW point of NW lobe	-	Landfill stucture	View along W toe of Landfill	7596501.659	408663.763	4068	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_46	46	E - S	NW point of NW lobe	-	Landfill stucture	Panoramic shot of NW lobe	7596500.133	408664.988	1340	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_47	47	SW	W side of NW lobe cap	A	Orange staining	Detail of Feature A	7596495.287	408678.212	2672	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_48	48	NE	W of NW lobe	-	Landfill stucture	View of NW lobe	7596468.860	408653.494	3596	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_49	49	N	S of SW lobe	-	Landfill stucture	View of SW lobe	7596417.582	408702.037	4106	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
SLF_50	50	W	E of SW lobe	N	Exposed debris	Detail of Feature N	7596445.761	408724.760	4071	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
						NORTH LANDFILL					
NLF_1	1	SW	NE of E lobe	-	Landfill structure	NE side of E lobe	7598727.441	408651.219	3903	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_2	2	NW	SE of E lobe	-	Landfill structure	SE side of E lobe	7598677.949	408645.227	3598	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_3	3	NE	SW of E lobe	-	Landfill structure	SW side of E lobe	7598679.454	408621.754	3622	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_4	4	NW	SE of Central lobe	-	Landfill structure	SE side of Central lobe	7598696.122	408617.550	3943	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_5	5	E - N	SW point of E lobe	-	Landfill structure	Panoramic view of E lobe	7598689.770	408629.057	1326	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_6	6	S	NW point of E lobe	A	Linear depression	Detail of Feature A	7598718.093	408625.634	4128	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_7	7	W	E lobe cap	A	Linear depression	Detail of Feature A	7598713.480	408629.745	4091	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_8	8	SW	NE of Central lobe	-	Landfill structure	NE side of Central lobe	7598728.027	408615.908	4108	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_9	9	SE	NW of Central lobe	-	Landfill structure	NW side of Central lobe	7598732.389	408580.246	3866	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_10	10	NE	SW of Central lobe	-	Landfill structure	SW side of Central lobe	7598695.162	408585.583	4182	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_11	11	NW	SE of W lobe	-	Landfill structure	SE side of W lobe	7598685.783	408576.048	2554	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_12	12	NW	W point of W lobe	-	Landfill structure	View along NE toe of Landfill	7598716.541	408568.801	3817	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_13	13	SW	W point of W lobe	-	Landfill structure	View along SE toe of Landfill	7598714.403	408570.077	4134	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_14	14	NE	SE crest of W lobe, midpoint	-	Landfill structure	View along SE toe of Landfill	7598695.734	408529.500	4210	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_15	15	SW	SE crest of W lobe, midpoint	-	Landfill structure	View along SE toe of Landfill	7598695.741	408530.160	3974	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_16	16	SE	W lobe Landfill cap	C	Minor erosion	Detail of Feature C	7598687.863	408511.521	3609	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_17	17	NE	S point of W lobe	-	Landfill structure	View along SE toe of Landfill	7598673.100	408499.823	4344	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_18	18	NW	S point of W lobe	-	Landfill structure	View along SW toe of Landfill	7598669.927	408500.817	4124	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_19	19	NW	S point of W lobe	B	Minor depression	Detail of Feature B	7598673.534	408502.460	4166	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_20	20	NE	W lobe Landfill cap	D	Equipment tracks	Detail of Feature D	7598684.806	408508.031	4273	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_21	21	SE	W lobe Landfill cap	D	Equipment tracks	Detail of Feature D	7598697.158	408509.966	4043	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_22	22	SE	N point of W lobe	-	Landfill structure	View along NE toe of Landfill	7598739.567	408547.177	3898	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_23	23	SW	N point of W lobe	-	Landfill structure	View along NW toe of Landfill	7598738.232	408546.372	4345	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_24	24	NE	NW crest of W lobe, midpoint	-	Landfill structure	View along NW toe of Landfill	7598715.229	408518.119	4082	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_25	25	SW	NW crest of W lobe, midpoint	-	Landfill structure	View along NW toe of Landfill	7598715.436	408518.613	4211	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_26	26	SE	NW of W lobe	E	Sparse vegetation	Detail of Feature E	7598715.566	408512.660	4294	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_27	27	NE	Centre of W lobe	-	Landfill structure	View across Landfill cap	7598701.777	408523.031	4086	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NLF_28	28	SW	Centre of W lobe	-	Landfill structure	View across Landfill cap	7598701.767	408523.477	4162	18-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
NON-HAZARDOUS WASTE LANDFILL											
NHLF_1	1	E	SW corner of Landfill, at toe	-	Landfill structure	View along S toe of Landfill	7597562.918	408769.920	4053	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_2	2	N	SW corner of Landfill, at toe	-	Landfill structure	View along W toe of Landfill	7597562.411	408770.094	4167	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_3	3	NE	SW corner of Landfill, at toe	F	Minor erosion	Detail of Feature F	7597566.636	408769.883	4283	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_4	4	SE	SW corner of Landfill, midslope	F	Minor erosion	Detail of Feature F	7597571.710	408772.728	4195	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_5	5	E	SW corner of Landfill, at crest	-	Landfill structure	View along S crest of Landfill	7597571.905	408776.737	4344	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_6	6	N	SW corner of Landfill, at crest	-	Landfill structure	View along W crest of Landfill	7597571.791	408777.187	4027	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_7	7	NE	SW corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597572.769	408777.057	3783	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_8	8	SW	SW corner of Landfill, at crest	F	Minor erosion	Detail of Feature F	7597572.889	408778.820	4085	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_9	9	N	SW area of Landfill cap	E	Rough grading	Detail of Feature E	7597577.766	408794.747	4118	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_10	10	W	SW area of Landfill cap	E	Rough grading	Detail of Feature E	7597583.995	408798.303	4329	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_11	11	N	SW area of Landfill cap	C2	Small depression	Detail of Feature C2	7597580.008	408808.268	3577	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_12	12	W	SW area of Landfill cap	C2	Small depression	Detail of Feature C2	7597582.551	408812.428	4251	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_13	13	N	SW area of Landfill cap	C1	Small depression	Detail of Feature C1	7597572.772	408819.716	3605	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_14	14	W	SW area of Landfill cap	C1	Small depression	Detail of Feature C1	7597577.417	408825.812	4217	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_15	15	W	SE corner of Landfill, at crest	-	Landfill structure	View along S crest of Landfill	7597571.476	408862.469	4320	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_16	16	N	SE corner of Landfill, at crest	-	Landfill structure	View along E crest of Landfill	7597571.706	408862.681	4188	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_17	17	NW	SE corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597572.172	408862.803	2442	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_18	18	W	SE corner of Landfill, at toe	-	Landfill structure	View along S toe of Landfill	7597565.298	408868.867	4210	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_19	19	N	SE corner of Landfill, at toe	-	Landfill structure	View along E toe of Landfill	7597566.718	408868.070	4107	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_20	20	NW	SE corner of Landfill, at toe	B	Exposed liner	Detail of Feature B	7597576.769	408870.214	4130	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_21	21	NW	SE corner of Landfill, at toe	G	Minor erosion	Detail of Feature G	7597562.487	408866.349	4121	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_22	22	N	E of Landfill	MW-13	Monitoring well	Detail of MW-13	7597593.212	408879.947	3591	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_23	23	NW	E of Landfill	-	Landfill structure	View of E side of Landfill	7597579.280	408909.139	4153	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_24	24	S	NE corner of Landfill, at toe	-	Landfill structure	View along E toe of Landfill	7597637.909	408874.692	4269	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_25	25	W	NE corner of Landfill, at toe	-	Landfill structure	View along N toe of Landfill	7597636.724	408875.394	4072	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_26	26	S	NE corner of Landfill, at crest	-	Landfill structure	View along E crest of Landfill	7597627.553	408862.931	4203	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_27	27	W	NE corner of Landfill, at crest	-	Landfill structure	View along N crest of Landfill	7597627.087	408863.187	3887	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_28	28	SW	NE corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597627.273	408863.225	4009	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_29	29	N	Central Landfill cap	-	Sparse vegetation	View of previously noted location of sparse vegetation	7597610.594	408842.894	4134	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_30	30	E	NW corner of Landfill, at toe	-	Landfill structure	View along N toe of Landfill	7597644.226	408768.010	4235	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_31	31	S	NW corner of Landfill, at toe	-	Landfill structure	View along W toe of Landfill	7597643.697	408767.295	4192	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_32	32	E	NW corner of Landfill, at crest	-	Landfill structure	View along N crest of Landfill	7597629.716	408778.620	4215	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_33	33	S	NW corner of Landfill, at crest	-	Landfill structure	View along W crest of Landfill	7597630.526	408779.231	4058	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_34	34	SE	NW corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597630.256	408777.968	4173	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_35	35	W	W crest of Landfill	H2	Minor erosion	Detail of Feature H2	7597592.613	408778.925	3618	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
NHLF_36	36	E	W side of Landfill, midslope	H2	Minor erosion	Detail of Feature H2	7597592.217	408771.110	4159	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_37	37	W	W crest of Landfill	H3	Minor erosion	Detail of Feature H3	7597581.494	408779.342	4306	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_38	38	E	W side of Landfill, midslope	H3	Minor erosion	Detail of Feature H3	7597580.197	408768.267	4230	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_39	39	E	W side of Landfill, midslope	H1	Minor erosion	Detail of Feature H1	7597603.454	408772.646	4230	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_40	40	SE	N crest of Landfill	K	Rough grading	Detail of Feature K	7597629.116	408797.850	4218	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_41	41	E	W of Landfill	MW-15	Monitoring well	Detail of MW-15	7597591.879	408755.608	4138	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_42	42	E	Central Landfill cap	K	Rough grading	Detail of Feature K	7597604.368	408804.465	4101	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_43	43	S	Central Landfill cap	K	Rough grading	Detail of Feature K	7597617.491	408817.657	4180	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_44	44	NW	Central Landfill cap	K	Rough grading	Detail of Feature K	7597593.704	408849.009	3850	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_45	45	S	Central Landfill cap	D1	Small depression	Detail of Feature D1	7597612.049	408839.720	4197	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_46	46	S	N of Landfill	J	ATV tracks	Detail of Feature J	7597645.106	408806.142	4052	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
NHLF_47	47	S	Landfill cap, NW corner	D2	Small depression	Detail of Feature D2	7597621.506	408786.396	4276	17-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
						TIER II LANDFILL					
T2LF_1	1	S	N of Landfill	MW-9	Monitoring well	Detail of MW-9	7597452.663	409520.421	4033	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_2	2	E	NW corner of Landfill, at toe	-	Landfill structure	View along N toe of Landfill	7597428.875	409465.582	4023	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_3	3	S	NW corner of Landfill, at toe	-	Landfill structure	View along W toe of Landfill	7597429.673	409466.058	4198	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_4	4	E	NW corner of Landfill, at crest	-	Landfill structure	View along N toe of Landfill	7597409.413	409481.446	4018	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_5	5	S	NW corner of Landfill, at crest	-	Landfill structure	View along W toe of Landfill	7597409.639	409481.611	4041	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_6	6	SE	NW corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597409.663	409481.401	3812	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_7	7	SW	NW corner of Landfill, midslope	E1	Small depression	Detail of Feature E1	7597413.365	409479.507	4122	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_8	8	NE	NW corner of Landfill, midslope	E1	Small depression	Detail of Feature E1	7597411.088	409472.993	4030	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_9	9	W	W crest of Landfill	J1, J2	Minor erosion	Detail of Features J1, J2	7597397.952	409481.802	4155	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_10	10	E	W side of Landfill, midslope	J1, J2	Minor erosion	Detail of Features J1, J2	7597397.394	409459.914	4213	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_11	11	E	W side of Landfill, midslope	J3	Minor erosion	Detail of Feature J1	7597385.694	409457.217	4198	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_12	12	E	W side of Landfill, midslope	I1	Minor erosion	Detail of Feature I1	7597376.742	409468.822	4056	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_13	13	W	W crest of Landfill	I1	Minor erosion	Detail of Feature I1	7597375.962	409481.055	4145	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_14	14	N	SW corner of Landfill, at crest	-	Landfill structure	View along W crest of Landfill	7597351.944	409481.022	4053	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_15	15	E	SW corner of Landfill, at crest	-	Landfill structure	View along S crest of Landfill	7597352.241	409480.876	4143	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_16	16	NE	SW corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597351.837	409481.492	3831	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_17	17	S	SW corner of Landfill, at crest	B1	Small depression	Detail of Feature B1	7597353.804	409483.579	4040	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_18	18	W	SW corner of Landfill, at crest	B1	Small depression	Detail of Feature B1	7597349.541	409485.551	4184	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_19	19	NE	SW corner of Landfill, at toe	I2	Minor erosion	Detail of Feature I2	7597331.682	409458.833	4278	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_20	20	N	SW corner of Landfill, at toe	-	Landfill structure	View along W toe of Landfill	7597332.216	409459.429	4245	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_21	21	E	SW corner of Landfill, at toe	-	Landfill structure	View along S toe of Landfill	7597333.825	409461.407	4331	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_22	22	NE	SW of Landfill	MW-10	Monitoring well	Detail of MW-10	7597312.379	409443.258	3606	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_23	23	N	S of Landfill	-	Landfill structure	View of S side of Landfill	7597271.119	409521.017	3932	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_24	24	N	S of Landfill	-	Former drainage channel	View of former drainage channel along S toe of Landfill	7597305.220	409529.841	3711	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_25	25	W	SE corner of Landfill, at toe	-	Landfill structure	View along S toe of Landfill	7597321.874	409596.354	4111	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_26	26	N	SE corner of Landfill, at toe	-	Landfill structure	View along E toe of Landfill	7597321.906	409594.475	4050	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_27	27	NW	SE corner of Landfill, at toe	G1	Minor erosion	Detail of Feature G1	7597318.424	409590.459	4071	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_28	28	SE	SE corner of Landfill, midslope	G1	Minor erosion	Detail of Feature G1	7597333.793	409577.660	4088	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_29	29	S	SE corner of Landfill, at crest	G2	Minor erosion	Detail of Feature G2	7597344.490	409573.293	4318	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_30	30	W	SE corner of Landfill, at crest	-	Landfill structure	View along S crest of Landfill	7597349.929	409569.913	4146	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_31	31	N	SE corner of Landfill, at crest	-	Landfill structure	View along E crest of Landfill	7597349.263	409569.847	3970	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_32	32	NW	SE corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597350.413	409569.404	3959	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_33	33	W	S crest of Landfill	VT-8	Thermistor	Detail of VT-8	7597350.681	409551.155	4059	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_34	34	N	S side of Landfill, midslope	C1	Small depression	Detail of Feature C1	7597336.221	409546.754	4276	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_35	35	S	S crest of Landfill	H1	Minor erosion	Detail of Feature H1	7597351.282	409548.846	4200	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

Appendix I: PIN-3 Photographic Log 2019

Photo ID	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
T2LF_36	36	N	S side of Landfill, midslope	C2	Small depression	Detail of Feature C2	7597347.370	409536.821	3673	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_37	37	S	S crest of Landfill	H3	Minor erosion	Detail of Feature H3	7597351.922	409528.043	4162	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_38	38	S	S crest of Landfill	H4	Minor erosion	Detail of Feature H4	7597351.697	409524.797	4135	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_39	39	E	S crest of Landfill	VT-7	Thermistor	Detail of VT-7	7597352.294	409502.213	4031	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_40	40	SE	S crest of Landfill	B2	Small depression	Detail of Feature B2	7597351.363	409504.381	4225	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_41	41	S	S crest of Landfill	B2	Small depression	Detail of Feature B2	7597354.735	409509.102	4278	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_42	42	N	Landfill cap, SW corner	K	Sparse vegetation	Detail of Feature K	7597360.287	409487.051	4084	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_43	43	SE	E crest of Landfill	G3, G4	Minor erosion	Detail of Features G3, G4	7597367.886	409568.187	4217	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_44	44	NW	E side of Landfill, midslope	G3, G4	Minor erosion	Detail of Features G3, G4	7597353.714	409574.520	4059	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_45	45	W	E side of Landfill, midslope	D1	Small depression	Detail of Feature D1	7597368.495	409577.228	4347	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_46	46	S	E crest of Landfill	-	Uneven crest	View of the uneven area of E crest	7597400.606	409572.933	4037	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_47	47	S	E crest of Landfill	D2	Small depression	Detail of Feature D2	7597394.060	409570.630	4061	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_48	48	W	E crest of Landfill	D2	Small depression	Detail of Feature D2	7597389.247	409575.606	4098	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_49	49	S	NE corner of Landfill, at crest	-	Landfill structure	View along E crest of Landfill	7597409.024	409571.802	4294	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_50	50	W	NE corner of Landfill, at crest	-	Landfill structure	View along N crest of Landfill	7597408.964	409571.707	4063	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_51	51	SW	NE corner of Landfill, at crest	-	Landfill structure	View across Landfill cap	7597409.954	409571.441	4173	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_52	52	E	NE corner of Landfill, at crest	F2	Minor erosion	Detail of Feature F2	7597403.290	409570.049	4225	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_53	53	S	NE corner of Landfill, at toe	-	Landfill structure	View along E toe of Landfill	7597430.988	409592.158	4192	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_54	54	W	NE corner of Landfill, at toe	-	Landfill structure	View along N toe of Landfill	7597429.495	409587.764	4092	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_55	55	SW	NE corner of Landfill, at toe	F1	Minor erosion	Detail of Feature F1	7597425.798	409591.492	4081	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_56	56	W	N crest of Landfill	VT-6	Thermistor	Detail of VT-6	7597408.929	409549.553	4114	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_57	57	N	N crest of Landfill	A	Small depression	Detail of Feature A	7597408.913	409549.551	4113	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_58	58	S	Central Landfill cap	C3	Depression	Detail of Feature C3	7597395.013	409541.857	4324	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_59	59	W	Central Landfill cap	C3	Depression	Detail of Feature C3	7597388.300	409547.726	4112	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_60	60	E	N crest of Landfill	VT-5	Thermistor	Detail of Feature VT-5	7597409.091	409502.149	4157	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_61	61	NE	N crest of Landfill	E2	Small depression	Detail of Feature E2	7597411.129	409510.346	4258	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_62	62	E	N crest of Landfill	E3	Small depression	Detail of Feature E3	7597410.209	409511.589	4313	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_63	63	N	W side of Landfill, midslope	K	Sparse vegetation	Representative photo of sparse vegetation	7597363.903	409474.617	4223	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP
T2LF_64	64	E	W toe of Landfill	K	Sparse vegetation	Representative photo of sparse vegetation	7597375.281	409443.306	4191	16-Aug-19	Fujifilm Finepix XP130 Aspect Ratio 4:3, Focal Length 5 to 25mm, 16.4 MP

APPENDIX I4
SELECT SITE PHOTOGRAPHS

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_8

Date:
17 August 2019

Description:
View of E side of landfill. VT-1 visible at top.



Photo: PIN-3 MLF_9

Date:
17 August 2019

Description:
View along E toe of landfill. Shows slope, transition to native and adjacent access road. Hangar building visible in background.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_12

Date:
17 August 2019

Description:
View along N toe of Landfill, shows side slope. Note hunting camp and cabins on the shoreline visible in the background.



Photo: PIN-3 MLF_15

Date:
17 August 2019

Description:
View of Feature G2, depression.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_17

Date:
17 August 2019

Description:
View along W toe of landfill, shows slope, transition and surrounding vegetation. VT-2 visible on top of landfill, MW-06 and shoreline in background.



Photo: PIN-3 MLF_18

Date:
17 August 2019

Description:
View of Feature L, minor erosion. Typical of such features.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019

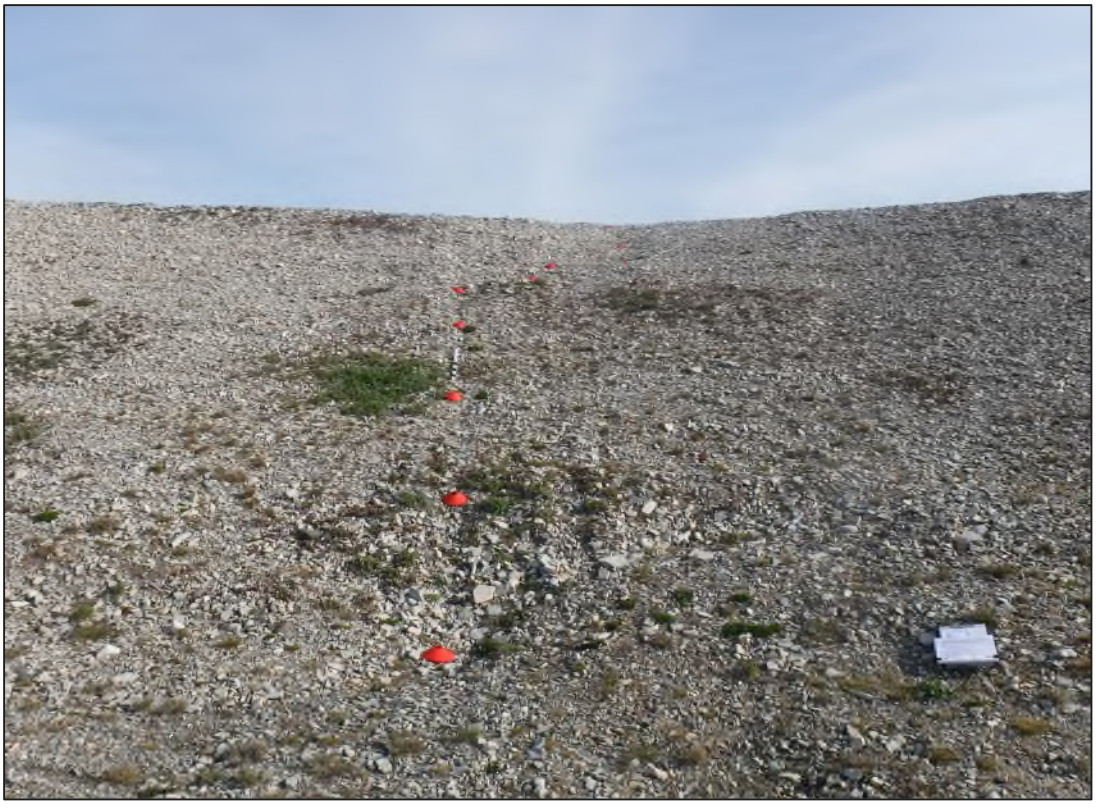


Photo: PIN-3 MLF_23

Date:
17 August 2019

Description:
View of Feature F, larger erosion feature. Relatively unique in that it is not a straight linear feature.



Photo: PIN-3 MLF_26

Date:
17 August 2019

Description:
View of Feature O4. Tracks made by ATVs cresting the slope of the landfill. Typical of such features.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_28

Date:
17 August 2019

Description:
View of Feature E, minor erosion channel. MW-07 visible in background. MW with four angle iron markers is typical of MW installations at this site.



Photo: PIN-3 MLF_30

Date:
17 August 2019

Description:
View of W side of landfill, shows inside banked surface of landfill. Bedrock outcrop showing orientation of shelf underlying landfill is visible at the left of the frame.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_35

Date:
17 August 2019

Description:
View of Feature I1, depressed area. Configuration could be due to equipment track marks.



Photo: PIN-3 MLF_37

Date:
17 August 2019

Description:
View of Feature I2, minor depression.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_40

Date:

17 August 2019

Description:

View across landfill cap, shows cover material and condition. Hunt camp on shoreline visible in the background.



Photo: PIN-3 MLF_41

Date:

17 August 2019

Description:

View of VT-1. Typical of thermistor installations at this site.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_47

Date:
17 August 2019

Description:
View along N crest of landfill. Shows slope transition and typical vegetation present on slope.



Photo: PIN-3 MLF_54

Date:
17 August 2019

Description:
View along inside (W) crest of landfill. Shows interior crest configuration and typical vegetation on slopes/cap.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_58

Date:
17 August 2019

Description:
View of Feature M, minor erosion channel.



Photo: PIN-3 MLF_60

Date:
17 August 2019

Description:
View of Feature O1, tracks made by ATVs as they crest the slope.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_64

Date:
17 August 2019

Description:
View of Feature J2, depressed area. Relatively large in area but shallow depth.



Photo: PIN-3 MLF_70

Date:
17 August 2019

Description:
View of Features C1, C2, C3. Three minor erosion gullies meeting at base of landfill.

Project Photographs

PIN-3 Select Site Photographs
Main Landfill – 17 August 2019



Photo: PIN-3 MLF_74

Date:
17 August 2019

Description:
View of VT-3, with minor depression (Feature B) and ATV tracks in location.



Photo: PIN-3 MLF_79

Date:
17 August 2019

Description:
View along E toe of landfill. Shows typical slope and transition, and vegetation on this section of slope.

Project Photographs

PIN-3 Select Site Photographs
NWS Landfill – 17 August 2019



Photo: PIN-3 NWS_1

Date:
17 August 2019

Description:
Panoramic view of across East Lobe. Shows cover material and condition. Hangar building, hunting camp and shoreline visible in the background.



Photo: PIN-3 NWS_3

Date:
17 August 2019

Description:
View along N toe of East Lobe. Shows typical grading of cover. Station area visible in the background.

Project Photographs

PIN-3 Select Site Photographs
NWS Landfill – 17 August 2019



Photo: PIN-3 NWS_5

Date:
17 August 2019

Description:
View Feature B1, minor settlement. Appears to be fines infiltration.



Photo: PIN-3 NWS_8

Date:
17 August 2019

Description:
View of Feature B2, depression.

Project Photographs

PIN-3 Select Site Photographs
NWS Landfill – 17 August 2019



Photo: PIN-3 NWS_10

Date:
17 August 2019

Description:
View of Feature A, ponded water.



Photo: PIN-3 NWS_16

Date:
17 August 2019

Description:
View of Feature C, minor erosion channel leading to ponded water.

Project Photographs

PIN-3 Select Site Photographs
NWS Landfill – 17 August 2019



Photo: PIN-3 NWS_18

Date:
17 August 2019

Description:
View of N side of Central Lobe. Side slopes are very gradual and transition from structure to native material is difficult to identify; typical of this landfill.



Photo: PIN-3 NWS_3

Date:
17 August 2019

Description:
Panoramic view of Central Lobe. Shows gentle side slopes, cover material and condition.

Project Photographs

PIN-3 Select Site Photographs
NWS Landfill – 17 August 2019



Photo: PIN-3 NWS_26

Date:
17 August 2019

Description:
View of E side of West Lobe. Shows side slope and transition to native material.



Photo: PIN-3 NWS_27

Date:
17 August 2019

Description:
View across N side of West Lobe. Note rough grading, gentle slope and uncertain transition area. Difficult to discern crest and toe.

Project Photographs

PIN-3 Select Site Photographs
NWS Landfill – 17 August 2019



Photo: PIN-3 NWS_31

Date:
17 August 2019

Description:
View of S side of West Lobe. Crest and toe more readily apparent than on N side.



Photo: PIN-3 NWS_32

Date:
17 August 2019

Description:
View of Feature E, vehicle ruts on Central Lobe.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_1

Date:
18 August 2019

Description:
View of Feature L, partially buried drum.



Photo: PIN-3 SLF_5

Date:
18 August 2019

Description:
View along E toe of East Lobe. Shows cover material and condition. Side slopes and transition to low-lying, vegetated surrounding terrain. Shoreline visible in the background.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019

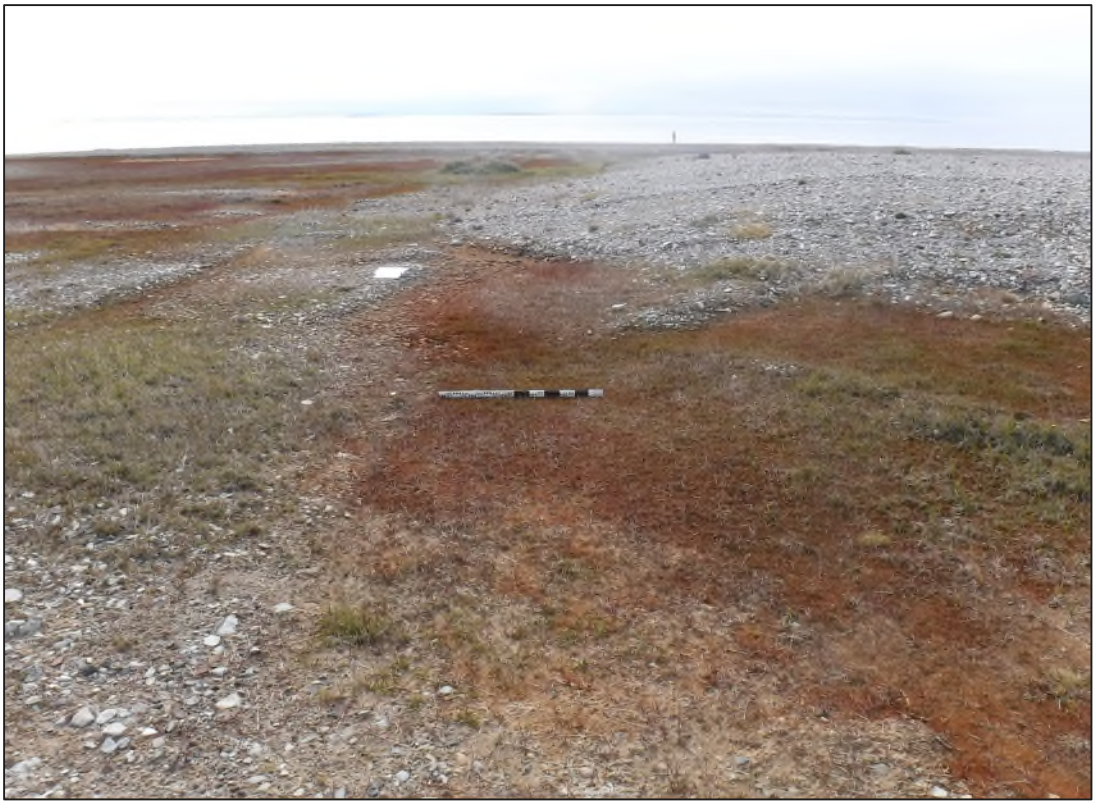


Photo: PIN-3 SLF_8

Date:
18 August 2019

Description:
View of Feature K, orange staining. This orange staining is prevalent in the surrounding area, as can be seen in the background.



Photo: PIN-3 SLF_10

Date:
18 August 2019

Description:
View along S toe of East Lobe. Feature C (orange staining) and Feature M@ (ponded water) visible.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_13

Date:
18 August 2019

Description:
View of Feature M1. Surrounding low-lying terrain and shoreline visible in the background.



Photo: PIN-3 SLF_14

Date:
18 August 2019

Description:
Panoramic view of East Lobe. Shows cover material and condition.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_15

Date:
18 August 2019

Description:
View of Feature I, depressed area.



Photo: PIN-3 SLF_19

Date:
18 August 2019

Description:
View of Feature C (orange staining) and M2 (ponded water) Construction grading relics and access road visible in the background.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_21

Date:
18 August 2019

Description:
View of East Lobe. Access road in foreground.



Photo: PIN-3 SLF_24

Date:
18 August 2019

Description:
View of Feature J2, combination of equipment track marks and settling.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019

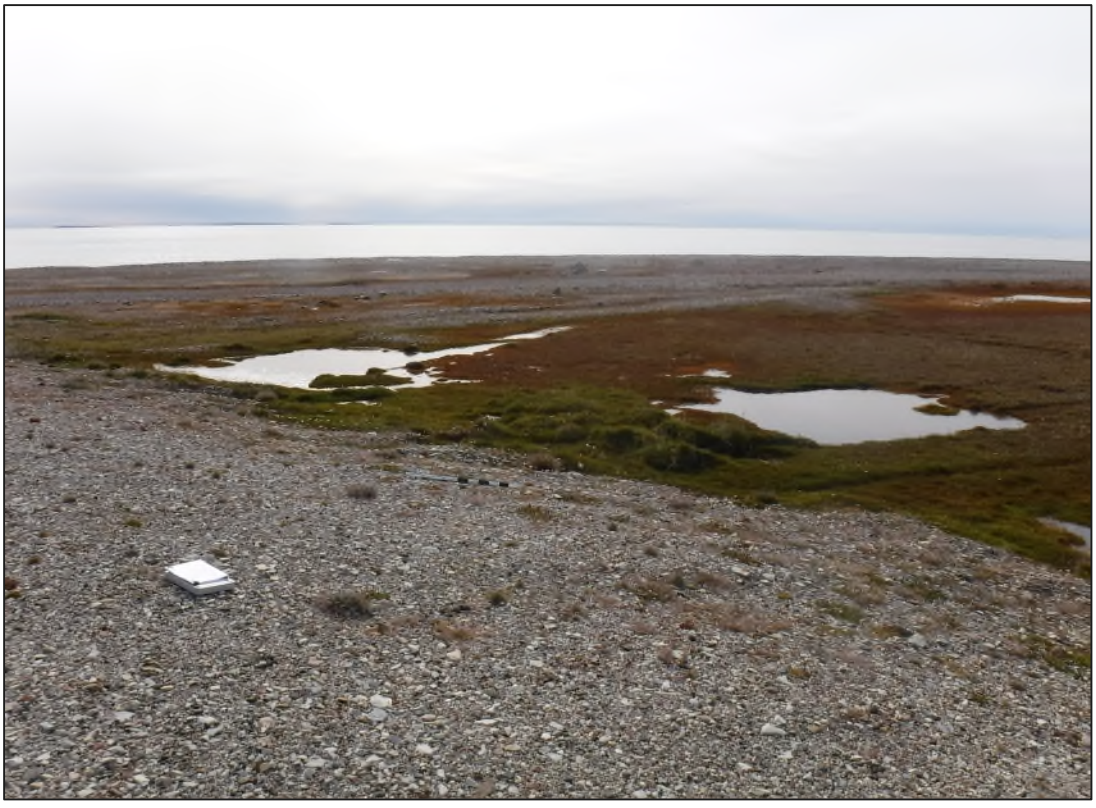


Photo: PIN-3 SLF_25

Date:
18 August 2019

Description:
View of Features M3 and M4, ponded water.



Photo: PIN-3 SLF_28

Date:
18 August 2019

Description:
View of typical sparse vegetation on cap.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_30

Date:
18 August 2019

Description:
View of Southwest Lobe. Small with gradual slopes.

Part of Northwest Lobe and shore tanks visible in the background.



Photo: PIN-3 SLF_31

Date:
18 August 2019

Description:
View of Feature G. Typical of partially exposed debris found on site.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_33

Date:
18 August 2019

Description:
View of Northwest Lobe. Gradual slopes and surrounding vegetation.



Photo: PIN-3 SLF_34

Date:
18 August 2019

Description:
View of Feature H, debris at surface (removed). Typical of surficial debris present in the area.

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_36

Date:
18 August 2019

Description:
View of Feature M5, M6 (ponded water) and Feature B (orange staining).
East Lobe visible in the background.



Photo: PIN-3 SLF_37

Date:
18 August 2019

Description:
Close-up of Feature B (orange staining).

Project Photographs

PIN-3 Select Site Photographs
South Landfill – 18 August 2019



Photo: PIN-3 SLF_42

Date:
18 August 2019

Description:
View along N toe of Northwest Lobe. Shows slope and transition to native material.

Feature M7 (ponded water) also visible.

Shore tanks visible in background.



Photo: PIN-3 SLF_48

Date:
18 August 2019

Description:
View of Northwest Lobe. Shows condition and surrounding area on the W side of landfill.

Project Photographs

PIN-3 Select Site Photographs
North Landfill – 18 August 2019



Photo: PIN-3 NLF_3

Date:
18 August 2019

Description:
View of East Lobe. Shows W and S sides, cover material, condition, grading and surrounding area.



Photo: PIN-3 NLF_6

Date:
18 August 2019

Description:
View of Feature A, minor depression.

Project Photographs

PIN-3 Select Site Photographs
North Landfill – 18 August 2019



Photo: PIN-3 NLF_10

Date:
18 August 2019

Description:
View of Central Lobe. Shows S and W sides, slopes and transition to surrounding material, cover grading, material and condition.



Photo: PIN-3 NLF_11

Date:
18 August 2019

Description:
View of SE side of West Lobe. Surrounding vegetation and material.

Project Photographs

PIN-3 Select Site Photographs
North Landfill – 18 August 2019



Photo: PIN-3 NLF_13

Date:
18 August 2019

Description:
View along S toe of West Lobe. Shows grading and side slope.



Photo: PIN-3 NLF_16

Date:
18 August 2019

Description:
View of Feature C, minor erosion.

Project Photographs

PIN-3 Select Site Photographs
North Landfill – 18 August 2019



Photo: PIN-3 NLF_19

Date:
18 August 2019

Description:
View of Feature B, minor settlement.



Photo: PIN-3 NLF_20

Date:
18 August 2019

Description:
View of Feature D, equipment tracks.

Project Photographs

PIN-3 Select Site Photographs
North Landfill – 18 August 2019



Photo: PIN-3 NLF_27

Date:
18 August 2019

Description:
View of West Lobe, looking E from centre.



Photo: PIN-3 NLF_28

Date:
18 August 2019

Description:
View of West Lobe, looking W from centre.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_1

Date:

17 August 2019

Description:

View along S toe of landfill. Typical slope and transition to surrounding area.

MW-16 visible S of toe. Four angle iron markers typical of MW installations at this site.



Photo: PIN-3 NHLF_2

Date:

17 August 2019

Description:

View along W toe of landfill. Access road visible to the west of toe. Station area visible in the background.

MW-15 visible W of toe. Four angle iron markers typical of MW installations at this site.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_8

Date:
17 August 2019

Description:
View of Feature F, minor settlement. Configuration suggests combination of ATV tracks and settling.

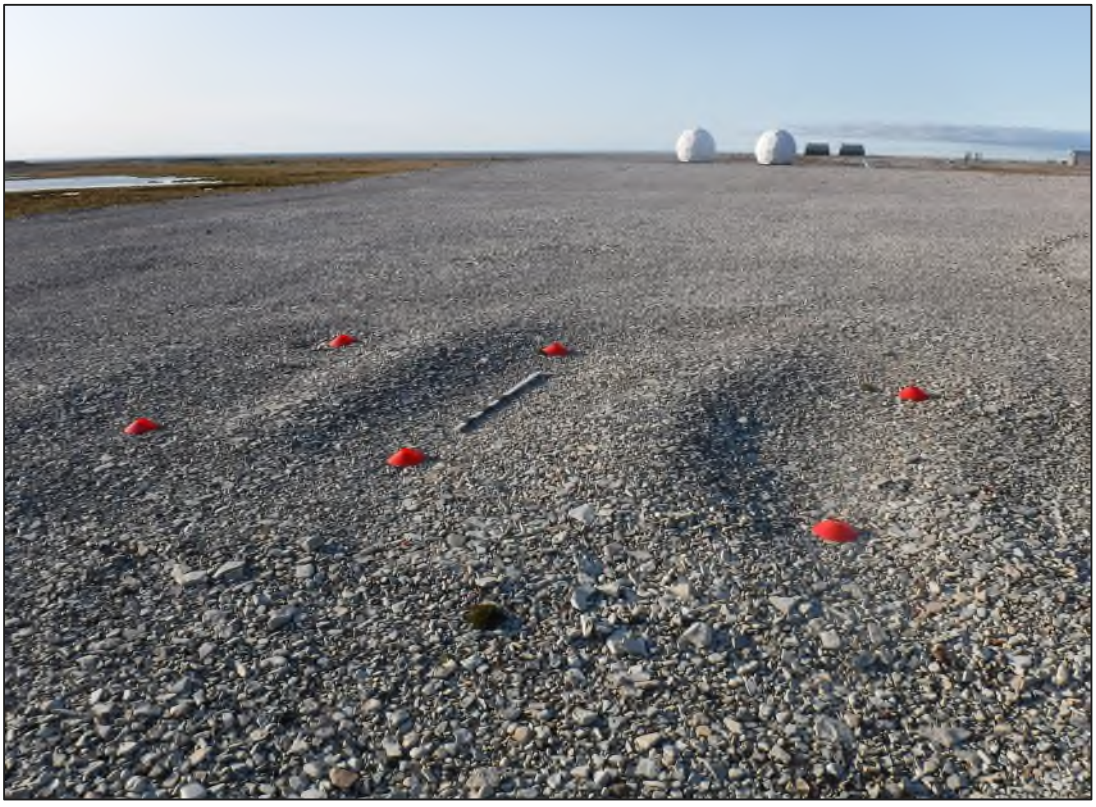


Photo: PIN-3 NHLF_9

Date:
17 August 2019

Description:
View of Feature E, depressions. Configuration suggests a combination of equipment tracks and settling.

Also shows landfill cap and Station area in the background.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_14

Date:
17 August 2019

Description:
View of Feature C2, linear depression. Typical of depressions found on landfill cap.



Photo: PIN-3 NHLF_15

Date:
17 August 2019

Description:
View along S crest of landfill. Hangar building visible in background.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_16

Date:

17 August 2019

Description:

View along E crest of landfill. Shows slope, surrounding area.

Station area visible in background.



Photo: PIN-3 NHLF_17

Date:

17 August 2019

Description:

View across landfill cap. Shows cover material and condition.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_20

Date:
17 August 2019

Description:
View of Feature B, HDPE liner exposed.

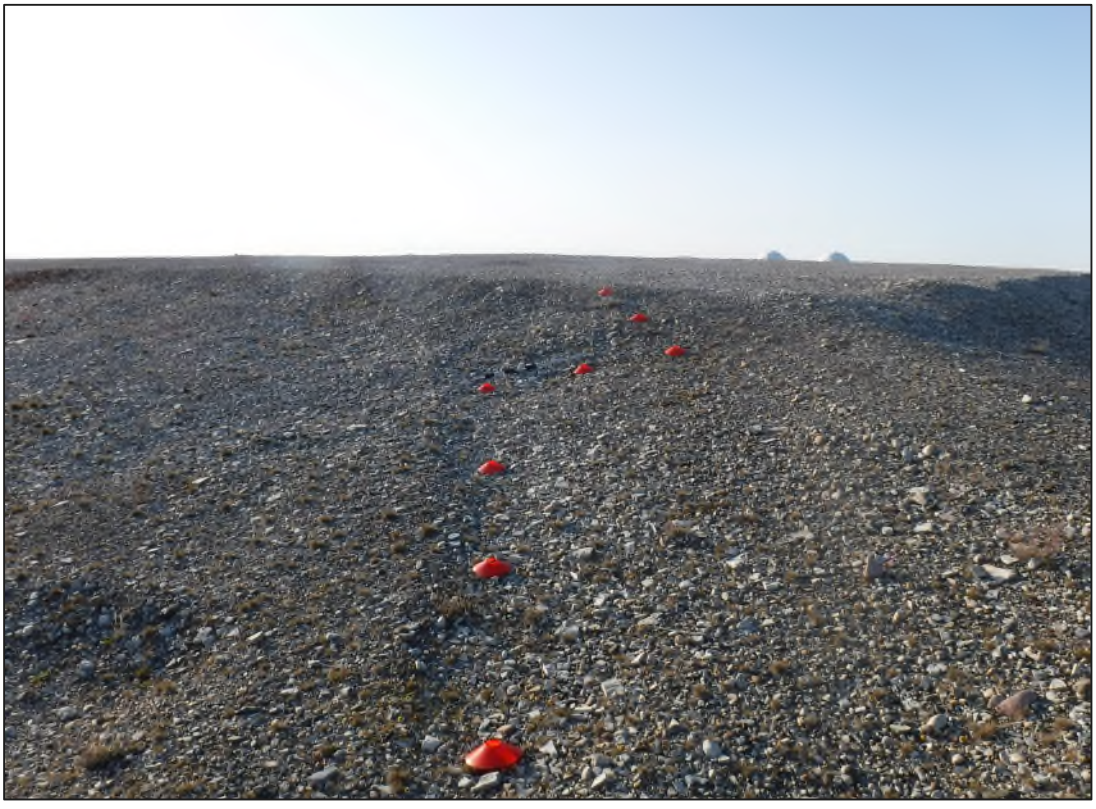


Photo: PIN-3 NHLF_21

Date:
17 August 2019

Description:
View of up SE corner slope (has been graded as access road).

Also shows Feature G, minor erosion channel.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_22

Date:
17 August 2019

Description:
View of MW-13. Typical MW installation at site.
BM-3 visible in background.



Photo: PIN-3 NHLF_23

Date:
17 August 2019

Description:
View of entire landfill E side.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_29

Date:
17 August 2019

Description:
View of area formerly noted as vegetated on cap. Vegetated area not observed in 2019 apart from this small spot.



Photo: PIN-3 NHLF_35

Date:
17 August 2019

Description:
View of Feature H, minor erosion. Typical of such features on site.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019



Photo: PIN-3 NHLF_40

Date:
17 August 2019

Description:
View of bulldozer blade marks on cap. Tracks and blade pattern visible.

Designated as 'regrade area' in previous reports.

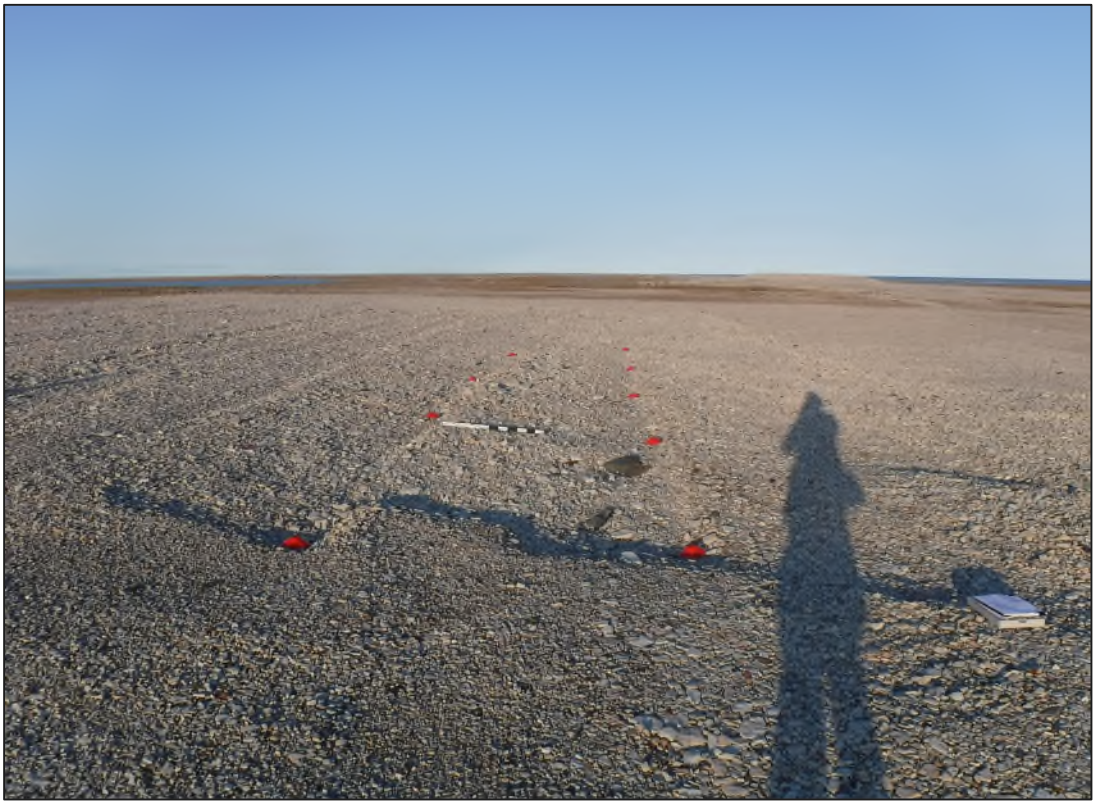


Photo: PIN-3 NHLF_42

Date:
17 August 2019

Description:
View of bulldozer blade/track marks on cap.

Project Photographs

PIN-3 Select Site Photographs
Non-Hazardous Waste Landfill – 17 August 2019

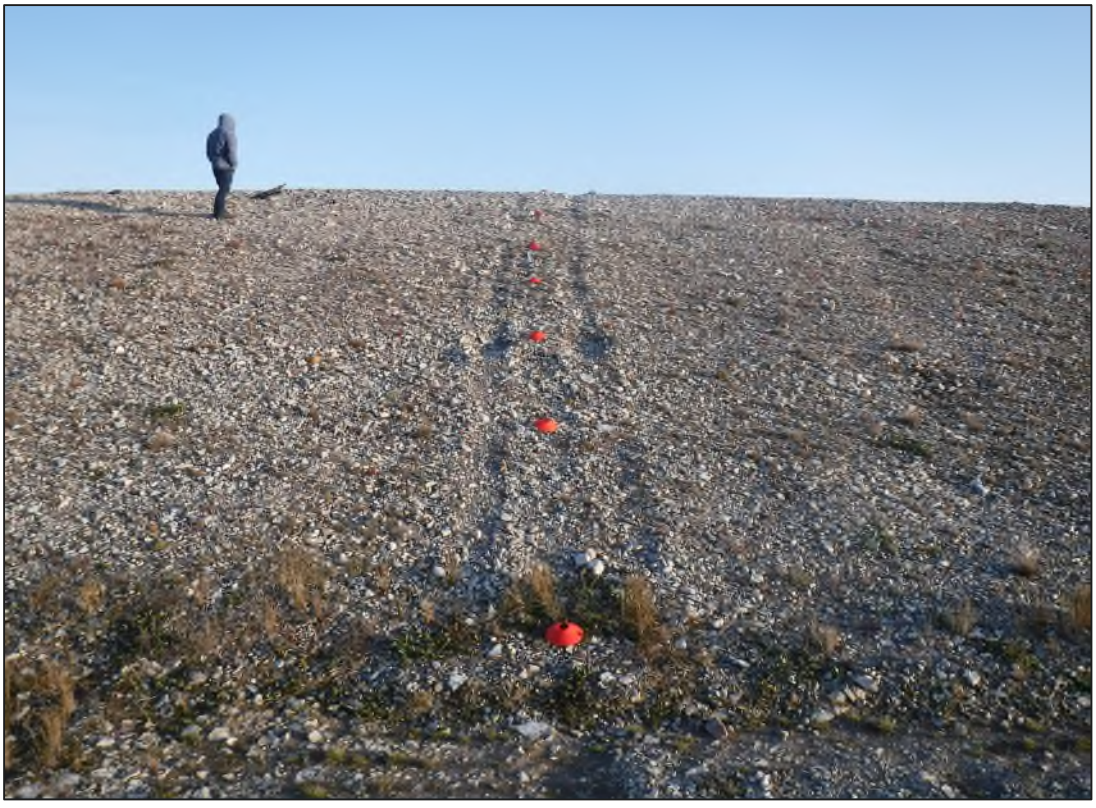


Photo: PIN-3 NHLF_46

Date:
17 August 2019

Description:
View of Feature I, ATV ruts. New observation in 2019.



Photo: PIN-3 NHLF_47

Date:
17 August 2019

Description:
View of Feature D2, minor depression. Appears to be fines infiltration.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019

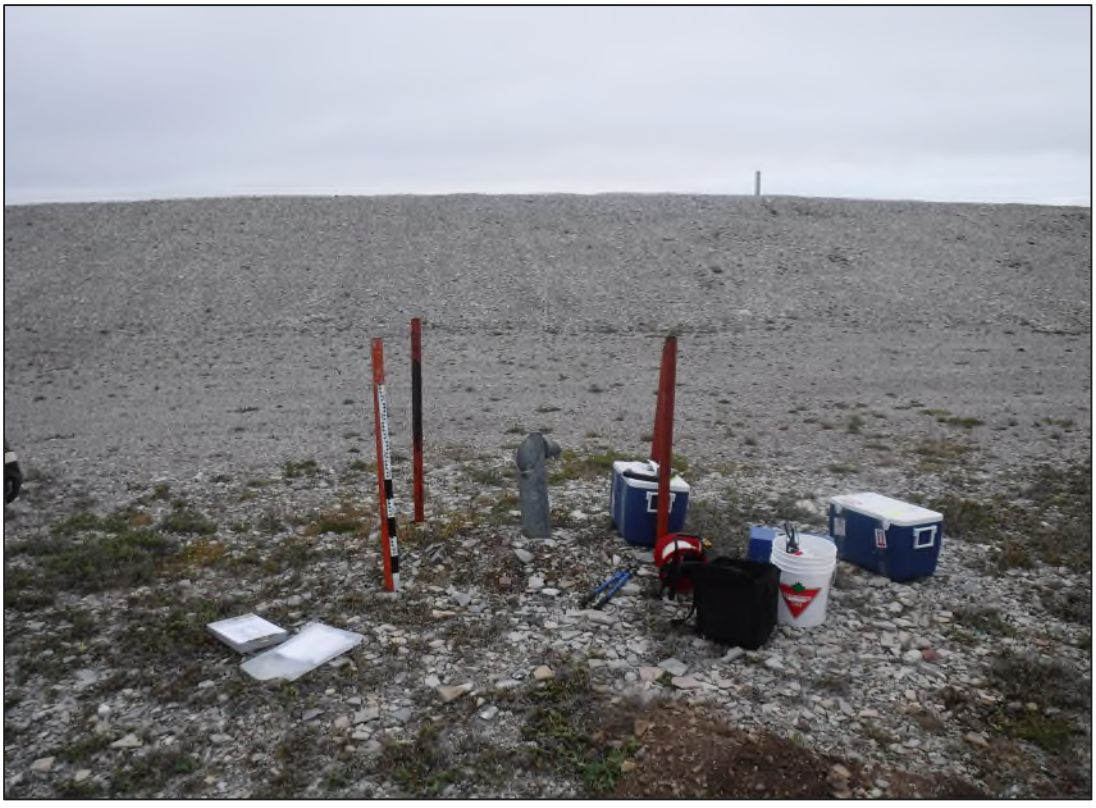


Photo: PIN-3 T2LF_1

Date:

16 August 2019

Description:

View of MW-09 and the N side of the landfill. Shows side slope and transition to surrounding area.

VT-5 visible on top of landfill.

MW configuration with four angle iron markers is typical of MW installations at this site.



Photo: PIN-3 T2LF_2

Date:

16 August 2019

Description:

View along N toe of landfill. Typical of slope and transition.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_3

Date:
16 August 2019

Description:
View along W slope of landfill, from midslope. Typical configuration.

Surrounding low-lying terrain to the S of landfill is shown in background.



Photo: PIN-3 T2LF_4

Date:
16 August 2019

Description:
View along N crest of landfill, typical configuration.

VT-5 and -6 also visible.

Cap material and condition shown.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_6

Date:
16 August 2019

Description:
View across landfill cap. Shows cover material and condition.

Low-lying terrain to the S visible in background.



Photo: PIN-3 T2LF_7

Date:
16 August 2019

Description:
View of Feature E1, depression.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_10

Date:
16 August 2019

Description:
View of Features J1 and J2. Typical of minor erosion channels.



Photo: PIN-3 T2LF_12

Date:
16 August 2019

Description:
View of Feature I1, minor erosion channel.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_17

Date:
16 August 2019

Description:
View of Feature B1, depression.



Photo: PIN-3 T2LF_19

Date:
16 August 2019

Description:
View up SW corner slope. Typical configuration.

Feature I2 (minor erosion) shown as well.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_23

Date:

16 August 2019

Description:

View of S side of landfill.

Thermistors visible atop landfill structure.

MW-11 being sampled in the foreground.

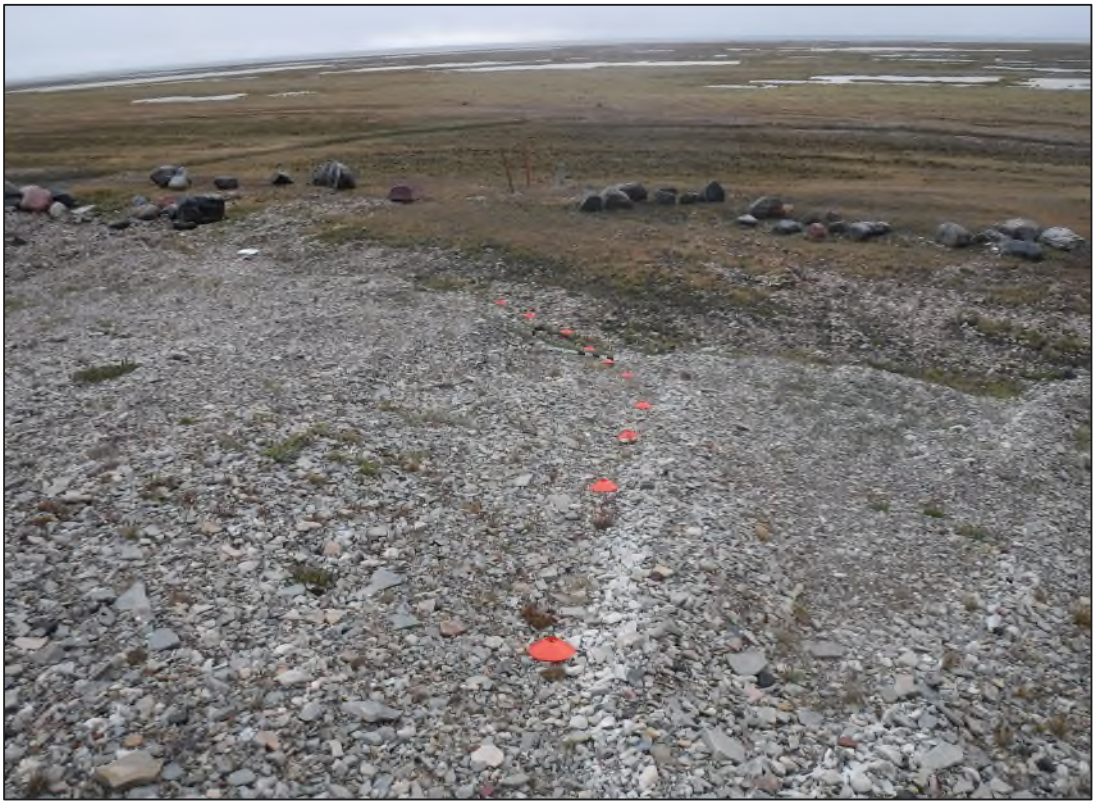


Photo: PIN-3 T2LF_28

Date:

16 August 2019

Description:

View of Feature G1, construction relic (track mark).

Low-lying terrain to the S visible in bakground.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_33

Date:
16 August 2019

Description:
View of VT-8. Typical thermistor installation.



Photo: PIN-3 T2LF_34

Date:
16 August 2019

Description:
View of Feature C1, minor depression.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_40

Date:
16 August 2019

Description:
View of Feature B2, depression.

Feature is directly adjacent VT-7, which is also visible.



Photo: PIN-3 T2LF_42

Date:
16 August 2019

Description:
View of Feature K, sparse vegetation.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_47

Date:
16 August 2019

Description:
View of Feature D2, depressed area on E crest.



Photo: PIN-3 T2LF_52

Date:
16 August 2019

Description:
View of Feature F1, minor erosion.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_55

Date:
16 August 2019

Description:
View up NE corner slope.

Feature F2 (minor erosion) also visible.



Photo: PIN-3 T2LF_57

Date:
16 August 2019

Description:
View of Feature A, depression.

Project Photographs

PIN-3 Select Site Photographs
Tier II Soil Disposal Facility – 16 August 2019



Photo: PIN-3 T2LF_58

Date:
16 August 2019

Description:
View of Feature C3. Depressed and disturbed area on landfill cap.

Also shows cover material and condition of cap.



Photo: PIN-3 T2LF_62

Date:
16 August 2019

Description:
View of Feature E3, depression.

Configuration suggests a combination of equipment tracks and settlement.

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