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REPORT ON

CORRECTIVE MEASURES STUDY
RACER TRUST
RACER ELYRIA, ELYRIA, OHIO

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
RACER Trust
Detroit, Michigan

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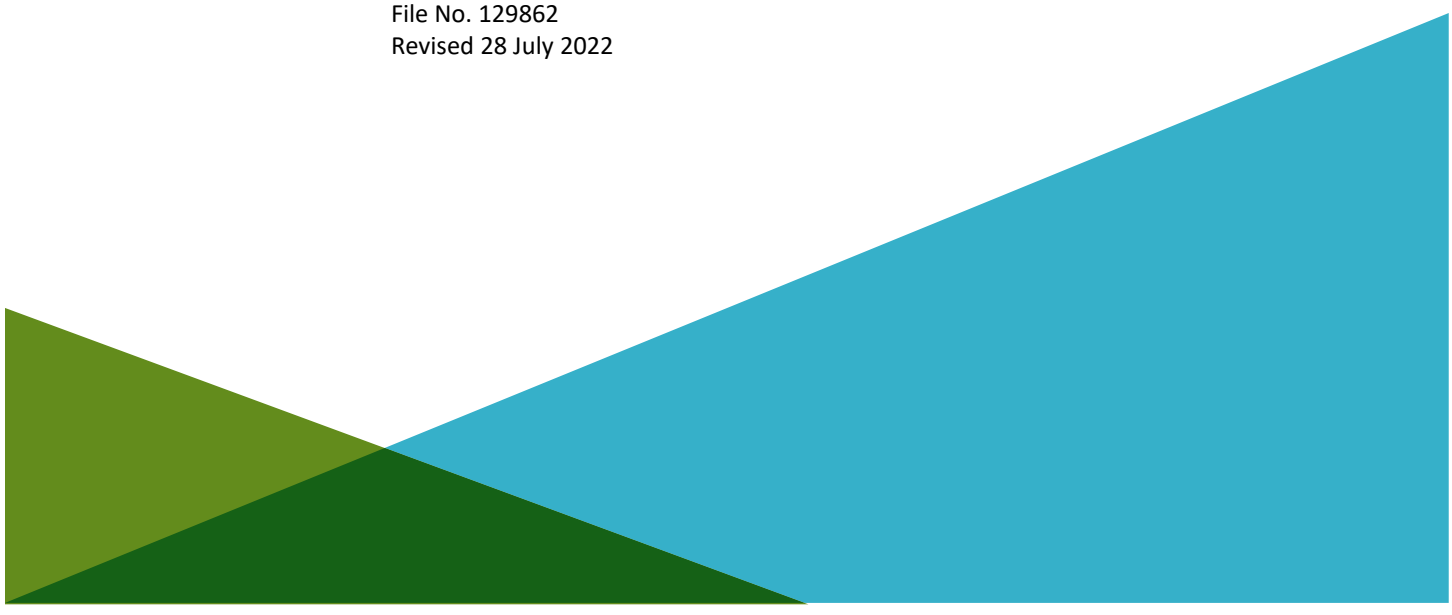

HALEY & ALDRICH, INC.
6500 ROCKSIDE ROAD
SUITE 200
CLEVELAND, OH 44131
216.739.0555

SIGNATURE PAGE FOR

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PREPARED FOR

RACER TRUST
DETROIT, MICHIGAN

PREPARED BY:

Ban Aragona
Senior Project Manager
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Lloyd S. Ross
Senior Technical Expert
Haley & Aldrich, Inc.

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List of Abbreviations

Abbreviation	Definition
ACM	asbestos containing material
AOC	area of concern
AOI	area of interest
bgs	below ground surface
CMS	Corrective Measure Study
COC	contaminant of concern
COPC	contaminant of potential concern
GM	General Motors
GM Facility	General Motors Inland Fisher Guide Division Plant
Haley & Aldrich	Haley & Aldrich, Inc.
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
MCL	maximum contaminant limit
mg/kg	milligrams per kilogram
NOALP	Northern Ohio Associates Limited Partnership
Ohio EPA	Ohio Environmental Protection Agency
PCBs	polychlorinated biphenyls
RACER	Revitalizing Auto Communities Environmental Response
RCRA	Resource Conservation and Recovery Act
REALM	Remediation and Liability Management, Inc.
RFI	RCRA Facility Investigation
RG	remedial goal
RO	Remediation objective
Site	1400 Lowell Street, in the City of Elyria, Lorain County, Ohio
U.S. EPA	United States Environmental Protection Agency
VOCs	volatile organic compounds
WWTP	wastewater treatment plant

1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this Resource Conservation and Recovery Act (RCRA) Corrective Measures Study (CMS) on behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust for the property located at 1400 Lowell Street, in the City of Elyria, Lorain County, Ohio ("Site"; Figure 1). The United States Environmental Protection Agency (U.S. EPA) Identification Number for the Site is OHD004201091.

For each area identified in the Site's Site Summary Report (CRA, June 2007), a RCRA Facility Investigation (RFI) was conducted. The results of the RFI were documented in the *2016 RFI Report* (CRA, 2016) for each area of concern (AOC[1]). In addition, supplemental investigations were undertaken at several AOCs and other Site areas to supplement the AOC surface soil data, define the extent of soil cover over the historically covered setting basin, and to delineate the extent of asbestos containing material (ACM). These supplemental investigations were combined into a R*evised Supplemental RFI Report* (Haley & Aldrich, 2021). The 2021 R*evised Supplemental RFI Report* included results from multiple investigations and an updated risk evaluation for surface soil at each of the AOCs.

This CMS evaluates the proposed Corrective Measures for the AOCs warranting further evaluation and the proposed remedies for the ACM material and the historically covered settling basin. The final Corrective Measures for the AOCs and other identified environmental conditions for the Site will be selected after a public comment period. The Report is organized as follows:

- Section 2 provides a summary of the proposed Final RCRA Corrective Measures and remedial responses;
- Section 3 provides a summary of: the Site background information; a summary from the RFIs as presented in the 2016 *RFI Report* and the 2021 *Revised Supplemental RFI Report* of the RFI AOCs, extent of ACM, historical cover, and existing RCRA landfill;
- Section 4 provides a summary of Human Health Risk Assessments (HHRA) presented in the 2016 *RFI Report* and the 2021 *Revised Supplemental RFI Report*;
- Section 5 provides a detailed summary of the Corrective Measures and other remedy alternatives;
- Section 6 provides an evaluation of the proposed Corrective Measures remedies relative to the Corrective Action Threshold and Balancing criteria as well as an evaluation of other proposed remedies;
- Section 7 provides an overview of the schedule for implementation of the Final RCRA Corrective Measures and submittal of the Final Remedy Construction Completion Report; and
- Section 8 provides references.

[1] Historical documents for the Site including the 2016 RFI Report used the term Areas of Interest (AOI). However, in keeping with the Ohio Environmental Protection Agency (Ohio EPA) requested terminology used in the 2021 Revised Supplemental RFI Report, the areas are referred to using the term Areas of Concern (AOC) rather than AOIs.

2. Proposed Final Corrective Measures

The proposed Final RCRA Corrective Measures for this Site include:

- Site-wide:
- Baseline institutional controls established through deed restrictions pertaining to land use at the Site and use of groundwater at the Site, to ensure that the HHRA assumption for future on-Site groundwater and land use remain valid. Specifically, such controls will include restrictions that will maintain continued commercial/industrial use of the Site and will prohibit any future use of groundwater at the Site for any purpose, beyond dewatering for construction/infrastructure, sampling, or other remediation activity.
  - Implementation of Risk Mitigation Plan to manage subsurface soil during future work conducted at the Site including in the Northern Sludge Area (AOC-2), Northern Die Storage Area (AOC-6) and Southern Die Storage Area (AOC-7).
- Implementation of a Groundwater Monitoring Plan.
- Continued Post-Closure Care of the existing closed RCRA landfill under an Ohio EPA approved Post-Closure Care Plan.
- Polychlorinated biphenyls (PCBs) in Southern Trenches (AOC-5): Excavate soil with concentrations of PCBs equal to or greater than 9.7 milligrams per kilogram (mg/kg) at AOC-5 (Southern Trenches Area) and backfill to existing grade.

In addition, the following additional remedial actions for other areas at the Site are proposed:

- ACM: remove surficial ACM, periodically monitor area for exposed ACM as part of the Site Inspection Plan and manage subsurface work in this area through the Risk Mitigation Plan.
- Historically Covered Settling Basin (AOC-2): placement of supplemental soil where existing cover thickness is less than 6 inches thick over settling residuals to equal at least 6 inches total cover.

3. Site Background

3.1 SITE DESCRIPTION

The Site occupies approximately 95 acres (Parcel #0624012102004) in Lorain County, Ohio (Figure 1). Abutting properties and land-uses include:

- To the north: a 193-foot-wide railway right-of-way, commercial/industrial properties, and Lowell Street
- To the east: City of Elyria owned vacant property with dense tree cover
- To the south: vacant agricultural property and Leo Bullocks Parkway
- To the west: a 141-acre property owned by Northern Ohio Associates Limited Partnership (NOALP) that is currently used for commercial/industrial purposes

On 1 June 2009, former GM Corporation and certain subsidiaries filed voluntary petitions for relief under Chapter 11 of the Bankruptcy Code. An order was entered approving the sale of substantially all former GM Corporation's assets to a new and independent company (now known as General Motors Company, LLC) under Section 363 of the Bankruptcy Code on 5 June 2009. The sale closed on 10 July 2009. At that time, former GM Corporation changed its name to Motors Liquidation Company. RACER Trust was established on 31 March 2011 by a federal bankruptcy court to own, manage, remediate, and revitalize the properties from the 2009 former GM Corporation bankruptcy.

3.1.1 Historical Site Use

Historically, the Site and the abutting property to the west (owned by NOALP) were part of the General Motors Inland Fisher Guide Division Plant ("GM Facility"). The portion of the GM Facility that contained the actual production facility was sold to NOALP subsequent to facility closure activities including decontamination and offsite disposal of waste. The remaining portion was transferred to Remediation and Liability Management, Inc. (REALM). The portion of the GM Facility owned by REALM was then transferred to RACER Trust as part of the bankruptcy proceedings of General Motors Company, LLC.

Electroplating processes, which generated wastewater, were used at the GM Facility. A wastewater treatment plant (WWTP) was used to neutralize wastewater, generating residual sludges that were placed in surface impoundments (southern and northern settling basins) at the Site.

The northern settling basin was used for placement of WWTP sludges from 1956 to 1967 (Ecology, 1991), and based on aerial photographs (historical aerials.com), this area was subsequently covered prior to Ohio's 1969 solid waste rules. No sludges were placed into the southern surface impoundments after August 1986 (Fisher Guide, 1987). All production at the GM Facility ceased in July 1988 (Fisher Guide, 1988). Further information about historical Site use and Site investigation work was provided in the 2016 *RFI Report*.

During the course of conducting Site closure activities, the Site's RCRA treatment, storage, and disposal units were closed in accordance with Ohio EPA or U.S. EPA approved plans and specifications. These closed units included three sludge dewatering surface impoundment units. In 1988, closure of the surface impoundment units was accomplished by removing hazardous wastes and contaminated soil in

accordance with the approved closure plan and disposing of those materials in an onsite landfill disposal unit. This closed RCRA landfill unit was designed and constructed in accordance with RCRA standards and in accordance with Ohio EPA and U.S. EPA approved closure plans. Following receipt of all surface impoundment closure wastes, the landfill was capped and closed. Figure 2 depicts the location of the closed RCRA landfill with respect to the 95-acre land parcel.

3.1.2 Current and Future Site Use

Although no daily activities currently occur at the Site, land use is considered commercial/industrial. A closed RCRA landfill is located in the southwestern portion of the Site (Figure 2). The future development plans for this Site are not known. However, the Site has been restricted to commercial/industrial use, as outlined in Section 5.2.

3.1.3 Geology and Hydrogeology

The Site geology was described in the 2016 *RFI Report*. In summary, the Site has three main stratigraphic units, from the surface downwards:

1. Clay Till (Drift);
2. Berea Sandstone; and
3. Bedford Shale.

The 2016 RFI identified and investigated groundwater based on two saturated geologic layers consisting of:

1. The Till unit and the contact with the Berea Sandstone (referred to as the Till Contact unit)
2. The upper portion of the Berea Sandstone aquifer (referred to as the Bedrock unit)

Site hydrogeology was evaluated in the RFI Reports. Although investigated during the RFI as two separate saturated zones, the Till Contact and Bedrock Unit are considered to be a single hydrogeological unit based on water levels and other hydrogeologic characteristics. However, contaminant stratification within this saturated zone is possible and may be pertinent with respect to future vapor intrusion exposures. The predominant groundwater flow is to the east. However, groundwater flow is influenced by an existing storm sewer system at the RACER Site. Storm sewer inverts in the system are lower than the groundwater table, and water has been observed to be flowing in the storm sewers even during prolonged periods of dry weather, indicating that the storm sewer acts as a groundwater discharge point. As discussed in the 2016 *RFI Report*, the storm sewers are preventing potential migration of groundwater from the adjacent parcel and the Site on to adjacent properties. However, contaminated groundwater is discharging to the storm sewers. The potential exposure pathways of drinking water, vapor intrusion, and discharge to storm sewers were evaluated as discussed in Section 4.

3.2 INVESTIGATED AREAS

A summary of the various investigations completed at the Site are summarized below and the areas are shown on Figure 2. Details of these investigations are documented in the 2016 *RFI Report* and the 2021 *Revised Supplemental RFI Report*.

3.2.1 RFI Areas of Concern

The 2016 *RFI Report* presented the following nine AOCs that had been identified in the Site Summary Report (CRA, 2007). AOCs are summarized below and shown on Figure 2 and 3.

Table 1. AOC Summary

AOC	Name	Description
AOC-1	Open Burn Area	Area used for open burning and placement of facility trash from 1947 to 1974.
AOC-2	Northern Sludge Area	Area used for placement of approximately 25,000 cubic yards of WWTP sludges from 1956 to 1967. This area was historically covered after cessation of use.
AOC-3	Southern Sludge Area	Area used for placement of approximately 40,000 cubic yards of WWTP sludges from 1972 to 1977.
AOC-4	Northern Trenches Area	Names refer to investigative test trenches excavated in 1988: • Northern Trenches Area: Four trenches were excavated to the northeast of the Open Burn Area and north of the Former Fuel Oil Tank. Two trenches were found to have fill material. • Southern Trenches Area: Four trenches were excavated to the south of the former Fuel Oil Tank. Each trench had fill material.
AOC-5	Southern Trenches Area	
AOC-6	Northern Die Storage Pad Area	Two concrete pads formerly used to store manufacturing dies. Cleaning activities, reportedly using various solvents, occurred on the pads.
AOC-7	Southern Die Storage Pad Area	
AOC-8	Former Fuel Oil Tank Area	Former 2,310,000-gallon fuel oil tank and the earth dyke that surrounded the tank.
AOC-9	Sitewide Groundwater	

Each of these areas were evaluated in the baseline human health risk assessment as summarized in Section 4 below.

3.2.2 Closed RCRA Landfill

The closed RCRA landfill (EPA ID NO. OHD004201091) was constructed in 1988 as part of the closure of three surface impoundments previously used for the handling of sludge from the former GM Facility wastewater treatment system, which operated in the western area of the Site. The sludge was originally generated from copper, nickel, and chrome electroplating operations.

The landfill disposal unit was designed and constructed for the sole purpose of achieving effective closure of the surface impoundment units at the facility. Based on analytical results of the un-stabilized sludge sample, the sludge was classified as an F006 hazardous waste, but was not characteristically hazardous with regard to pH, flashpoint, corrosivity, or reactivity. Analytical results for the sludge are presented in the Post-Closure Groundwater Monitoring Plan (Weston, 1993). The landfill unit is closed and will not receive any additional wastes.

A modified post-closure plan was requested by the Director of the Ohio EPA in 2001, which would conform to the post-closure requirement for groundwater monitoring and cap maintenance under Ohio

Administrative Code Chapters 3745-54 and 3745-55. The goal of the request was to meet Government Performance and Results Act post-closure requirements for the Site by having "an approved control in place." The post-closure period for the facility was extended to 2038 as requested in the letter *Petition for Post Closure Plan Amendment* dated 28 August 2014.

An amended Post Closure Care Plan was prepared in January 2021 and approved in April 2021 (Appendix A) and includes the following operation, maintenance, and groundwater monitoring requirements:

Table 2. Summary of Landfill Operation & Maintenance Groundwater Monitoring Activities

Task	Description
Landfill Cover Inspections	Twice per month or within 5 days of a 2.2 inch 24-hour storm event or snowpack of 10-inch melt within 24 hours
Drain Tile Inspections	Twice per month inspections of critter traps, drainage clearing, and drain tile camera inspections every 5 years
Security	Twice per month fence inspection
Grass Mowing	Four events (from April to October)
Cover Maintenance	As needed
Leachate Removal	Sump levels monitored twice per month
	Extraction quarterly for the first year of the trial period and biannually (twice a year) at a minimum or as needed for the remaining two years of the trial period.
Groundwater Monitoring	Biennial (Every other year with first event in 2016)
Reporting	Biennial (by March 1 the year following groundwater monitoring sampling)

Continued post-closure care of the closed RCRA landfill as described above and outlined in the amended Post Closure Care Plan (January 2021; Appendix A) has been identified as a baseline requirement in the proposed corrective measures, as summarized in Section 5.

3.2.3 Non-RFI Areas

In addition to the AOCs identified above, two additional areas have been identified as warranting further response action and are summarized below.

3.2.3.1 Asbestos Containing Material

Activities at the northern portion of the Site may have resulted in disposal of building debris that contained suspected ACM. As such, investigations were completed in 2017 and 2019 to delineate the extent of ACM at the Site, as described in the 2021 *Revised Supplemental RFI Report*.

Based on the surficial asbestos investigation, eight of the samples were Transite™ panel fragments and one sample was an expansion joint material fragment.

Transite™ panel fragments assessed by Terracon were categorized as U.S. EPA Category II Non-Friable material in fair condition. However, Transite™ panel fragments at the surface may deteriorate over time if left exposed to the environment. Perimeter air monitoring completed during the 2019 surficial asbestos investigations indicates that activities such as mowing, and excavation did not appear to generate a release of fibers.

The presence of ACM in the subsurface has not been evaluated; however, building debris has been noted in historical borings and may contain ACM. In addition, based on the findings of the initial 2017 asbestos survey and the 2019 surficial asbestos investigations, ACM and debris has been observed at the surface at various location in the northern portion of the Site, as illustrated on Figure 4.

Based on the noted observations of ACM and building debris and the potential friability of the ACM, alternatives to manage ACM have been identified and are summarized in Section 5.

3.2.3.2 Existing Cover Over Historically Covered Settling Basin and Pre-Design Investigations

A work plan was submitted to evaluate the thickness of clay cover in the northern portion of the Site, including the Northern Trenches Area, Southern Trenches Area, Northern and Southern Former Die Storage Pad, Open Burn Area, and historically covered Northern Sludge Area settling basin (Haley & Aldrich, 2016).

The investigation identified residual WWTP sludges within 2 feet below ground surface (bgs) in several locations and within 6 inches bgs in two areas within the Northern Sludge Area (Figure 4).

Analytical data was collected from Northern Sludge Area, Southern Trenches Area, Northern Former Die Storage Pad, and Southern Former Die Storage Pad as part of the Pre-Design Investigation work, as summarized in the 2021 *Revised Supplemental RFI Report.* In the samples of black organic material near Northern Former Die Storage Pad, Southern Former Die Storage Pad, and in the samples of blue sludge material in Northern Sludge Area, there were no detections of volatile organic compounds (VOCs), semi-volatile organic compounds, PCBs, and Target Analyte List metals in soil samples that exceeded the then-applicable 2017 U.S. EPA Regional Screening Levels. These samples were further evaluated in the 2021 *Revised Supplemental RFI Report*.

Alternatives to manage historically covered settling basin have been identified and are summarized in Section 5.

4. Human Health Risk Assessment

A HHRA was documented in the 2016 *RFI Repo*rt and in the 2021 *Revised Supplemental RFI Report* for each of the AOCs. A target organ evaluation was prepared in response to the findings in the HHRA Update to evaluate cumulative risk to specific target organs (Appendix B). The combined conclusions of the HHRA are summarized below and location of data used in the evaluation of each AOC is shown on Figure 3.

The HHRA noted that VOCs were detected in groundwater at concentrations greater than the U.S. EPA maximum contaminant levels (MCL). Therefore, potential exposure through potable use of groundwater was assumed to result in an unacceptable risk. Furthermore, although there are no habitable structures currently on the Site, the presence of volatile organic compounds in shallow groundwater at the upgradient boundary of the Site has the potential for unacceptable vapor intrusion to future buildings. As such, the HHRA concluded that an environmental covenant would be required to prevent potable use of groundwater and to require vapor intrusion evaluations prior to the construction of future buildings at any location on Site.

Based on the groundwater flow direction and groundwater sample concentrations, chlorinated solvents are not migrating off of the Site at concentrations greater than the MCLs. However, chlorinated compounds in groundwater are discharging to the storm sewers. Samples were collected from the storm sewer system during dry conditions. The VOCs detected in the storm sewer at the property boundary are less than the surface water outside mixing zone area criteria and therefore do not pose a risk to surface water. Based on the above, demonstration that the storm sewers continue to control groundwater flow is warranted to prevent off-site groundwater migration.

The HHRA provided a quantitative evaluation of exposure to total soil for cancer risks, noncancer hazards, and lead exposure. The following media and potential human exposures (i.e., complete pathways) were identified for quantitative evaluation in the HHRA:

- The Incidental ingestion of soils by adolescent trespassers, industrial/commercial workers, and construction/utility workers;
- Dermal contact with soils by adolescent trespassers, industrial/commercial workers, and construction/utility workers; and
- Inhalation of contaminants of potential concern (COPCs) particulates in ambient air.

Because the HHRA did not quantify residential use, the 2016 *RFI Report* concluded that an environmental covenant would be required to prevent potable use of groundwater and to require vapor intrusion evaluations prior to the construction of future buildings at any location on Site. Additional evaluation of Site groundwater was conducted as presented in the 2021 *Revised Supplemental RFI Report* as outline below. An environmental covenant is required to prevent future residential use at the Site without additional evaluation.

The HHRA concluded that:

- The calculated cancer risk and non-cancer hazard for the adolescent trespassers exposure to COPCs in soils did not exceed risk thresholds within any of the areas.

- The calculated cancer risk and non-cancer hazard for the industrial/commercial worker exposure to COPCs in surface soils did not exceed the risk thresholds in areas with the exception of the following:
- Northern Sludge Area (AOC-2): The calculated cumulative non-cancer hazard (4) is greater than the hazard threshold. No individual constituent has a single chemical calculated non-cancer hazard constituent greater than the threshold. As described below, the cumulative non-cancer risk is strongly influenced by single samples from S3, S4, and GP-402 (see Figures 3 and 4) which were typically an order of magnitude greater than the next greatest sample concentration. The following sample results contribute to the cumulative exceedance:
- Total cyanide (hazard of 1) from a maximum concentration (143 mg/kg) from a soil sample from location S4 collected in 1990 which is less than the single chemical industrial screening level of 150 mg/kg. Concentrations of cyanide in samples at this magnitude were not detected in other samples from AOC-2, with the next greatest sample concentration of total cyanide is 1.4 mg/kg.
- Thallium (hazard of 0.8) from a maximum sample concentration (9.9 mg/kg) from GP-402 collected in 2017 which is less than the single chemical industrial screening level of 12 mg/kg. The next greatest detected sample concentration of thallium is 1.3 mg/kg.
- Antimony (hazard of 0.7) from an upper confidence limit which is strongly influenced from the sample from S4 collected in 1990 with 385 mg/kg which is less than the single chemical industrial screening level of 470 mg/kg. The next greatest concentration of antimony is 116 mg/kg collected from S3 in 1990. The sample concentrations collected during the RFI in 2011 and 2017 which included direct biased sampling of the sludge residual ranged from less than 1.1 mg/kg to 36 mg/kg.
- Addressing concentrations observed at GP-402 and S4 would lower the cumulative risk estimate to less than Ohio EPA target risk levels.
- Southern Trenches Area (AOC-5): The calculated cancer risk (2E-05) is within the U.S. EPA cancer risk range of 1E-4 to 1E-6 and greater than the Ohio EPA's risk threshold of 1E-5. The exceedance of the 1E-5 threshold is primarily attributable due to the presence of PCBs. The calculated non-cancer hazard (2) is greater than the risk threshold of 1. PCBs are also the greatest single chemical contributor (0.9) to the calculated cumulative non-cancer risk. Remedy of the PCBs concentrations greater than 9.7 mg/kg would result in the calculated cancer risk and non-cancer hazard to be less than risk thresholds.
- Northern Die Storage Pad Area (AOC-6): The calculated cumulative non-cancer hazard (2) is greater than the hazard threshold. No individual constituent has a single chemical calculated non-cancer hazard constituent greater than the threshold. Nickel concentrations from two samples, BH49-13 from 0.5 to 2.5 feet bgs and BH43-13 from 0.5 to 2.5 feet bgs at 23,000 mg/kg and 25,000 mg/kg, respectively, strongly influence the exposure point concentration upper confidence limit estimate of 21,585 mg/kg. The next greatest concentration of nickel out of 40 other samples from AOC-6 is 12,300 mg/kg. It is also noted that the BH43-13 sample is from beneath the existing concrete pad.
- Southern Die Storage Pad Area (AOC-7): The calculated cancer risk (2E-05) is within the U.S. EPA cancer risk range of 1E-4 to 1E-6 and greater than the Ohio EPA's risk threshold of 1E-5. No single constituent is greater than the cancer risk threshold of 1E-05. The exceedance of the 1E-5 threshold is attributable due to the contribution of arsenic, hexachlorobenzene, or trichloroethene:

- Only one of the five arsenic sample concentrations (32 mg/kg) from AOC-7 is greater than the background limit. Nonetheless, arsenic was included in the risk calculations which results in exceedance of the cancer risk threshold.
- Hexachlorobenzene or trichloroethene from locations GP-312 and GP-405 are also contributors to the exceedance of the cancer risk threshold. It is noted that there are greater concentrations of both compounds in the subsurface soil that contributes to the subsurface soil risk described below.
- The calculated non-cancer hazard (2) is greater than the risk threshold of 1. Trichloroethene is the greatest single chemical contributor (hazard of 0.8) to the calculated cumulative non-cancer risk.
- The calculated cancer risk and non-cancer hazard for the industrial/commercial worker future exposure to COPCs in subsurface soils, if the subsurface soil were to be exposed and remain as surface soil, did not exceed the risk thresholds with the exception of in Southern Sludge and Southern Die Storage Area.
- The calculated cancer risk for the construction/utility worker exposure to COPCs in soils did not exceed cancer risk thresholds within any of the areas; however, the non-cancer hazard threshold was exceeded in all areas except the Open Burn Area (AOC-1).

Additional evaluation (Appendix B) was performed to evaluate target organs as part of the noncancer hazards. As noted above, the commercial/industrial non-cancer hazards for AOC-2, 5, 6, and 7 exceed a hazard index (HI) of 1 in surface soil. These cumulative HIs were calculated by summing the hazard quotients (HQs) for all contaminants of concern (COCs). An HI that is calculated by summing the HQs for all COCs generally overestimates potential risk because all COCs do not typically cause adverse health effects to the same target organ(s) or by the same mechanism of action. The evaluation of target organ effects can also underestimate potential risk if the additivity between multiple COCs with the same potential target organ(s) and mechanism of action is not accounted for in the analysis. An evaluation of non-cancer hazards by target organ effects is provided in Appendix B and summarized below.

COCs may not cause adverse health effects to the same target organ(s) or by the same mechanism of action. For example, certain COCs only affect the central nervous system while others only affect skin. Therefore, summing the risk of adverse health effects for COCs with different target organ(s) or different mechanisms of action does not provide an accurate estimate of risk for those COCs; rather, it provides an overestimate of general risk (U.S. EPA, 1989). Therefore, when HI values exceed 1, and the HQ values associated with any given COC do not exceed 1, it is appropriate to conduct an additional evaluation of the target organ effects for each COC individually to determine if it is appropriate to sum HQ values among COCs. Separate HI values for specific target organ effects may then be calculated and evaluated against the goal of an HI of 1. Additional details of this evaluation process are provided in Appendix B.

This evaluation has been completed for AOCs 2, 5, 6, and 7, as detailed in Appendix B. Based on that evaluation, HI values do not exceed 1 for Northern Sludge Area (AOC-2), Southern Trenches Area (AOC-5), Northern Die Storage Pad Area (AOC-6), and Southern Die Storage Pad Area (AOC-7) when evaluated by target organ effect.

5. Summary of Corrective Measures Alternatives

5.1 CORRECTIVE MEASURES OBJECTIVES

Based on the conclusions of the HHRA summarized in Section 4 and the other identified conditions in Section 3, the following remediation objectives (RO) are identified for the RCRA Corrective Action:

1. Prevent residential use of the property.
2. Prevent construction of habitable structures without appropriate vapor intrusion evaluations.
3. Prevent unacceptable exposure to groundwater.
4. Prevent potential commercial/industrial exposures to subsurface soil greater than acceptable risk thresholds in the Southern Trenches Area (AOC-3), and Southern Die Storage Pad Area (AOC-7) and prevent potential construction worker exposures to subsurface soil greater than acceptable risk thresholds in all AOCs except for Open Burn Area (AOC 1).
5. Maintain the closed Landfill area consistent with the requirements outlined in the approved amended Post Closure Care Plan (Haley & Aldrich, 2021) (see Section 3.2.2 and Appendix A).
6. Prevent potential exposures to surface soil with concentrations greater than acceptable risk thresholds in Northern Sludge Area (AOC-2), Southern Trenches Area (AOC-5), Northern Die Storage Pad Area (AOC-6), and Southern Die Storage Pad Area (AOC-7).

In addition, the following additional remedial goals (RG) beyond the RCRA Corrective Action are identified at the Site:

1. Prevent exposure to friable asbestos (see section 3.2.3.1).
2. Maintain cover over historically covered settling basin.

The responses to meet these objectives for the Site are summarized below, along with an indication of how the objectives will be addressed:

Table 3. Corrective Measure and non-RFI Responses

RO/RG	Corrective Measure or Remedial Response	Addressed by:	Document in which addressed:
1	Restrict future land use to commercial or industrial uses only.	Baseline Institutional Controls (Environmental Covenant)	Section 5.2 of this document and Appendix C.
2	Require a vapor intrusion evaluation prior to construction of future buildings on Site.		
3	Prohibit groundwater extraction except for investigation, monitoring, or remediation of groundwater and prohibit potable use of groundwater		
3	Monitor AOC-9 (Sitewide groundwater; concurrent with landfill monitoring).	Groundwater Monitoring Plan	See Appendix D
4	Manage exposure to soil deeper than 2 feet bgs.	Risk Mitigation Plan	See Appendix E
5	Continue operation and maintenance for the closed RCRA landfill.	Post-Closure Care Document	Section 5.3

RO/RG	Corrective Measure or Remedial Response	Addressed by:	Document in which addressed:
6	Manage potential exposures to concentrations of cyanide, thallium, antimony, nickel, and/or trichloroethylene in surface soil at AOC-2 (Northern Sludge Area), AOC-6 (Northern Die Storage Pad Area), and AOC-7 (Southern Die Storage Pad Area) greater than risk thresholds.	Remedy alternatives discussed below	Section 5.3 of this document
6	Address elevated concentrations of PCBs in soil at AOC-5 (Southern Trenches Area).	Remedy alternatives discussed below	Section 5.3 of this document
7	Manage ACM	Remedy alternatives discussed below	Section 5.3 of this document
8	Address areas of historically covered settling basin where cover material is less than 6 inches thick.	Remedy alternatives discussed below	Section 5.3 of this document

5.2 BASELINE INSTITUTIONAL CONTROLS

An environmental covenant (presented as Appendix C) has been recorded for the Site, which includes Baseline Institutional Controls that are integral to the alternatives described in Section 5.3. The environmental covenant establishes restrictions for future use of groundwater and land use at the Site, to ensure that the human health risk assessment assumptions remain valid. The area subject to the environmental covenant is the perimeter boundary of the Site, shown on Appendix C, Exhibit 2. The environmental covenant states:

A. The Property is restricted to commercial or industrial land use only. Residential land use of the Property is prohibited.
B. Groundwater located at or underlying the Property shall not be extracted or used for any purpose, potable or otherwise, except for investigation, monitoring, or remediation of the groundwater (including by monitoring well) or in conjunction with construction or excavation activities or maintenance of subsurface utilities.
C. Construction of potable water wells is prohibited.
D. The Property must comply with applicable standards for the vapor intrusion to indoor air exposure pathway prior to occupancy of any structures.
E. For any and all excavation activities occurring at any depth below the upper two feet within the areas identified in Appendix E, notice must be provided to the Owner and Ohio EPA at a minimum of 72 hours prior to commencing work.
F. No soil shall be transferred from the property without notice to the Owner and Ohio EPA.
G. No activity on the Property that may impact or interfere with the landfill unit, identified in Exhibit 3, shall occur, and any operation, maintenance, inspection, or monitoring of the landfill unit shall occur without prior written approval from the Owner.

A Groundwater Monitoring Plan has been prepared (presented as Appendix D) to describe biennial sampling and monitoring used to demonstrate that groundwater flow conditions are consistent with the conclusions of the Remedial Investigation. Groundwater monitoring is planned to be conducted every even year, to coincide with Landfill groundwater monitoring.

A Risk Mitigation Plan has been prepared (presented as Appendix E) to describe the procedures required to ensure worker safety during soil disturbing activities.

An amended Post Closure Care Plan was prepared in January 2021 and approved in April 2021 (Appendix A) and describes the operation, maintenance, and groundwater monitoring requirements for continued care of the landfill.

Additional controls beyond the Baseline Institutional Controls are discussed in the following sections.

5.3 REMEDY ALTERNATIVES

The remedy alternatives presented in Sections 5.3.1 and 5.3.2 outline the Corrective Measures to address the following:

- Exposure risk to human health at AOC-2 (Northern Sludge Area), AOC-6 (Northern Die Storage Pad Area), and AOC-7 (Southern Die Storage Pad Area) (elevated concentrations of cyanide, thallium, antimony, nickel, and/or trichloroethylene); and,
- Exposure to PCBs at Southern Trenches Area (AOC-5).

In addition, remedy alternatives presented in Sections 5.3.3 and 5.3.4 summarizes remedial responses to address the following:

- ACM in soil; and,
- Care of Historical closure of settling basin.

The remedy alternatives for each of these areas have common elements, which are not re-stated in each discussion, but which include:

- Baseline Institutional Controls outlined in Section 5.2;
- Biennial Sitewide groundwater monitoring (every even year, to coincide with Landfill groundwater monitoring; provided under separate cover); and,
- Annual Sitewide inspections incorporated into the Risk Mitigation Plan.

Alternatives remedies to address the areas above are summarized in the table below and described in the following sections.

Table 4. Corrective Measure and Remedial Response Alternatives

Area	Alternatives		
AOC 2, 6, and 7	No Action	Manage in Place	Removal
AOC – 5	No Action		Removal
ACM	No Action	Surface Abatement and long-term Monitoring	Bulk Soil and ACM Removal
Historical Closure of Settling Basin Area	No Action	Supplemental Soil	New Cover System

The areas subject to these additional controls, as well as the common elements described above, are illustrated on Figure 4. The alternatives are further described below for each area.

5.3.1 Alternatives for AOC-2, AOC-6, and AOC-7 with Elevated Sample Concentration of Cyanide, Thallium, Antimony, Nickel, or Trichloroethene

The alternatives to manage the elevated concentrations of cyanide, thallium, antimony, nickel, and/or trichloroethylene include no action, manage in place, and removal or cover. Each of these alternatives are described below:

No Action: This alternative is required and used to establish a baseline for comparison of remedial alternatives. For purposes of this comparison, the no action alternative assumes that the existing environmental covenant and other Baseline Institutional Controls are not implemented.

Manage in Place: This relies on the findings of the target organ segregation evaluation and the Risk Mitigation Plan to be properly manage these areas.

Removal: This alternative would excavate as hotspots around specific locations contributing to the non-discretized cumulative risk levels and dispose the material off-site. For purposes of this evaluation, the removal would be in the following areas (Figure 4):

- AOC-2: Approximately 6,500 and 10,000 sq feet around sample locations S4 and GP-402, respectively to an approximate depth of 2 feet bgs.
- AOC-6: Approximately 1,600 sq feet area (40 by 40 feet) around both sample locations BH43-13 and BH49-13 to an approximate depth of 2 feet bgs.
- AOC-7: Approximately 1,400 and 1,800 sq feet around sample locations GP-312 and GP-405, respectively to an approximate depth of 2 feet bgs.

Each area would be backfilled with clean imported soil and finished with a 6-inch layer of topsoil.

5.3.2 Alternatives for AOC-5 Southern Trenches Area PCBs

The alternatives to manage the elevated concentrations of PCBs within a discrete area of AOC-5 include no action or removal. The owner of the property has expressed interest to proceed with a removal action for the PCBs within AOC-5. As such, only two alternatives are evaluated herein to document how this Corrective Measure achieves the ROs. Each of these alternatives are described below:

No Action: This alternative is required and used to establish a baseline for comparison of remedial alternatives. For purposes of this comparison, the no action alternative assumes that the existing environmental covenant and other Baseline Institutional Controls are not implemented.

Removal: This alternative would excavate the soil within 2 feet of ground surface containing concentrations of PCBs greater than 9.7 mg/kg and dispose of the material off-site with restoration of the area to current grade[2]. For purposes of this evaluation, the area of assumed excavation is shown on

[2] This removal action is concurrently being evaluated to be completed as an interim action prior to the finalization of the statement of basis.

Figure 5 and is an approximately 12,000 square foot area (890 in place cubic areas or 1,335 tons). For the evaluation of costs, it is assumed that the material can be disposed as non-hazardous waste.

5.3.3 Alternatives for ACM

The alternatives to manage potential exposures to friable ACM includes no action, surface abatement and manage in place, and bulk soil and ACM removal. Each of these alternatives are described below:

No Action: This alternative is required and used to establish a baseline for comparison of remedial alternatives. For purposes of this comparison, the no action alternative assumes that the existing environmental covenant and other Baseline Institutional Controls are not implemented.

Surface Abatement and Manage in Place: This alternative includes removing identified ACM at surface to minimize the potential for weathering or physical strikes from creating friable material. The Risk Mitigation Plan would require the area to be routinely inspected and visible ACM removed. In addition, excavation in this area would require additional procedures to prevent damaging ACM and properly managing the material either within the existing defined area or with off-site disposal.

Bulk soil and ACM removal: This alternative would excavate and dispose the ACM off-site. For the purposes of this evaluation, the removal would be in the following three areas (Figure 4):

- ACM Area 1: Approximately 34,650 sq feet to an approximate depth of 4 feet bgs
- ACM Area 2: Approximately 37,000 sq feet to an approximate depth of 0.5 feet bgs
- ACM Area 4: Approximately 9,000 sq feet to an approximate depth of 3 feet bgs

It is assumed that the material would be excavated from these areas with approximately 10,165 tons of soil (screening of ACM is not feasible) for bulk (soil and ACM) disposal and restoration to the current grade, which entails removal of soil and backfilling area with clean soil to current grade.

5.3.4 Alternatives for Management of Historically Covered Settling Basin

The alternatives to manage the historically covered settling basin includes no action, enhancement of the existing cover, and construction of a new cover system. Each of these alternatives are described below:

No Action: This alternative is required and used to establish a baseline for comparison of remedial alternatives.

Cover Enhancement: This alternative includes enhancing existing cover soil thickness to a minimum of 6 inches over two areas within the historically covered settling basin. There are two areas identified with less than 6-inches of existing cover which totals approximately 3.33 acres. The Risk Mitigation Plan would require restoration of cover during any work in the area and the sludge material to prevent it from being exposed at the surface.

New Cover System: This alternative includes enhancing existing cover soil such that a minimum of 2 feet is present over sludge residuals within an approximately 12.5-acre area. The Risk Mitigation Plan would require restoration of cover during any work in the area and the sludge material to be disposed of off-site if the material cannot be maintained beneath the soil or hard cover in the future.

6. Selection and Evaluation of Proposed Corrective Measures

The criteria used to compare the Corrective Measures alternatives for RCRA remedies identified in Section 5 are summarized in Section 6.1 below. The Corrective Measures alternatives for the Site are evaluated in Section 6.2 for RCRA AOC remedies and in Section 6.3 for non-RFI Areas. The proposed Corrective Measures are summarized in Section 6.4.

6.1 REMEDY SELECTION CRITERIA

The Corrective Measures alternatives were developed considering the RCRA threshold criteria, which include:

1. Protection of human health and the environment;
2. Attainment of clean up objectives;
3. Controlling the sources; and
4. Comply with applicable standards for management of waste.

The Corrective Measures alternatives were then compared to the RCRA balancing criteria which include the following:

1. Long-term Effectiveness;
2. Reduction in the Toxicity, Mobility or Volume of Wastes;
3. Short-term Effectiveness;
4. Implementability; and
5. Costs.

Community acceptance is also a balancing criterion which will be considered after public comments, if any, are received on the proposed Corrective Measures.

Other remedial response actions for the ACM and historically covered settling basin were evaluated based on similar considerations including protection of human health and the environment and costs.

6.2 COMPARISON OF ALTERNATIVES FOR RCRA AOCS

The alternatives, beyond the Baseline Institutional Controls described in Section 5.2, for each of the five areas are evaluated in Sections 6.2 and 6.3 below.

6.2.1 AOC-2, AOC-6, and AOC-7 with Elevated Sample Concentration of Cyanide, Thallium, Antimony, Nickel, or Trichloroethene

Corrective Measures evaluated for the elevated concentrations of cyanide, thallium, antimony, nickel, and/or trichloroethene include no action, manage in place, and removal.

6.2.1.1 Protection of Human Health and the Environment

Based on the findings of the HHRA and the target organ evaluation presented herein, risk from exposure to COCs in soil is less than the risk and hazard thresholds for industrial use. As such, Alternatives 2 and 3 includes the baseline actions which include institutional or administrative barriers or proposes actions

that will restrict future direct contact by residential receptors and limit potential unacceptable exposures to commercial/industrial and construction receptors. The manage in place and excavation scenarios are both protective under current conditions and future industrial use. As such, both Alternatives 2 and 3, with Baseline Institutional Controls implemented, are considered protective of human health and the environment.

6.2.1.2 Attainment of Media Cleanup Objectives

Based on the findings of the HHRA Update and the target organ evaluation presented herein, cleanup objectives in combination with the baseline corrective actions at the AOCs are met by Alternatives 2 and 3.

6.2.1.3 Controlling the Sources of Releases

As discussed in the RFI documents, the sources of releases to soil and groundwater at the Site are believed to be historical and to have been controlled. Therefore, further source control is not necessary and not a component of the alternatives. Residual sources are controlled through Baseline Institutional Controls, including the Risk Mitigation Plan under Alternatives 2 and 3.

6.2.1.4 Applicable Standards for Management of Waste

The proposed alternatives will comply with regulatory waste management standards set forth in the Ohio Revised Code Chapter 3734 and Ohio Administrative Code Chapters 3745-50 through 57, 65 through 69, 205, 256, 266, 270, 273 and 279, and RCRA. Compliance with standards for management of wastes is met by compliance with all applicable federal, state, and local regulations during corrective measures implementation to ensure that the waste is managed in a protective manner.

6.2.1.5 Long Term Reliability and Effectiveness

Alternatives 2 and 3 provide corrective actions that, coupled with Baseline Institutional Controls, are expected to be effective and reliable. The hot spot removal alternatives would result in the excavation and off-site disposal of the material providing more certainty in the long-term reliability and effectiveness at the Site. However, hot spot removals would not eliminate the need for the Baseline Institutional Controls at the Site.

6.2.1.6 Reduction of Toxicity, Mobility or Volumes of Wastes

The removal alternative (Alternative 3) would reduce the volume of contaminants, even though such reductions would not meaningfully increase protectiveness.

6.2.1.7 Short-Term Effectiveness

Because there are not current unacceptable exposures, Alternatives 2 and 3 are considered immediately effective.

6.2.1.8 Implementation

Each of the manage in place and removal alternatives can be implemented with moderate engineering and administrative procedures. The removal and off-site disposal under Alternative 3 have a greater

potential for impact to the surrounding community primarily associated with truck and construction traffic. Because the Baseline Institutional Controls are required in these areas regardless of selected remedy, the administrative requirements of Alternative 2 is considered inconsequential.

6.2.1.9 Costs

Management in place costs are not expected to have cost implications beyond those already required under the Baseline Institutional Controls. The removal alternative is estimated to cost an additional $283,500 (Appendix F).

6.2.2 AOC-5 Southern Trenches Area PCBs

Corrective Measures evaluated for the elevated area of PCB within AOC-5 include no action and removal.

6.2.2.1 Protection of Human Health and the Environment

Calculated risk from exposure to COCs in soil at AOC-5 are greater than the Ohio EPA's cancer risk threshold due to elevated PCBs. As such, the no action alternative would, although within the RCRA cancer risk range, not be considered protective of human health and the environment. The removal of concentrations of PCBs in soil greater than 9.7 mg/kg would reduce the cumulative cancer and non-cancer risk to less than target acceptable thresholds and therefore is protective of human health.

6.2.2.2 Attainment of Media Cleanup Objectives

The removal alternative would achieve cleanup objectives associated with the PCBs within AOC-5.

6.2.2.3 Controlling the Sources of Releases

Further control of the sources of releases are not required. As discussed in the RFI documents, the sources of releases to soil and groundwater at the Site are believed to be historical and to have been controlled. Therefore, further source control is not necessary and not a component of the alternative. Residual sources of PCBs remaining after excavation (less than 9.7 mg/kg) would be controlled through implementation of the Baseline Institutional Controls.

6.2.2.4 Applicable Standards for Management of Waste

The proposed alternatives will comply with regulatory waste management standards set forth in the Ohio Revised Code Chapter 3734 and Ohio Administrative Code Chapters 3745-50 through 57, 65 through 69, 205, 256, 266, 270, 273 and 279, and RCRA. Compliance with standards for management of wastes is met by compliance with all applicable federal, state, and local regulations during corrective measures implementation to ensure that the waste is managed in a protective manner. Based on concentrations the material is not considered subject to the Toxic Substances Control Act.

6.2.2.5 Long Term Reliability and Effectiveness

The proposed removal alternative, with Baseline Institutional Controls in effect, provides corrective actions that are expected to be permanent for the Site and therefore is considered effective and reliable.

6.2.2.6 Reduction of Toxicity, Mobility or Volumes of Wastes

The removal alternative would have the effect of reducing volumes of waste and if off-site disposal includes treatment may reduce toxicity, mobility, or both.

6.2.2.7 Short-Term Effectiveness

The removal alternative requires minor planning and administrative steps to be implemented. The remedy would be immediately effective upon implementation.

6.2.2.8 Implementation

The removal of contaminated soil can be implemented with moderate engineering and administrative procedures. The removal alternative has a greater potential for impact to the surrounding community primarily associated with truck and construction traffic required for the excavation and off-site disposal.

6.2.2.9 Costs

The removal alternative is estimated to cost $143,000 (Appendix F), which is more than the no action alternative ($0).

6.3 COMPARISON OF ALTERNATIVES FOR NON-RFI AREAS

6.3.1 Asbestos Containing Material

Remedial responses for management of the non-friable ACM include no action, surface abatement with management in place, and bulk soil and ACM removal.

A no action alternative has a greater probability of resulting in damage or weathering of the ACM and generating friable material. Both the abatement and manage in place and the bulk removal alternatives reduces the potential for the ACM becoming friable and would minimize subsequent exposure.

Both the manage in place and the bulk removal alternatives provide remedial responses that coupled with Baseline Institutional Controls are expected to be effective and reliable. The bulk removal alternative would provide a higher degree of long-term effectiveness at the Site. The manage in place is easier to implement and the surface abatement can be implemented in a shorter time frame than the bulk removal. The bulk removal alternative has a greater potential for impact to the surrounding community primarily associated with truck and construction traffic required for the excavation and off-site disposal.

The surface abatement and in place management ($40,000) costs less than the bulk removal alternative ($1,275,000). Both active alternatives cost more than the no action alternative ($0).

6.3.2 Management of Northern Sludge Area

Remedial measures for the management of the historically covered northern sludge drying area (AOC 2) includes no action, enhanced cover to supplement areas with less than 6-inches of existing cover, and new cover design and placement to provide a minimum of 2 feet of cover over the entire settling basin.

Potential risk from exposure to COCs in soil in and around AOC-2 was evaluated as part of Corrective Action and potential exposures within this area are below acceptable risk thresholds with consideration of the target organ segregation and implementation of the Baseline Institutional Controls. As such, all three alternatives are protective of human health and the environment. The settling basin operations ceased by the end of 1967, and, as such, are not subject to solid waste standards. As such, each alternative would meet applicable standards for management of wastes.

Continued maintenance of cover over the sludge residuals is considered good practice to minimize the potential for surface run-off or erosion. Both the enhanced cover and new cover would provide greater protection from potential residual source releases. The Corrective Measures under each of the alternatives can be implemented with simple to moderate engineering and administrative procedures. The new soil cover alternative would require more truck and construction traffic than the enhanced cover alternative. As such, the new soil cover alternative has a greater chance of impacting the community.

The new cover alternative ($4,053,000 assuming 60,500 cubic yards at $67 a cubic yard inclusive) is estimated to cost approximately 8-times more than the enhanced cover alternative ($500,000; Appendix F).

6.4 PROPOSED CORRECTIVE MEASURES

The proposed Final RCRA Corrective Measures for this Site include:

- Site-wide:
- Baseline institutional controls established through deed restrictions pertaining to land use at the Site and use of groundwater at the Site, to ensure that the HHRA assumption for future on-Site groundwater and land use remain valid. Specifically, such controls will include restrictions that will maintain continued commercial/industrial use of the Site and will prohibit any future use of groundwater at the Site for any purpose, beyond dewatering for construction/infrastructure, sampling, or other remediation activity.
  - Implementation of Risk Mitigation Plan to manage subsurface soil during future work conducted at the Site including in the Northern Sludge Area (AOC-2), Northern Die Storage Area (AOC-6) and Southern Die Storage Area (AOC-7).
- Implementation of a Groundwater Monitoring Plan.
- Continued Post-Closure Care of the existing closed RCRA landfill under an Ohio EPA approved Post-Closure Care Plan.
- PCBs in Southern Trenches (AOC-5): Excavate soil with concentrations of PCBs equal to or greater than 9.7 mg/kg at AOC-5 (Southern Trenches Area) and backfill to existing grade.

In addition, the following additional remedial actions for other areas at the Site are proposed:

- ACM: remove surficial ACM, monitor area for exposed ACM as part of the Site Inspection Plan and manage subsurface work in this area through the Risk Mitigation Plan.
- Historically Covered Settling Basin (AOC-2): placement of supplemental soil where existing cover thickness is less than 6 inches thick over settling residuals within AOC-2.

The overall estimated cost of the proposed remedy over the next 20 years is $2,423,000 as summarized below:

Corrective Action:	
Baseline Institutional Controls	$40,000
Landfill Operations, Groundwater Monitoring & Maintenance	$1,700,000
PCBs Removal	$143,000
Other remedial responses:	
Management of ACM in Soil	$40,000
Enhanced cover over historically covered setting basin	$500,000

7. Schedule

Construction and adjustments to the environmental covenants associated with the proposed remedies are anticipated to be implemented and in place within 12 to 18 months of the Ohio EPA's selection of the final Corrective Actions. We note that the implementation of the PCB removal action is planned for 2022. A detailed schedule for proposed corrective measures can be provided upon selection of the of CMS.

References

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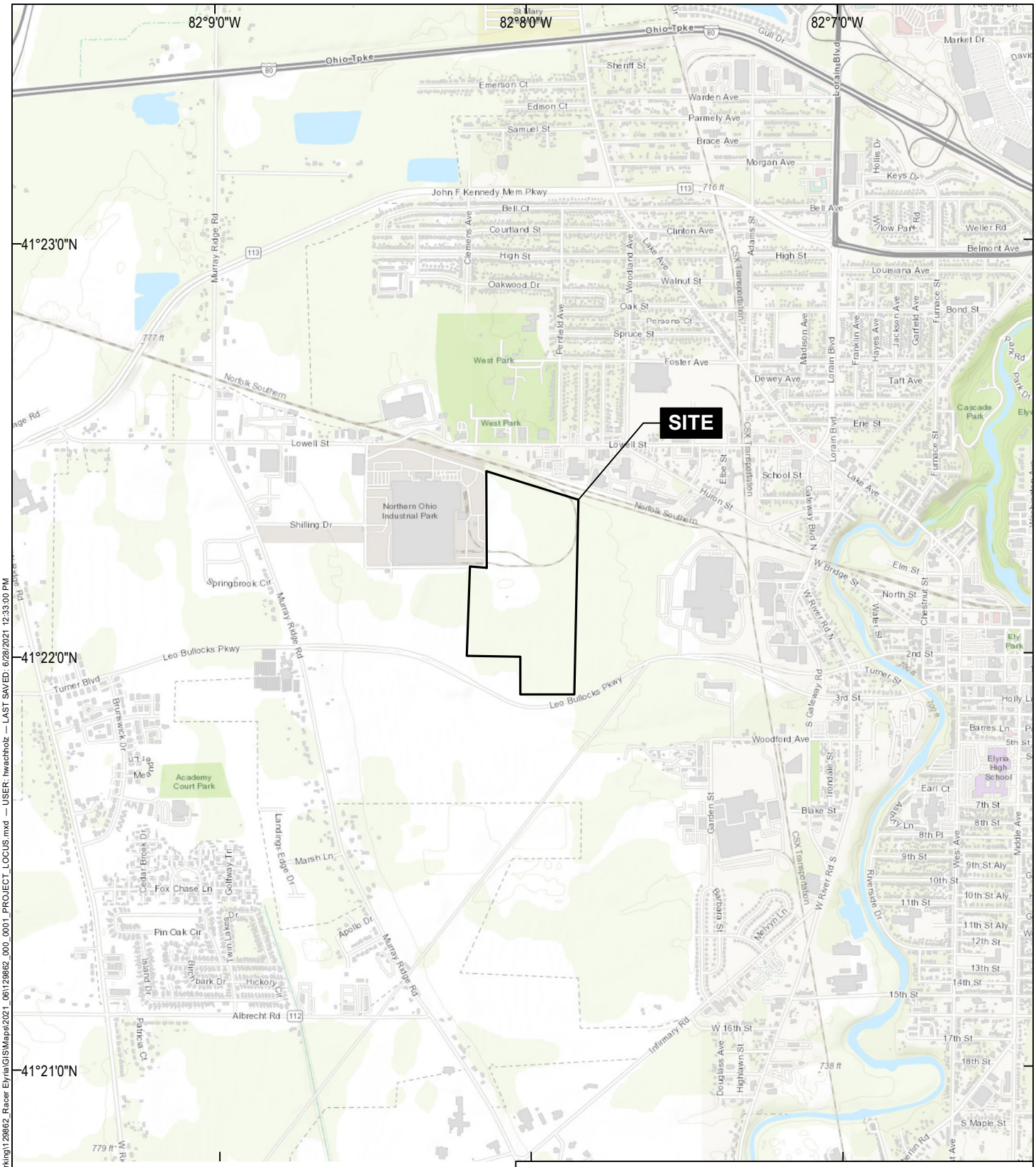
9. United States Environmental Protection Agency (U.S. EPA), Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil [Adult Lead Model (ALM)], EPA-540-R-030001. OSWER 9285.7-54. January 2003.

10. Weston Services, Inc., Post-Closure Plan, Elyria, Ohio Plant, September 1993.

FIGURES



RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

PROJECT LOCUS

MAP SOURCE: ESRI
SITE COORDINATES: 41°22'18"N, 82°7'57"W

APPROXIMATE SCALE: 1 IN = 2000 FT
JUNE 2021

FIGURE 1

GIS FILE PATH: C:\Users\hwachholz\Documents\working\129862_Racer Elyria\GIS\Maps\2021_06\129862_000_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 6/28/2021 12:33:00 PM

AOC 4 - NORTHERN TRENCHES AREA

AOC 1 - OPEN BURN AREA

AOC-8 FORMER FUEL OIL TANK AREA

AOC 2 - NORTHERN SLUDGE AREA

AOC-5 SOUTHERN TRENCHES AREA

AOC-6 NORTHERN DIE STORAGE PAD AREA

AOC-7 SOUTHERN DIE STORAGE PAD AREA

RCRA CLOSED LANDFILL

AOC 3 - SOUTHERN SLUDGE AREA

LEGEND

- AOC-1 OPEN BURN AREA
- AOC-8 FORMER FUEL OIL TANK AREA
- AOC-6 AND AOC-7 FORMER DIE STORAGE PAD AREA
- AOC-2 AND AOC-3 SLUDGE AREA
- AOC-4 AND AOC-5 TRENCH AREA
- RCRA CLOSED LANDFILL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 300 600

SCALE IN FEET

HALEY ALDRICH

RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

SITE PLAN

JULY 2021

FIGURE 2

GIS: C:\Users\hwachholz\Documents\working\129862_Racer Elyria\GIS\Maps\2021_06\129862_000_0002_SITE_PLAN.mxd - hwachholz - 6/28/2021 6:58:38 PM

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AOC-4
NORTHERN TRENCHES
AREA

AOC-8
FORMER FUEL OIL
TANK AREA

AOC-1
OPEN BURN AREA

AOC-2
NORTHERN SLUDGE
AREA

AOC-5
SOUTHERN TRENCHES
AREA

AOC-6
FORMER NORTHERN DIE
STORAGE PAD

AOC-7
FORMER SOUTHERN DIE
STORAGE PAD

AOC-3
SOUTHERN SLUDGE
AREA

LANDFILL

SOUTHERN
TRENCHES AREA

OPEN BURN
AREA

NEXT VOC SOIL SAMPLE
(MW-19) AT
APPROXIMATELY 340 FT

RAILROAD
TRACKS

CONCRETE

CONCRETE
ACCESS ROAD

GRAVEL ACCESS ROAD

WOODED

WOODED

FORMER MW-015
TR-008
TR-005
TR-006
TR-007
SB-206
SB-207
SB-020
TR-009
SB-021
BH84-13
SB-208
BH83-13
BH63-13
BH64-13
SB-205
BH61-13
BH71-13
BH70-13
BH72-13
BH65-13
BH66-13
BH67-13
SB-204
BH68-13
SB-022
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BH205-13
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SB-202
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BH40-13
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TR-002
GP-412
TR-001
BH59-13
GP-308
GP-305
SB-023
GP-424
BH37-13
GP-413
BH205-13
GP-307
BH39-13
GP-306
BH206-13
FORMER MW-016
BH209-13
GP-601
GP-426
BH38-13
BH208-13
GP-602
GP-423
GP-409
GP-603
BH35-13
BH36-13
BH34-13
BH43-13
BH44-13
BH46-13
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BH50-13
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BH210-13
BH201-13
SB-024
BH42-13
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BH88-13
BH89-13
BH90-13
SB-210
GP-401
S3
BH92-13
BH93-13
BH95-13
BH94-13
MW-19
BH10-13
SB-213
BH09-13
S1
BH08-13
BH07-13
BH19-13
BH18-13
BH17-13
BH01-13
BH02-13
BH04-13
BH03-13
S2
BH12-13
BH13-13
SB-212
BH14-13
SB102

LEGEND

- AOC-1 OPEN BURN AREA
- AOC-2 NORTHERN SLUDGE AREA
- AOC-3 SOUTHERN SLUDGE AREA
- AOC-4 NORTHERN TRENCHES AREA
- AOC-5 SOUTHERN TRENCHES AREA
- AOC-6 NORTHERN DIE STORAGE PAD AREA
- AOC-7 SOUTHERN DIE STORAGE PAD AREA
- AOC-8 FORMER FUEL OIL TANK AREA

**LOCATION WITH ONLY DEEPER (> 2 FEET SAMPLE) SHOWN WITH SOLID BORING SYMBOL

N

0 50 100 150 200
SCALE IN FEET

HALEY ALDRICH

RACER TRUST ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

EXPLORATION LOCATIONS

SCALE: AS SHOWN
DECEMBER 2020

FIGURE 3

AOC-2 NORTHERN SLUDGE AREA

AOC-4 NORTHERN TRENCHES AREA

GP-402 AREA

AOC-1 OPEN BURN AREA

S4 AREA

AOC-8 FORMER FUEL OIL TANK AREA

ACM AREA 1

ACM AREA 2

AOC-5 SOUTHERN TRENCHES AREA

PCBs IN SOIL

AOC-6 NORTHERN DIE PAD AREA

BH49-13 AREA

BH43-13 AREA

AOC-7 SOUTHERN DIE PAD AREA

GP-405 AREA

ACM AREA 4

GP-312 AREA

LEGEND

- HOT SPOT AREA POTENTIAL REMOVAL
- PCB IMPACTED AREA
- ACM AREA
- 6-INCH COVER OVER SLUDGE RESIDUAL
- OPEN BURN AREA
- FORMER FUEL OIL TANK AREA
- FORMER DIE STORAGE PAD AREA
- SLUDGE AREA
- TRENCH AREA
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 150 300

SCALE IN FEET

HALEY ALDRICH

RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

AREAS CONSIDERED IN ALTERNATIVES

MARCH 2022

FIGURE 4

GIS FILE PATH: \\haleyaldrich.com\share\cle_common\Projects\129862_Racer Elyria\GIS\Maps\2022_02\129862_000_0003_PROPOSED_ALTERNATIVES.mxd — USER: hwachholz — LAST SAVED: 3/30/2022 4:36:34 PM

GP-428	05/22/18 0 - 2 (ft)
Aroclor-1254	0.56 mg/kg

GP-420	05/22/18 0 - 2 (ft)
Aroclor-1254	0.71 mg/kg

GP-421	05/22/18 0 - 2 (ft)
Aroclor-1254	0.95 mg/kg

Approximately 9,000 sq feet

GP-416	05/22/18 0 - 2 (ft)
Aroclor-1254	36 mg/kg

GP-410	04/10/18 0 - 2 (ft)
Aroclor-1254	23 mg/kg

GP-417	05/22/18 0 - 2 (ft)
Aroclor-1254	2.3 mg/kg

GP-425	05/22/18 1.5 - 2 (ft)
Aroclor-1254	19 mg/kg

GP-407	10/26/17 1.5 - 2 (ft)
Aroclor-1254	10 mg/kg

GP-415	04/10/18 0 - 2 (ft)
Aroclor-1254	3.7 mg/kg

GP-414	04/10/18 0 - 2 (ft)
Aroclor-1254	8.1 mg/kg

GP-411	04/10/18 0 - 2 (ft)
Aroclor-1254	6.6 mg/kg

GP-408	10/26/17 1.5 - 2 (ft)
Aroclor-1254	0.77 mg/kg

MW-016

GP-427	05/22/18 0 - 2 (ft)
Aroclor-1254	0.094 mg/kg

GP-412	04/10/18 0 - 2 (ft)
Aroclor-1254	1.8 mg/kg/1.8 mg/kg

GP-424	05/22/18 0 - 2 (ft)
Aroclor-1254	1.4 mg/kg

GP-419	05/22/18 0 - 2 (ft)
Aroclor-1254	17 mg/kg

GP-413	04/10/18 0 - 2 (ft)
Aroclor-1254	11 mg/kg

GP-418	05/22/18 0 - 2 (ft)
Aroclor-1254	1.2 mg/kg

GP-426	05/22/18 0 - 2 (ft)
Aroclor-1254	0.36 mg/kg

GP-423	05/22/18 0 - 2 (ft)
Aroclor-1254	0.29 mg/kg

GP-409	10/26/17 1.5 - 2 (ft)
Aroclor-1254	0.077 mg/kg

FORMER NORTHERN DIE STORAGE PAD

LEGEND

- 750 — SURFACE CONTOUR/ELEVATION
- RAILROAD TRACKS
- FENCE
- RI/FS MONITORING WELL LOCATION
- SAMPLE PCB CONCENTRATION LESS THAN 9.7 MG/KG
- SAMPLE PCB CONCENTRATION GREATER THAN 9.7 MG/KG
- PROPOSED EXTENT OF SOIL REMOVAL

SITE KEY: NOT TO SCALE

N

0 25 50

SCALE IN FEET

HALEY ALDRICH

RACER TRUST ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

ALTERNATIVE 2
EXTENT OF EXCAVATION
PCBS IN SOIL

SCALE: AS SHOWN
MARCH 2022

FIGURE 5

ROSS, LLOYD Printed: 3/1/2022 12:56 PM Layout: NORTH AREA (2)
G:\129862 RACER ELYRIA\CAD\129862_CMS_PROPOSED_PCBS_20220226.DWG

APPENDIX A
Post Closure Care Plan

Revitalizing Auto Communities
Environmental Response Trust

February 22, 2021

Laurie A. Stevenson, Director
c/o Division of Environmental Response and Revitalization, Engineering and Risk Assessment Support
Attn. Mr. Erik Hagen
P.O. Box 1049
Columbus, Ohio 43216-1049

RE: Petition for Class 2 Modification
Amended Post-Closure Care Plan for Elyria Landfill
RACER Trust Property
U.S. EPA RCRA ID No. 004 201 091
1400 Lowell St.
Elyria, Ohio

Dear Ms. Stevenson:

The Revitalizing Automotive Communities Environmental Response Trust (RACER) is submitting the enclosed *Amended Post-Closure Care Plan for the Elyria Landfill* (PCCP) for the Former General Motors Inland Fisher Guide Division facility located at RACER Trust Elyria Site, 1400 Lowell Street, Elyria, Ohio as a Class 2 modification. The Amended PCCP outlines proposed changes to the leachate removal activities at the closed RCRA landfill in accordance with OAC Rules 3745-55-12, 3745-55-13, 3745-55-18 and 3745-50-51. RACER remains committed to the continued monitoring and maintenance of the landfill to ensure ongoing protection of public health and the environment.

If you have any questions concerning the information presented in the enclosed document, please contact me at 1-855-RACER-411 or by email at pbarnett@racertrust.org.

Sincerely,

Pamela Barnett
Cleanup Manager (DE, LA, MA, OH, PA, VA)
RACER Trust

Enclosure

HALEY ALDRICH

www.haleyaldrich.com

AMENDMENT TO

POST-CLOSURE PLAN FOR RACER ELYRIA

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
RACER Trust
Detroit, Michigan

File No. 129862
February 2021

HALEY & ALDRICH, INC.
6500 ROCKSIDE ROAD
SUITE 200
CLEVELAND, OH 44131
216.739.0555

SIGNATURE PAGE FOR

AMENDMENT TO:
POST-CLOSURE PLAN
RACER ELYRIA
ELYRIA, OHIO

PREPARED FOR
RACER TRUST
DETROIT, MICHIGAN

PREPARED BY:

Ban Aragona
Project Manager
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Lloyd Ross
Principal Consultant
Haley & Aldrich, Inc.

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1. Introduction

This amendment to the Approved Amended Post-Closure Care Plan (PCCP) for the Revitalizing Automotive Communities Environmental Response (RACER) Trust facility in Elyria, Ohio (Site) (December 2015) is proposed in accordance with OAC Rules 3745-55-12, 3745-55-13, 3745-55-18, and 3745-50-51 and will replace the December 2015 PCCP upon approval.

The 2015 PCCP amendment consolidated the original Post-Closure Care Plan which was included in Section F2 of the Closure Plan (May 2014) and the Revised Post-Closure Groundwater Monitoring Plan (April 2007) into a single document. The changes to the 2015 Post-Closure Care Plan included:

- Reduction in frequency of groundwater monitoring from annually to biennially; and
- Changes to the inspection and security frequency.

The changes in this amendment to the 2015 PCCP include:

- A trial period of three years is proposed for exploring the reduction in frequency of leachate extraction events. An evaluation of optimal leachate extraction frequency will be made upon completion of the trial period. During the trial period, a reduction in minimum frequency of leachate extraction events will occur quarterly in the first year of the trial period and biannually (twice per year) or as needed based on the action levels provided in Section 4.5 for the remaining two years of the trial period;
- Addition of regular camera inspection of the landfill drainage tiles;
- Minor revisions for clarification and readability; and
- Removal of the requirement for extraction of secondary sumps when liquid is present.

The following is a summary of the landfill operation and maintenance and groundwater monitoring program described herein:

ELYRIA POST-CLOSURE PROGRAM FOR CLOSED HAZARDOUS WASTE LANDFILL	
O&M and Groundwater Monitoring Activities	
Landfill Cover Inspections	Twice per month or within 5 days of a 2.2 inch 24-hour storm event or snowpack of 10-inch melt within 24 hours
Drain Tile Inspections	Twice per month inspections of critter traps, drainage clearing, and drain tile camera inspections every 5 years
Security	Twice per month fence inspection
Grass Mowing	Four events (from April to October)
Cover Maintenance	As needed
Leachate Removal	Sump levels monitored twice per month
	Extraction quarterly for the first year of the trial period and biannually (twice a year) at a minimum or as needed for the remaining two years of the trial period.*

ELYRIA POST-CLOSURE PROGRAM FOR CLOSED HAZARDOUS WASTE LANDFILL	
O&M and Groundwater Monitoring Activities	
Groundwater Monitoring	Biennial (Every other year with first event in 2016)
Reporting	Biennial (by March 1 the year following groundwater monitoring sampling)

*Action level for more frequent removal defined in Section 4.5 and on the inspection form (Appendix A). Trial period will begin upon approval of this modified PCCP.

The post-closure period for the facility was extended to 2038 as requested in the letter *Petition for Post Closure Plan Amendment* dated 28 August 2014.

1.1 GENERAL SITE DESCRIPTION

The RACER Trust facility is located in Lorain County, Ohio, at 1400 Lowell Street, in the City of Elyria. The plant operated during the time period from 1952 to 1988. Operations at the Site ceased in July 1988. The location of the facility is presented in Figure 1.

During the course of conducting Site closure activities, the Site's RCRA treatment, storage, and disposal units were closed in accordance with Ohio Environmental Protection Agency (Ohio EPA) and or U.S. EPA approved plans and specifications. These closed units included three sludge dewatering surface impoundment units. In 1988, closure of the surface impoundment units was accomplished by removing all hazardous wastes and contaminated soil in accordance with the approved closure plan and disposing of those materials in an onsite landfill disposal unit. This landfill disposal unit was designed and constructed in accordance with RCRA standards and in accordance with Ohio EPA and U.S. EPA-approved closure plans. Following receipt of all surface impoundment closure wastes, the landfill was capped and closed. The landfill disposal unit is located on an approximate 95-acre parcel of land that is currently owned by the RACER Trust. Figure 2 depicts the location of the landfill unit with respect to the 95-acre land parcel.

1.2 LOCATION INFORMATION

The Site is located in an industrial, commercial, and agricultural area approximately 25 miles southwest of Cleveland, Ohio. The landfill is bounded to the west by the former General Motors Inland Fisher Guide Division Plant, which is currently used for commercial/industrial purposes. Vacant industrial and agricultural properties bound the landfill to the southwest, south, and east. A railway right-of-way separates the Site from additional commercial and industrial properties farther to the north.

1.3 GROUNDWATER MONITORING PLANS

Groundwater detection monitoring was performed at the Site under an approved Groundwater Monitoring Plan (September 1993) consistent with 40 CFR 270.14(c), 40 CFR 265 Subpart F, and OAC Chapter 3745-65 for an Interim Status facility. The Groundwater Monitoring Plan (September 1993) was approved by the Ohio EPA on 6 January 1994. A modified post-closure plan was requested by the Director of the Ohio EPA in 2001, which would conform to the post-closure requirement for groundwater monitoring and cap maintenance under OAC Chapters 3745-54 and 3745-55. The goal of the request was to meet Government Performance and Results Act (GPRA) post-closure requirements

for the Site by having "an approved control in place." The Revised Post-Closure Groundwater Monitoring Plan (2001) was revised to include:

- Installation of new background monitoring wells;
- A revised list of Site-specific monitoring parameters;
- Statistical analysis consistent with OAC 3745-54-98 (Detection Monitoring Program); and
- OAC 3745-54-97 (General Ground Water Monitoring Requirements), which consisted of inter-well comparisons of downgradient to upgradient wells.

A proposed Revised Post-Closure Groundwater Monitoring Plan (March 2004) introduced several changes based on a review of Site data. The Ohio EPA requested that the proposed Post-Closure Groundwater Monitoring Plan (March 2004) be revised to include a reduction in monitoring frequency to once per year; evaluation of the Site-specific monitoring parameters that currently have Maximum Contaminant Levels (MCLs); and no other evaluation of any analytical data including statistical comparison and comparison to Alternate Concentration Limits (ACLs).

The Revised Post-Closure Groundwater Monitoring Plan (April 2007) was approved by Ohio EPA on 10 October 2008 and Ohio EPA's clarified approval was provided on 3 December 2008. The Approved Amended Post-Closure Plan (last amended in October 2008) and associated Revised Post-Closure Groundwater Monitoring Plan (April 2007) were consolidated into the December 2015 Post-Closure Plan with the following changes:

- Reduction in frequency of groundwater monitoring from annual to biennial; and
- Changes to the inspection frequency.

The December 2015 Post-Closure Care Plan was approved in a letter dated 29 December 2015. Upon approval this plan will replace the 2015 Post-Closure Care Plan.

1.4 LANDFILL EVALUATION

In 2020, Haley & Aldrich evaluated the potential interaction between water within the landfill and the surrounding groundwater at the Site. The evaluation was conducted based on observed increased leachate volume extracted during the first quarter of 2019 and the similar groundwater elevations observed within the Site monitoring wells and the landfill's primary sumps during the 2018 Groundwater Monitoring event. The evaluation included inspection of the upper landfill cap and surface drainage network and monitoring groundwater elevation data from Site monitoring wells and leachate elevation data from primary landfill sumps for a period of 80 days.

The results of the cap evaluation indicated that the cap and surface drainage system were in good condition. Grates were added to the exposed drainage pipe outlets to prevent burrowing animals from entering the system. Hydraulic data collected both manually and with transducers indicated that there was no evidence of a connection between groundwater and the leachate sumps. The results of the landfill evaluation were submitted to the Ohio EPA in the RACER Elyria Landfill Memorandum dated 4 September 2020, and provided in Appendix B.

2. Landfill Background

The following information is based on details from the approved Post-Closure Plan (December 2015) and subsequent improvement activities.

2.1 GENERAL

The Site landfill was constructed in 1988 as part of the closure of three surface impoundments previously used for the handling of sludge from the former General Motors Inland Fisher Guide Division Plant wastewater treatment system, which operated in the western area of the Site. The sludge was originally generated from copper, nickel, and chrome electroplating operations.

The landfill disposal unit was designed and constructed for the sole purpose of achieving effective closure of the surface impoundment units at the facility. The only hazardous waste placed in any of the surface impoundments was the F006 electroplating sludge as described above. Therefore, the wastes placed in the landfill unit consist of CKD-stabilized sludge and contaminated impoundment-bottom soils containing waste constituents of the sludge, and the impoundment dewatering system components.

Based on analytical sample results of the un-stabilized sludge, the sludge was classified as an F006 hazardous waste, but was not characteristically hazardous with regard to pH, flashpoint, corrosivity, or reactivity. Analytical results for the sludge are presented in the Post-Closure Groundwater Monitoring Plan (September 1993). The analytical results documented detectable concentrations of chromium, copper, nickel, and zinc in the un-stabilized sludge. Leachable concentrations of chromium, nickel, and silver were also reported. In addition, detectable concentrations of carbon disulfide, methylene chloride, and trichloroethene were also detected in the sludge.

Each of three surface impoundments contained approximately 13,000 cubic yards of sludge, for a total sludge volume of approximately 40,000 cubic yards. To stabilize and solidify the sludge, approximately 8,800 tons of cement kiln dust (CKD) was added. The landfill was also utilized for the disposal of approximately 1,200 cubic yards of underlying contaminated soils. Thus, the total estimated volume of materials placed in the landfill unit is approximately 50,000 cubic yards. The landfill unit is closed and will not receive any additional wastes.

2.2 LINER SYSTEM DESCRIPTION

The landfill disposal unit was constructed within the limits of sludge impoundment Nos. 1 and 2. The landfill disposal cell was designed with an integrated primary and secondary liner system. Construction of the landfill components was performed under a rigorous construction quality assurance (CQA) program that verified compliance with design performance and material specifications. Specifically, the primary and secondary liner system consists of the following components listed in ascending order from the cell foundation:

2.2.1 Primary Liner

- A 40-mil HDPE membrane liner;
- A high-density polyethylene (HDPE) "geonet" synthetic drainage layer; and
- A geotextile filter fabric layer.

2.2.2 Secondary Liner

- A 36-inch-thick, low permeability ($1x10^{-7}$ cm/sec) recompacted clay layer;
- A 40-mil HDPE membrane liner; and
- An HDPE "geonet" synthetic drainage layer.

This liner system extends throughout the entire bottom and sidewalls of the cell and is keyed into the multi-layered top cover system to eliminate any infiltration of precipitation or runoff. A cross-section of the bottom liner system is presented on Sheet 4 of the 1988 as-built construction drawings.

2.2.3 Liner Systems Foundation Description

Prior to installation of the re-compacted soil and synthetic liner components, the cell foundation was constructed. The existing natural soils beneath the excavated impoundments were graded and roller-compacted to form an even working surface as well as to provide the design specified bottom slopes for the cell.

A sub-base layer was installed following initial grading and compaction of the foundation. This sub-base was constructed by compacting sandy clay obtained from the offsite borrow area. It was proof-rolled with a drum roller to detect any soft or undesirable areas before placement of the first clay liner lift. The 8-inch sub-base was constructed to provide a stable and uniform surface beneath the 36-inch compacted clay component of the secondary liner system.

2.2.4 Leachate Collection/Detection System Operation and Design

Primary and secondary leachate detection/collection systems were installed in the sludge disposal cell. The primary system collects leachate present above the primary HDPE liner, and the secondary system will detect and collect leachate present above the secondary HDPE liner, in the event that there is leakage or failure of the primary liner system.

Both systems utilize four collection sumps located at the perimeter base of the cell. Conveyance of leachate to the sumps is accomplished by the slope of the bottom of the cell towards each sump and by the high transmissivity of the synthetic geonet layer.

The four primary collection sumps are 42-inch-diameter, precast concrete, vertical risers that extend from the cell floor above the primary liner, through the stabilized waste and cover system, to the surface of the landfill. The four secondary leachate collection sumps are located beneath the primary sumps.

Formerly, automatic, level-actuated, submersible sump pumps installed in the four primary sumps were used to detect and remove leachate when the sump liquid levels exceeded a predetermined set point. Leachate was pumped through conveyance pipes that connected the risers to former storage tanks located above-grade, adjacent to the disposal cells. These two 1,000-gallon tanks were located at grade adjacent to the north and south sides of the cell to serve as short-term storage units (less than 90 days) for collected leachates. The above-ground tanks were provided with a secondary containment system that included a continuously bermed, 12-inch, reinforced concrete pad underlain by a 6-mil polyethylene liner.

Based on changes in operations, the tanks were no longer required to manage the leachate from the landfill and were decontaminated in May 2017 to allow for generator closure and removal of the tank system from the Site. The decontamination of the tank system was completed in accordance with

performance standards in Ohio Administrative Code (3745-66-11), as discussed in the Tanks Closure Memorandum (Haley & Aldrich, 2018) (Appendix C). After decontamination, the tanks, secondary containment pads, buildings, and associated equipment were demolished and removed from the Site for disposal.

Leachate is currently removed from the sumps via a direct transfer of the leachate from each primary collection sump to a tank truck that travels on an access road constructed for this purpose. Leachate is pumped from each primary collection sump to the tank truck and then taken to an acceptable permitted offsite treatment or disposal facility. Leachate extraction events will be scheduled when leachate levels rise to within 90 percent of their corresponding action level as defined in Section 4.5 below, or biannually, at a minimum, as discussed in Section 4.5.

2.2.5 Run-on Control System

Primary run-on control for the landfill area is currently provided by the above-grade construction of the landfill unit. The landfill grades are approximately 12 to 15 feet above surrounding grades. Surrounding areas are adequately drained by existing drainage patterns.

During the active period of the landfill, the cell was surrounded by berms in order to prevent run-on. Rainwater that fell directly on the decontaminated excavation prior to waste placement was managed as stormwater. Rainwater that accumulated in the containment cell after waste placement was collected and managed as a hazardous waste by pumping from the leachate collection system directly to the plant wastewater treatment facility for treatment.

2.2.6 Runoff Control System

Runoff from the landfill during active operations was collected within the cell and managed as leachate. Following closure of the landfill cell, runoff is managed by uniform sheet flow across the vegetated cover system and conveyed to perimeter drainage swales. Perimeter drainage swales direct runoff to existing onsite drainage swales.

Due to a higher-than-expected volume of leachate generation, post-closure maintenance was performed on the perimeter drainage swales and letdowns in 2008 to 2009 to reduce stormwater infiltration into the landfill. The leachate generation of the landfill decreased by over 90 percent after completion of the maintenance on the stormwater system.

2.2.7 Control of Wind Dispersal

The moisture content of sludges was utilized as a primary means to control wind dispersal during active landfill operations. During the post-closure period wind dispersal will not occur since no waste will be exposed by maintaining the existing cover.

3. Geologic and Hydrogeologic Conditions Summary

This section describes the geology and hydrogeology as summarized in the Approved Closure Plan.

3.1 REGIONAL STRATIGRAPHY

Lorain County is located on the eastern fringe of the till plain of the Great Central Lowlands. The topography within the vicinity is relatively flat to gently rolling. The landfill has an approximate elevation of 750 feet above mean sea level. The general area was subject to Wisconsinan glaciation, leaving a thin layer of drift material known as the Hiram Till over the southern two-thirds of Lorain County and lacustrine silty clay across the northern one-third of the county. The drift material consists of clay-rich soil up to 25 feet in thickness. Elyria lies on glaciated, lake plain deposits and beach ridges of Old Lake Whittlesey, Lake Maumee, and Lake Warren (Stout et al., 1943). The area is located near the eastern boundary of the till plain area of the Central Lowland physiographic province.

The bedrock underlying Lorain County consists of relatively flat-lying sedimentary strata and includes the upper Devonian and lower Mississippian Cleveland Shale, Bedford Shale, Berea Sandstone, and Cuyahoga Shale. Bedrock dips slightly to the south or southeast. The most important bedrock aquifer in Lorain County is the Berea Sandstone, which typically yields 3 to 10 gallons per minute under long-term withdrawal (Barber, 1988).

3.2 SITE STRATIGRAPHY

There are three main stratigraphic units at the Site: proceeding from the surface downwards are drift deposits (clay till), Berea Sandstone, and Bedford Shale. All three stratigraphic units are laterally continuous beneath the landfill. The till unit is comprised of soft, silty clay till that varies from light brown to greenish gray and ranges in thickness from 8 to 15 feet. The Berea Sandstone, referred to as the bedrock unit, is comprised of a hard, fine-grained sandstone with occasional thin interbedded shale units. The top of the Berea Sandstone is encountered at an approximate depth of 8 to 15 feet below ground surface (bgs). The Berea Sandstone is thickest (23 feet thick) in the northwestern portion of the Site. The Bedford Shale is comprised of a silty shale with some thin sand horizons and varies in color from gray to reddish gray. No borings penetrated the full thickness of the Bedford Shale beneath the Site, but the Bedford Shale is estimated to be 50 to 90 feet thick in the vicinity of the Site based on background literature. The Bedford Shale has a lower permeability overall than the Berea Sandstone aquifer and is considered a confining unit for the Berea Sandstone aquifer. Onsite borings that partially penetrate the Bedford Shale indicate that no map-able sandy horizons exist within the shale for at least 10 feet below the Berea Sandstone (Simon Hydro-Search, 1992). Boring logs are presented in Appendix D.

3.3 GROUNDWATER FLOW DIRECTION

Based upon the groundwater elevation data provided in a hydrogeologic investigation conducted by CRA in 2001, it is likely that a hydraulic connection exists between the till unit and the underlying bedrock aquifer unit. The two monitoring units for the landfill are: (1) the Bedrock Unit; and (2) the Till Unit. For the purposes of monitoring, the Bedrock Unit and the Till Unit are considered two distinct units in the current plan and the previously approved plan.

Representative groundwater elevations from April 2015 and contours for the Bedrock Unit and the Till Unit are presented on Figure 3 and Figure 4, respectively. Based on groundwater measurements made during monitoring of the landfill and the remedial investigation, groundwater flow beneath the landfill within the bedrock and till units is predominantly to the northeast.

The hydraulic conductivity of the Bedrock Unit is estimated to be 0.2 feet/day (Weston, 1993). Based on the estimates of hydraulic conductivity for the Bedrock Unit, the flow velocity is estimated to be 12 feet per year.

3.4 GROUNDWATER USE WITHIN THE VICINTY OF THE SITE

Ten offsite wells have been identified within one mile of the Site based on a search of Ohio Department of Natural Resources (ODNR) well logs. The closest well is approximately 0.6-mile to the northwest of the Site.

Areas within the City of Elyria have access to the public water supply including the area within the vicinity of the Site. The City of Elyria obtains its water from Lake Erie. Installation of private potable water supply wells is discouraged by the permitting and approvals process, and associated costs of installing, operating, and maintaining a private water supply well. Some locations within Lorain County may also experience issues regarding taste and odor, which also discourages private water well installation.

3.5 PRECIPITATION

The Site is located approximately 25 miles southwest of Cleveland, Ohio. Elyria experiences a continental climate with strong modifying influences due to the presence of Lake Erie. Summers are moderately warm and humid. Winters are cold and cloudy with the average temperatures in December, January, and February below freezing. Consistent with a continental climate, precipitation can vary widely; however, it is normally abundant and well distributed over the year.

3.6 SURFACE WATER

There is no known groundwater discharge to surface water in the immediate vicinity of the Site. However, groundwater flow north of the landfill is influenced by storm sewers. Intermittent flow has been observed in the Site drainage ditches after precipitation events.

The nearest surface water body is the Black River located less than one mile to the east of the Site.

4. Post-Closure Plan

4.1 POST-CLOSURE CONTACT

The contact for questions regarding the facility during the post-closure period is:

Cleanup Manager – Ohio
c/o RACER Trust
1505 Woodward Avenue
Suite 200
Detroit, Michigan 48226
Phone: 1-855-RACER-411

4.2 POST-CLOSURE SECURITY

Post-Closure security and Site access control will be provided by a seven-foot industrial mesh fence surrounding the property area. Access to the property area is provided by authorized entry through a locked personnel and equipment access gate. Railcar access through the Site is obtained via two railroad gates. In the event that access to the Site is required by authorized personnel, the post-closure contact should be notified, and appropriate access arrangements will be made by RACER Trust.

In addition, inspections of the Site and fence will be conducted at least twice monthly to identify any trespassing or damage to the fence as described in Section 4.4.

This post-closure security system is anticipated to provide adequate access control. Further, since all wastes are encapsulated by the multi-layered landfill liner and cover systems, unknowing access to the area or trespassing is not believed to pose a hazard to human health.

4.3 SYSTEM DESIGN DESCRIPTION

This subsection presents an overview of the system design components and inspection and maintenance requirements associated with the system.

4.3.1 Leachate Collection/Detection System

The leachate collection/detection system is comprised of eight in-cell sumps; the four primary and four secondary sumps are located in pairs along the bottom perimeter of the sloped containment cell. The primary sumps collect leachate present above the first synthetic bottom liner, and the secondary sumps collect liquid present above the second synthetic liner. See Section 2.2.4 for a more detailed description of leachate removal activities.

4.3.2 Gas Venting System

The design and installation of the landfill disposal unit does not have a gas venting system. The primary wastes placed within the cell are inorganic and therefore are not expected to produce decomposition gases that would necessitate a gas venting system.

4.4 INSPECTION PLAN

The following inspection program will be implemented by RACER Trust to ensure continued integrity and effective performance of the landfill disposal unit containment systems and appurtenances throughout the post-closure period. Detailed inspection sheets to be utilized in implementing this inspection plan are presented in Appendix A. In general, and unless otherwise stated, the following will be inspected twice a month:

- Security control devices;
- Erosion damage;
- Cover settlement, subsidence, and displacement;
- Vegetative cover condition;
- Integrity of run-on and runoff control measures;
- Cover drainage system functioning;
- Leachate collection/detection and removal system;
- Well condition; and
- Benchmark integrity.

RACER Trust will contract with qualified personnel to conduct these inspections and transmit appropriate documentation and accurate assessments to the RACER Trust post-closure contact.

Inspection forms discussed below will be provided to Ohio EPA by the 5th of every month for the prior month's inspections. Copies of completed inspection sheets are maintained in the office of the post-closure contact. These inspection log sheets are maintained chronologically. All inspection records are kept until the completion of the post-closure care period.

4.4.1 Landfill Cover System Inspection

The cover system for the closed landfill disposal unit will be inspected to detect signs of:

- Excessive or differential settlement and subsidence;
  Observation of ponding water during more than one consecutive inspection may be an indication of subsidence. If subsidence is determined to be the issue, appropriate corrective actions will be implemented.
- Soil erosion;
- Inadequate, sparse, or stressed vegetative cover; and
- Impact to cover system integrity by burrowing animals or deep-rooted vegetation.

4.4.2 Stormwater Management System Inspection

The landfill disposal unit run-on and runoff control structures will be inspected to detect:

- Conditions which may cause erosion or piping of cover soils;
- Blockage or excessive sedimentation of drainage structure which may induce backup or ponding of stormwaters; and
- The system piping entrances will be visually inspected twice per month for obstructions and every five years with a camera for the presence of obstructions and deformation.

4.4.3 Groundwater Monitoring System Inspection

The groundwater monitoring well network at the facility will be inspected to detect for:

- Well protective casing lock function;
- Protective casing and well apron integrity;
- Presence of legible well identification number; and
- Well conditions during post-closure sampling.

4.4.4 Leachate Detection/Collection System Inspection

The leachate detection/collection system will be inspected to:

- Detect changes in primary sump liquid levels;
- Determine when an extraction event is necessary.

4.4.5 Security System/Benchmarks

The security system at the Site will be inspected to determine:

- Condition of warning signs;
- Perimeter fence condition; and
- Gate and lock condition.

In addition, surveyed benchmarks will be inspected to verify their integrity.

4.5 LEACHATE DETECTION/COLLECTION SYSTEM MONITORING AND LEACHATE REMOVAL

Monitoring leachate generation volumes collected by the primary sump system will be utilized as a means for detecting potential cover system failure. In this manner, any unusual changes in leachate volumes collected will be evaluated as an indicator of possible cover system failure.

The secondary leachate detection/collection system has been designed as a system to provide early warning of potential failure of the primary landfill liner system. Therefore, RACER Trust will provide routine monitoring of this secondary leachate detection system throughout the post-closure period.

The four secondary sumps are situated between the primary and secondary synthetic liners. An evaluation conducted by CRA in 2003 indicated that connectivity between the primary and secondary sumps was evident. Therefore, it is unlikely that the secondary sumps will be void of liquid and will be monitored or pumped during extraction events. The sumps are designed to collect leachate that is intercepted by the secondary liner. A water level meter will be used to determine if liquid is present in the secondary sump. If liquid is detected in the secondary sump the liquid level will be recorded on the Inspection Log.

Each of the primary sumps in the leachate detection/collection system will be monitored for the presence of leachate at least twice per month during routine inspections. Leachate removal from the primary sumps will be conducted when the leachate rises to 90 percent of the action levels defined below or biannually at a minimum. In addition, based on an evaluation of the construction drawings in the *Closure Certification Report* (Weston Services, Inc., September 1988), the position of the primary

liner/drainage in each of the primary sumps was estimated. If water levels exceed this level during a bimonthly inspection, then additional leachate removal will be conducted within 48 hours.

The actions levels that are included on the inspection form are listed in the table below:

Primary Sump	Depth to Water (ft)	Depth to Water - Leachate Removal Action Level (ft)	Approximate Water Thickness in Sump (ft)	Approximate Water Thickness in Sump - Leachate Removal Action Level (ft)
Northwest	13.2	11.9	4.2	3.8
Northeast	13.4	12.1	5.0	4.5
Southwest	13.7	12.3	2.6	2.3
Southeast	12.4	11.2	4.0	3.6

4.6 MAINTENANCE PLAN

This subsection describes preventative and corrective maintenance procedures, anticipated equipment requirements, and material needs during the post-closure period. RACER Trust anticipates that the inspections described in Section 4.4 can result in any determinations for a particular item:

1. Acceptable condition;
2. Unacceptable condition-nonemergency (preventative) maintenance; and
3. Unacceptable condition-emergency (corrective) maintenance.

The "acceptable condition" status requires no repair before the next inspection. "Unacceptable condition-nonemergency maintenance" indicates that repair is needed to avoid further damage and perhaps to avoid the need for emergency repairs. In this case, maintenance will be performed as soon as possible. Any item that qualifies as "unacceptable condition-emergency maintenance" will receive immediate attention. The inspector will notify the RACER Trust post-closure contact or other designated person of any repair requirements; RACER Trust will then initiate the appropriate corrective maintenance or repair.

Specific approaches to maintenance of the landfill system components are outlined below.

4.6.1 Landfill Cover System Maintenance

Timely action will be taken by RACER Trust upon detection or notification of any cover system maintenance needs. RACER Trust anticipates that maintenance activities may include, but not be limited to:

- Routine, periodic mowing of vegetative cover or when vegetation has reached 6 inches or more in height;
- Placement of additional cover soils to correct areas of erosion or settlement; and
- Re-vegetation and mulching to re-establish adequate vegetative growth.

The vegetative cover will be mowed up to four times annually during the growing season (from April to October) to prevent the growth of woody or deep-rooted vegetation. The final cover of the landfill unit will be maintained at the approximate slopes and grades specified in the closure plan.

4.6.2 Stormwater Management System Maintenance

The runoff control structures for the landfill disposal unit, including perimeter stormwater diversion channels and swales will be maintained to ensure intended performance. Maintenance activities that may be required for stormwater management structures include, but may not be limited to:

- Removal of excess sediments or other blockage of drainage channels;
- Replacement of channel linings as necessary; and
- Re-vegetation and mulching to re-establish vegetative growth within the drainage channels.

The vegetative growth within the drainage channels and swales, which are not lined with riprap, will be mowed at least annually to facilitate flow and reduce the occurrence of siltation, while maintaining resistance to erosion and excessive flow velocities.

4.6.3 Groundwater Monitoring System Maintenance

During each sampling event, monitoring wells will be inspected to ensure integrity of the monitoring system. Monitoring well inspection will include:

- Ensure that the well identification number is present;
- Check for the presence and condition of the lock;
- Check the condition of the protective casing (i.e., heavily rusted, dented);
- Inspect the integrity of the concrete runoff diversion apron; and
- Sound the bottom of the well to determine the accumulated thickness of sediment within the well.

A monitoring well inspection log will be maintained documenting the condition of the wells. If it is determined that corrective measures are necessary, the following maintenance activities may be required:

- Painting of protective casings to reduce rust damage;
- Replacement of locks, protective casing or runoff diversion aprons;
- Redevelopment of silty wells; and
- Replacement of damaged or nonfunctioning wells

Criteria for implementing the first two corrective measures will be primarily based on visual observations and good judgment. The decision to redevelop a monitoring well will be based on the quantity of sediment accumulation. A well will be redeveloped if the accumulated sediment thickness exceeds one-third of the length of the screen or is equal to and/or exceeds the height of the water column in the well. Redevelopment procedures will be in accordance with accepted protocols outlined in the Ohio EPA Technical Guidance Manual for Hydrogeologic Investigations and Groundwater Monitoring (February 2009). A monitoring well will be abandoned and completely replaced if the structural integrity of the well casing has been damaged to the point of inhibiting sample collection or compromising sample integrity, or if redevelopment of silted wells does not improve the yield of the well, thereby inhibiting sample collection.

4.6.4 Leachate Detection/Collection System Maintenance

Surface components of the primary and secondary leachate detection/collection system including storage tanks, berms, and buildings were removed in 2017, as discussed in Section 2.2.4. Therefore, RACER Trust anticipates that only limited maintenance requirements for this system may include:

- Maintaining above-grade concrete structures associated with the primary sumps;
- Maintaining above-grade piping associated with the secondary sumps; and
- Maintaining the road to allow for ease of access for leachate removal.

Specific maintenance work orders will be conducted based upon notifications presented on the inspection logs maintained for the system.

4.6.5 Security System/Benchmark Maintenance

The security system will be maintained by repairing or replacing damaged fencing, gates, or locks as needed to ensure the integrity of the system. Surveyed benchmarks will be maintained to prevent damage or disturbance.

4.7 PERSONNEL TRAINING

It is anticipated that RACER Trust will contract with outside firms to implement specific post-closure activities related to inspection, monitoring, and maintenance of the landfill disposal unit. Contractors responsible for conducting these activities will report directly to the RACER Trust post-closure contact. Contractors and RACER Trust personnel who may be associated with post-closure activities at the Site will be trained in accordance with the training plan outlined herein. Contractor personnel will maintain proficient knowledge of this training program content as a stipulation of their contracted work scope. Monitoring requirements, including sampling, analysis, and reporting are anticipated to be conducted by an independent contractor or analytical laboratory. Further, well redevelopment and/or replacement, if required, will be conducted by a qualified contractor under the direction of RACER Trust.

Post-Closure leachate management (i.e., removal, transport, and off-site treatment) will be accomplished through an appropriately qualified and licensed transport and disposal contractor.

4.7.1 Purpose of Training Program

The purpose of this training program is to define the operating principles and regulatory framework under which the post-closure activities at the facility are to be accomplished. The objectives of the training program include:

- Identify and familiarize contractor and RACER Trust personnel with specific requirements pertaining to the closed waste management unit.
- Develop and maintain the proficiency of contractor and RACER Trust personnel carrying out tasks related to post-closure inspection and maintenance.

The training program will provide varying degrees of training for individuals based on their scope of work, function, and responsibilities. The training program will be modified, as deemed necessary, when changes in facility operation occur, or when required by local, state, or federal regulations.

4.7.2 Implementation of Training Program

All designated contractor and RACER Trust personnel will complete the training program prior to participating in work scope activities associated with the Site post-closure tasks. Contractor personnel will participate in an initial training and annual refresher training, pertinent to their post-closure scope of work. Refresher training may be in the form of written guidance or standard operating procedures issued to contractor personnel.

4.7.3 Content of Training Program

The following outline will be followed in RACER Trust's administration of the contractor training program.

I.) General Site Location/Background Information
   a) Site conditions/location
   b) Site access
   c) Hazardous wastes disposed at the Site

II.) Regulatory Requirements
   a) General post-closure inspection, monitoring, and maintenance
   b) Impacts to contractor work scope

III.) Documentation and Reporting
   a) Use of inspection sheets
   b) Communications with RACER Trust post-closure contact
   c) Frequency/schedule for inspection and reporting

IV.) Recognizing Maintenance Needs
   a) Emergency vs. Non-emergency
   b) Interpretation of Site conditions
   c) RACER Trust authorization for maintenance work

4.8 NOTICE TO LOCAL LAND AUTHORITY

A survey plat, indicating the location and dimension of the closed landfill disposal unit, has been submitted to the local zoning authority concurrent with the submittal of the previous post-closure permit application. This survey plat was prepared with respect to permanent benchmarks and has been certified by a licensed professional land surveyor.

4.9 NOTICE IN DEED

A notice has been filed in the deed to the facility property, that will, in perpetuity notify any potential purchaser of the property that: (1) the land has been used to manage hazardous wastes; (2) its use is restricted; and (3) the survey plat and record of the type, location, and quantity of hazardous wastes disposed of has been filed with the local zoning authority or the authority with jurisdiction over local land use and with the U.S. EPA and the Ohio EPA.

4.10 POST-CLOSURE ESTIMATE

A part of the settlement of the General Motors Corporation bankruptcy, a remediation cost estimate was estimated and agreed upon by both lead agency (Ohio EPA) and support agency (U.S. EPA). On 31 March 2011, this agreed upon amount of $2,634,063 was set aside specifically for the facility. This estimate included costs associated with post-closure care and monitoring of the landfill through 2038. It

also included funds associated with RCRA Corrective Action for the remainder of the solid waste management units (SWMUs) located on the RACER Trust parcel.

5. Post-Closure Groundwater Monitoring Plan

This section represents the amended monitoring locations, analytical methods, sampling frequency, and other pertinent information for the Site groundwater monitoring program.

5.1 MONITORING WELL NETWORK

The Revised Groundwater Monitoring Plan (April 2007) identified 18 monitoring wells to be sampled annually. These wells are divided into two groups according to geographic unit:

- Till Unit wells: P-02T, P-03T, P-08T, P-12TR, P-14T, P-15T, P-16T, P-18T, and P-21T; and
- Bedrock Unit wells: P-02, P-03R, P-08R, P-12, P-14, P-15, P-16, P-18, and P-21.

In addition, the following locations are considered piezometers in the monitoring network:

- Three piezometers in the Till Unit (P-1T, P-11, and P-13T); and
- Five piezometers in the Bedrock Unit (P-1, P-13, P-17, P-19, and P-20).

The following locations are also included in the monitoring program:

- Four primary sumps (northeast, northwest, southeast, and southwest); and
- Four secondary sumps (northeast, northwest, southeast, and southwest).

The monitoring well network for groundwater monitoring will include the following monitoring wells:

- West side (up-gradient): monitoring wells
    1. P-12TR (till);
    2. P-12 (bedrock);
    3. P-14T (till);
    4. P-14 (bedrock);
    5. P-15T (till); and
    6. P-15 (bedrock).

- Northeast corner (down-gradient): monitoring wells
    7. P-08T (till);
    8. P-08R (bedrock);
    9. P-21T(till);
    10. P-16T (till);
    11. P-16 (bedrock); and
    12. P-21 (bedrock).

- Southeast corner (down/side-gradient): monitoring wells
    13. P-03T (till);
    14. P-03R (bedrock);
    15. P-02T (till);
    16. P-02 (bedrock);
    17. P-18T (till); and
    18. P-18 (bedrock).

These monitoring wells will be used to monitor groundwater quality and groundwater elevations.

In addition, the following locations are considered piezometers in the monitoring network and will be used to monitor water elevations:

- Three piezometers in the Till Unit (P-1T, P-11 and P-13T); and
- Five piezometers in the Bedrock Unit (P-1, P-13, P-17, P-19, and P-20).

5.2 SITE–SPECIFIC PARAMETERS

Consistent with the2007 and 2015 groundwater monitoring plan, the site-specific groundwater monitoring parameters for the Site are:

- Barium (waste-indicator parameter);
- Select additional metals (calcium, chromium, iron, magnesium, manganese, nickel, potassium, and sodium);
- Total cyanide; and
- Chloride and sulfate.

5.3 MONITORING FREQUENCY

For 16 years of monitoring (2004 to 2020), no parameter concentrations above groundwater quality criteria (MCLs) were observed in any of the monitoring wells at the RCRA landfill. This indicates that a long-term in-compliance situation exists regarding groundwater quality surrounding the RCRA landfill. A variety of decreasing trends over time were observed for certain parameters at certain wells. A lower number of increasing trends were also observed, most of which occur at monitoring well nest P-02T/P-02. Most of the data sets considered did not exhibit any trend in parameter concentrations over time.

Due to these trend findings and the maturity of the monitoring program, it is appropriate to reduce the frequency of groundwater sampling at the Site to biennial sampling from annual sampling.

5.4 MONITORING PROGRAM SUMMARY

The table below summarizes the groundwater monitoring program. The monitoring well, piezometer, and sump locations are presented on Figure 2. A full round of groundwater elevations for the monitoring wells, piezometers, and sumps will also be measured on a biennial basis. Following five sampling events, the water level monitoring program will be evaluated to determine if any revisions to the water level program are appropriate.

Biennial Groundwater Monitoring Plan Summary

LOCATION	ANALYTE LIST
Monitoring Wells	Barium, calcium, chromium, iron, magnesium, manganese, nickel, potassium, sodium, total cyanide, chloride, and sulfate
Till Contact Unit	
P-02T, P-03T, P-14T, P-15T, P-16T, P-21T, P-08T, P-18T, and P-12TR	
Bedrock Aquifer Unit	
P-02, P-03R, P-12, P-08R, P-14, P-15, P-16, P-18, and P-21	
Piezometers	Water levels only
Till Contact Unit	
P-1T, P-11, and P-13T	
Bedrock Aquifer Unit	
P-1, P-13, P-17, P-19, and P-20	

5.5 FIELD AND ANALYTICAL METHODS

This section presents field methods for water level measurements, well depth measurements, well inspection, well evacuation, sample collection, sample preservation, sample shipment, documentation requirements, quality assurance/quality control (QA/QC) procedures, data review, and data validation. These methods are designed to achieve the program objectives without introducing artifacts into the process from monitoring well cross-contamination or contamination from non-well sources. A summary of the sampling and analysis plan is summarized in Table 1.

5.5.1 Water Level and Well Depth Measurements

Prior to purging and sampling, depths to groundwater and to the bottom of monitoring well will be measured in each well. The depth to liquid in the primary sumps and secondary sumps will also be measured. The reference point for a monitoring well, piezometer, or sump is the marked location of the highest point of the riser. The elevations of the reference points on the risers and wet wells have been determined by a registered surveyor.

5.5.2 Water Level Measurements

Water levels measurements will be collected from piezometers, monitoring wells, and sumps on a biennial basis as proposed in this amendment. The depth to groundwater will be measured and recorded for the Site monitoring network (wells and piezometers) and sumps (primary and secondary sumps). Water levels at the Site will be measured, if possible, within a 24-hour period. Water level measurements will be made from the reference point on the top of the riser or top of the sump (primary sump wet wells or secondary sump riser pipe) to the static water level. Depth to water to the nearest one hundredth of a foot (0.01) will be determined using a wetted tape, mechanical sounding device, or electrical water level probe following the manufacturer's recommended procedure. The probe cable and tip will be rinsed with a soapy (Alconox) water wash and distilled water, as the equipment is withdrawn from each well. Care will be taken to minimize disturbance to the water column in the wells. Immiscible layers have not been reported at the Site to date. If encountered, the presence of immiscible layers will be identified and noted in the field notes.

Representative examples of maintenance and calibrations logs for the depth measurement instruments are presented in Appendix E. Water level data will be recorded with the well number, date, and time in the field logs.

5.5.3 Well Depth Measurements

On a biennial basis, the depth to the bottom of the well or piezometer will be measured for the Site monitoring network. The depth to the bottom of the well or piezometer will be measured after depth to water has been determined. Measurements will be made from the same reference point on the top of the riser that was used for the depth to water measurement. Depth to the bottom will be determined using weighted tape, or similar device, graduated to the nearest one-hundredth (0.01) of a foot. The equipment and cable will be cleaned with a soapy (Alconox) water wash and distilled water rinse, after the equipment is used at each well. Care will be taken to minimize disturbance to the water column of the wells.

Well depth measurements will be recorded with the well number, date, and time in the field logs.

5.5.4 Well Evacuations

After water level and well depth measurements have been completed, the wells will be purged of standing water within the well riser. The monitoring wells will be purged in order from least contaminated to most contaminated. In addition, the monitoring wells will be purged in an order that will allow for the collection of samples as soon as feasible following purging taking into consideration wells that may potentially be purged dry and require recharge.

Purging will be completed using a peristaltic pump with dedicated tubing. The tubing will be positioned in the well at the desired sample intake (the midpoint of the wetted interval of the screen). Replacement tubing will be installed if necessary, after depth to water and depth to the bottom of the well measurements have been taken. New replacement polyethylene tubing, if required, will be used at each well. Purging will be performed in a manner to minimize agitation of any sediment in the well.

Wells will be pumped to dryness or until a minimum of three well volumes to a maximum of five well volumes of groundwater are removed. A well volume (V) is defined by the equation:

$$V = HA$$

Where:
V = Well Volume;
H = Height of standing water in the riser (difference between the depth to groundwater and the depth to the bottom of the well); and
A = Horizontal, cross-sectional area of the well riser.

A generator, if used, will be placed so that the exhaust from the engine is downwind of the working area. The well will be pumped at a flow rate that should approximate the natural flow gradient, if possible, but at a maximum rate of 500 milliliters per minute (mL/min). The water level in the well will be monitored and the purge rate will be incrementally adjusted to maintain a drawdown of 0.3 foot or less to the extent possible. The purge rate will be reduced to the minimum capabilities of the pump to avoid pumping the well dry and/or to facilitate stabilization of parameters. Care will be taken not to cause pump suction to be broken. If the recharge rate of the well is very low, purging will be interrupted so as not to cause the drawdown within the well to advance below the pump intake. However, a steady flow rate will be maintained to the extent practicable. Purge rates will be recorded.

During well purging, field parameters (i.e., temperature, specific conductivity, turbidity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH) will be monitored at a minimum at the start of purging and after every well volume. Measurement of the field parameters will be taken using a clean container such as a plastic beaker or from a flow-through cell. The well is considered stabilized when three consecutive readings for each field parameter are within the following limits:

- Temperature ±0.5 degrees Celsius of the average value of the three readings
- Specific conductivity ±3% of the average value of the three readings
- Turbidity ≤ 10 NTUs or ± 10% if > 10 NTUs
- DO ±10% of the average value of the three readings
- ORP ±20 millivolts of the average value of the three readings
- pH ±0.2 pH units of the average value of the three readings.

An additional sample may be collected, filtered in the field using 0.45 µm filter, and analyzed for dissolved metals in addition to total metals, particularly if stabilized turbidity results for the monitoring well is greater than 10 Nephelometric Turbidity Units (NTUs). Both the total and dissolved analytical results will be evaluated.

No immiscible layers have been encountered at the Site; however, if any immiscible layers are identified, the layers will be sampled separately on a one-time basis. Any immiscible layers will be sampled prior to well evacuation using a disposable, bottom-loading bailer for light immiscible layers or a disposable, dual-check valve bailer for denser immiscible layers. Sampling of immiscible layers will be performed in a manner to minimize mixing of any immiscible layers. The volume of water purged from the well and other pertinent information (such as observation of a separated phase liquid, odor, color, relative turbidity, temperature, specific conductivity, turbidity, pH) will be recorded in the field log. The completed field log will be kept on file for review. Any potential problems in complying with the well evacuation procedures will be noted in the appropriate reports. Representative examples of the maintenance logs and field log forms are presented in Appendix C.

The purge water from the monitoring wells will be poured on the ground at least 30 feet away from the monitoring location after completion of sampling at the well. If the well is known to contain contaminants at levels exceeding primary MCLs, the purge water will be containerized and handled appropriately based on contaminant concentration.

5.5.5 Sample Collection

Each well will be sampled as soon as feasible after purging, depending on the rate of recharge to the well. Groundwater sample storage and preservation procedures are summarized in Table 2. Laboratory-supplied containers that have been pre-cleaned by the laboratory or supplier will be used. All sample containers will be filled directly from the sampling equipment (dedicated polyethylene tubing used with a peristaltic pump) to the sample containers. Care will be taken to minimize agitation and aeration during sample collection. The sample containers will be filled following standard SW-846 sampling protocols. Sample containers will be filled in the order of metals (barium, calcium, chromium, iron, magnesium, manganese, nickel, potassium, sodium) and inorganics (total cyanide, chloride, and sulfate). If applicable, samples for dissolved metals will be filtered using a new, disposable, 0.45-micron filter. Samples will be preserved with the appropriate preservative for the particular parameter.

Samples from the primary sumps and secondary sumps will be grab samples collected using a peristaltic pump and polyethylene tubing. Measurements of temperature, specific conductivity, turbidity, and pH from the same sample aliquot will be recorded after the samples are collected.

Quality assurance/quality control (QA/QC) samples will be included in each monitoring event, as specified in Section 5.6, and will be used to validate the analytical results. A minimum of one field duplicate sample will be included in the analysis along with the SW-846 standard laboratory blanks reported for each analytical run. The field duplicate will be prepared as a split sample of one of the monitoring wells and will be submitted blind to the laboratory to avoid laboratory bias of field QA/QC samples. The sample will be split by alternately filling the investigative and duplicate sample bottles for the same parameters from the pump tubing to ensure that the samples represent water from the same interval of the well. Each sample container will be labeled with the following information using a waterproof marker:

- Sample number (cross-referenced in the field log to the groundwater monitoring well location);
- Time and date of sampling;
- Initials of sampler;
- Analyses required (e.g., nickel, cyanide); and
- Type of preservative added.

This same information will be reported on the chain of custody record as detailed below. A representative example of the chain of custody record is presented in Appendix E.

5.5.6 Decontamination

Measuring equipment, including the pH meter, conductivity meter, turbidity meter, and temperature meter, that contacts the groundwater will be decontaminated using a soapy (Alconox) water wash and distilled water rinse between wells.

Dedicated tubing and new filters will be used at each well location, as required. The peristaltic pump will not come in direct contact with the groundwater and will not require decontamination.

5.5.7 Sample Preservation Chain of Custody and Shipment

Sample preservation is specific to the analysis performed, which are included in Table 2. The transport container provided by the laboratory will be used for storage of the collected samples and transportation of the samples to the analytical laboratory. The samples will be kept in the transport container, which will be cooled to approximately 4 °C from the time of sample collection to the time of delivery to the laboratory. The transport container will be packed with the samples, wet ice, and packing material to ensure that the appropriate sample temperature is maintained and that the sample containers are not broken in transit.

The appropriate chain of custody record will be signed and included in each of the transport containers, and the transport containers will be sealed with packing tape and custody seals. The transport containers will be delivered to the analytical laboratory by overnight courier service. Laboratory personnel will inspect the transport containers upon receipt and notify the project personnel of any difficulties with sample integrity, sample temperature, or holding time. Samples are tracked internally by the laboratory throughout all phases of analysis, with access restricted to authorized personnel. Completion of the field forms, sample key, and chain of custody forms will help to prevent misidentification of samples and to track the samples. A representative example of a chain of custody form is included in Appendix E.

5.6 ANALYTICAL QA/QC PROCEDURES

The selected analytical laboratory will perform all analyses in accordance with accepted industry methods. The samples will be analyzed using U.S. EPA-approved methods contained in U.S. EPA publication SW-846, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods,* Third Edition, November 1986 with promulgated updates. A complete list of parameters, U.S. EPA test method numbers, and quantitation limits are provided in Table 3.

5.6.1 Level of QA/QC Effort

To assess samples of data resulting from the field sampling program, field duplicate samples, field blank samples (equipment rinse), and matrix spike samples will be collected and submitted to the analytical laboratory. The QA/QC samples will be collected and assessed following Ohio EPA's Data Validation Plan Review Form Tier 1, Version 4.0, 19 February 2009.

Field duplicate samples will be collected at a frequency of one per ten or fewer investigative samples per parameter set, with a minimum of one field duplicate sample submitted per sampling event. For the inorganic analyses, one matrix spike and matrix spike duplicate (MS/MSD) will be analyzed at a minimum frequency of one per twenty or fewer investigative samples.

Field duplicate samples will be analyzed to check for sampling and analytical reproducibility. Field duplicate samples are to be used as a measure or precision throughout the sampling event. Comparison of field duplicate samples will be based upon the target analytes, both non-detected and detected, and the relative percent differences (RPD) of each analyte's concentration.

The sampling and analysis program is summarized in Table 1, which lists the specific parameters to be measured and the number and frequency of sampling. The level of QA effort required for each matrix is also summarized in this table. The QA/QC samples will be used to qualify the data in accordance with standard data validation procedures and not to correct the data.

5.6.2 Data Review and Validation

Upon receipt of the data packages from the project laboratory, the data will be reviewed and validated. The data review will evaluate the finished data sheets, field blank data, field duplicate data, and recover and RPD data for surrogate spikes, MS/MSD samples and MS/DUP samples. Validation of the data will consist of evaluating the QA/QC data based on the applicable review criteria specified in "U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," dated February 1994.

Assessment of analytical data will include checks for data consistency by looking for comparability of duplicate analysis, potential sample contamination as indicated by results of rinsate sample analyses, laboratory QA procedures, and adherence to accuracy and precision criteria, transmittal errors, and anomalously high or low parameter values. The results of these data validation will be presented in a data quality assessment and validation that is included with the data submittals.

5.6.3 Comparison to MCLs

Validated analytical results will be compared to the current MCL. If any of the validated analytical results exceed their respective MCL, confirmation samples will be collected from the location within 30 days of the determination of the initial exceedance. The Ohio EPA will be notified in writing of the potential exceedance of the MCL within 7 days of the initial sample or subsequent confirmation sample

exceedance. The notification will include a request to meet with representatives of the Northeast District Office of the Ohio EPA to discuss any additional actions, including confirmation sampling, if necessary.

6. Biennial Reporting

Post Closure and groundwater monitoring results will be submitted biennially before 1 March on the calendar year following groundwater sampling. The last biennial sampling event was conducted in 2020; therefore, the next report will be submitted no later than 1 March 2021. The reports will include the following information:

- Groundwater elevation figures for the Till Unit and Bedrock Unit with generalized flow direction arrows;
- Field sampling and inspection forms;
- Chain of custody documentation;
- Data validation memorandum;
- Determination of groundwater flow rate and direction in the Till and Bedrock Units;
- Evaluation of the monitoring program including well locations, parameters, and sampling frequency; and
- Summary of the monitoring results for the sampling period.

The report will be submitted no later than 1 March of the reporting year using the forms supplied by the Ohio EPA and the datafile formats specified by the Ohio EPA for the biennial reports.

Inspection records, field forms, and laboratory analytical reports will be maintained for 3 years from the date of the activity. Field logs and reports will be kept and maintained at the RACER Project Manager's office through the post-closure period. The Groundwater Monitoring Plan documentation will be available for inspection at reasonable times.

TABLES

TABLE 1
SAMPLING AND ANALYSIS PLAN
RACER ELYRIA
ELYRIA, OHIO

					QC Samples				
Task	**Sampling Locations**	**Field Parameters**	**Laboratory Parameters**	**Investigative Samples**	**Equipment Blank**	**Field Duplicate**	**MS[2]**	**MSD**	**Total Samples**
Groundwater Monitoring	P-02T, P-03T, P-03R, P-08T, P-12, P-12TR, P-14T, P-15T, P-16T, P-21T, P-02, P-08R, P-14, P-15, P-16, P-18, P-18T and P-21	Temperature, specific conductivity, turbidity, pH, water levels	Metals[1] (barium, calcium, chromium, iron, magnesium, manganese, nickel, potassium, and sodium), total cyanide, and chloride and sulfate	18	1	2	1	1	23
Water Levels	P-1, P-1T, P-11,P-13, P-13T, P-17, P-19, and P-20	Water levels	NA	--	-	--	--	--	--

Notes:
1. Metal analyses performed on unfiltered samples. Samples for dissolved metals may also be collected, field filtered, preserved, and analyzed.
2. Matrix spike/matrix spike duplicate (MS/MSD) are required for data validation.
Samples designated for MS/MSD analyses will be collected at a minimum frequency of one in twenty investigative samples or one per sample round.

TABLE 2
GROUNDWATER SAMPLE STORAGE AND PRESERVATION PROCEDURES
RACER ELYRIA
ELYRIA, OHIO

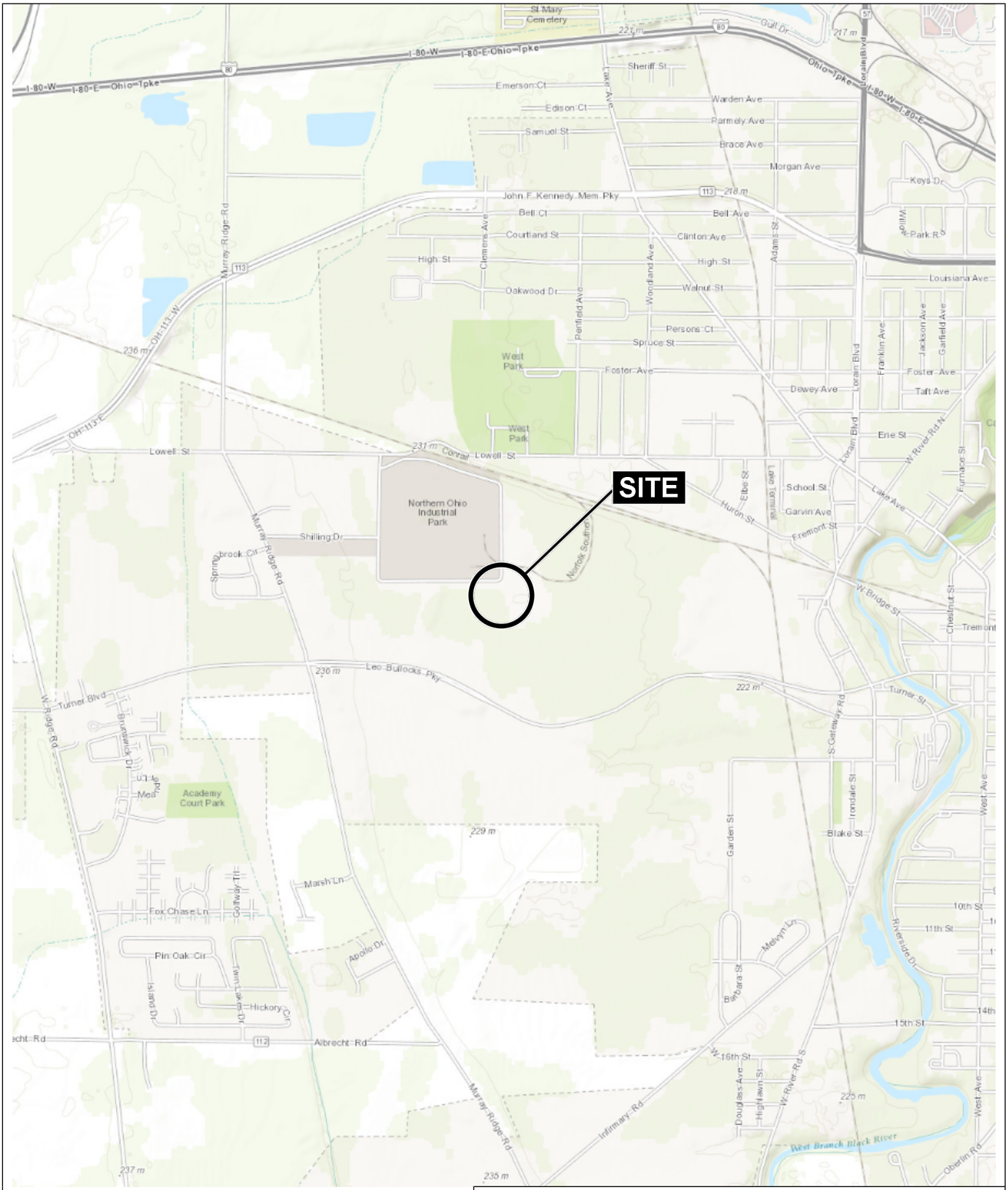
Analyses	Sample Containers	Preservation	Maximum Holding Time after Sample Collection	Sample Filling	Shipping	Packaging
Barium, calcium, chromium, iron, magnesium, manganese, nickel, potassium, and sodium	One 1-liter glass or plastic bottle	HNO_3 to pH <2, Iced, </= 4° C	180 days for analysis	Fill to neck of bottle	Overnight or hand deliver	Bubble Pack or Foam Chips
Total cyanide	One 500-mL plastic bottle	NaOH to pH >12, Iced, </= 4°C	14 days to analysis	Fill to neck of bottle	Overnight or hand deliver	Bubble Pack or Foam Chips
Chloride and sulfate	One 250-mL plastic bottle	Iced, </= 4°C	28 days for analysis	Fill to neck of bottle	Overnight or hand deliver	Bubble Pack or Foam Chips

TABLE 3
ANALYTICAL METHODS AND TARGETED QUANTITATION LIMITS FOR GROUNDWATER ANALYSES
RACER ELYRIA
ELYRIA, OHIO

Parameter	Parameters and Analytical Methods	Analytical Technique	Targeted Quantitation Limits (mg/L)
Barium	Metals by SW-846[1] Method 6010B	Inductively Coupled Plasma Spectroscopy	0.025
Calcium			5.0
Chromium			0.07
Iron			0.1
Magnesium			5.0
Manganese			0.015
Nickel			0.05
Potassium			5.0
Sodium			5.0
Total cyanide	EPA-WW 335.2	Spectrophorometric	0.040
Chloride	EPA-WW[2] 300.0	Ion Chromatography	1.0
Sulfate			5.0

Notes:
1. SW-846: "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846, Third Edition, November 1986 with promulgated updates.
2. EPA-WW: "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Revised March 1982 and subsequent revisions.
3. mg/L = milligrams per liter

FIGURES



MAP SOURCE: ESRI

SITE COORDINATES: 41°22'11"N, 82°8'8"W

HALEY ALDRICH

RACER TRUST LANDFILL
1400 LOWELL STREET
ELRYRIA, OHIO

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
JUNE 2015

FIGURE 1

41753-001_1_LOCUS.PDF

OHIO NORTHERN INDUSTRIAL PARK

P-01T
P-01

P-08T
P-08R
INACTIVE COLLECTION TANKS
P-21
P-21T
P-14T
P-14
P-16T
P-16
NW SECONDARY SUMP
NE SECONDARY SUMP
NW PRIMARY SUMP
NE PRIMARY SUMP
RCRA CLOSED LANDFILL
P-11 (HERRON)
P-12
P-12TR
P-20
P-02T
P-02
SW PRIMARY SUMP
SE PRIMARY SUMP
P-17
SW SECONDARY SUMP
SE SECONDARY SUMP
P-15T
P-15
P-18T
P-18
P-03T
P-03R
P-13T
P-13
P-19

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- BIENNIAL MONITORING WELLS
- PIEZOMETER FOR POST CLOSURE CARE WATER ELEVATION MONITORING
- PRIMARY SUMP
- SECONDARY SUMP
- SITE BOUNDARY

NOTES

1. AERIAL IMAGE PROVIDED AS PART OF ESRI BASEMAP WORLD IMAGERY.
2. ALL LOCATIONS AND ELEVATIONS BASED UPON A PRE-EXISTING SURVEY.

N

0 80 160 240 320
SCALE IN FEET

HALEY ALDRICH

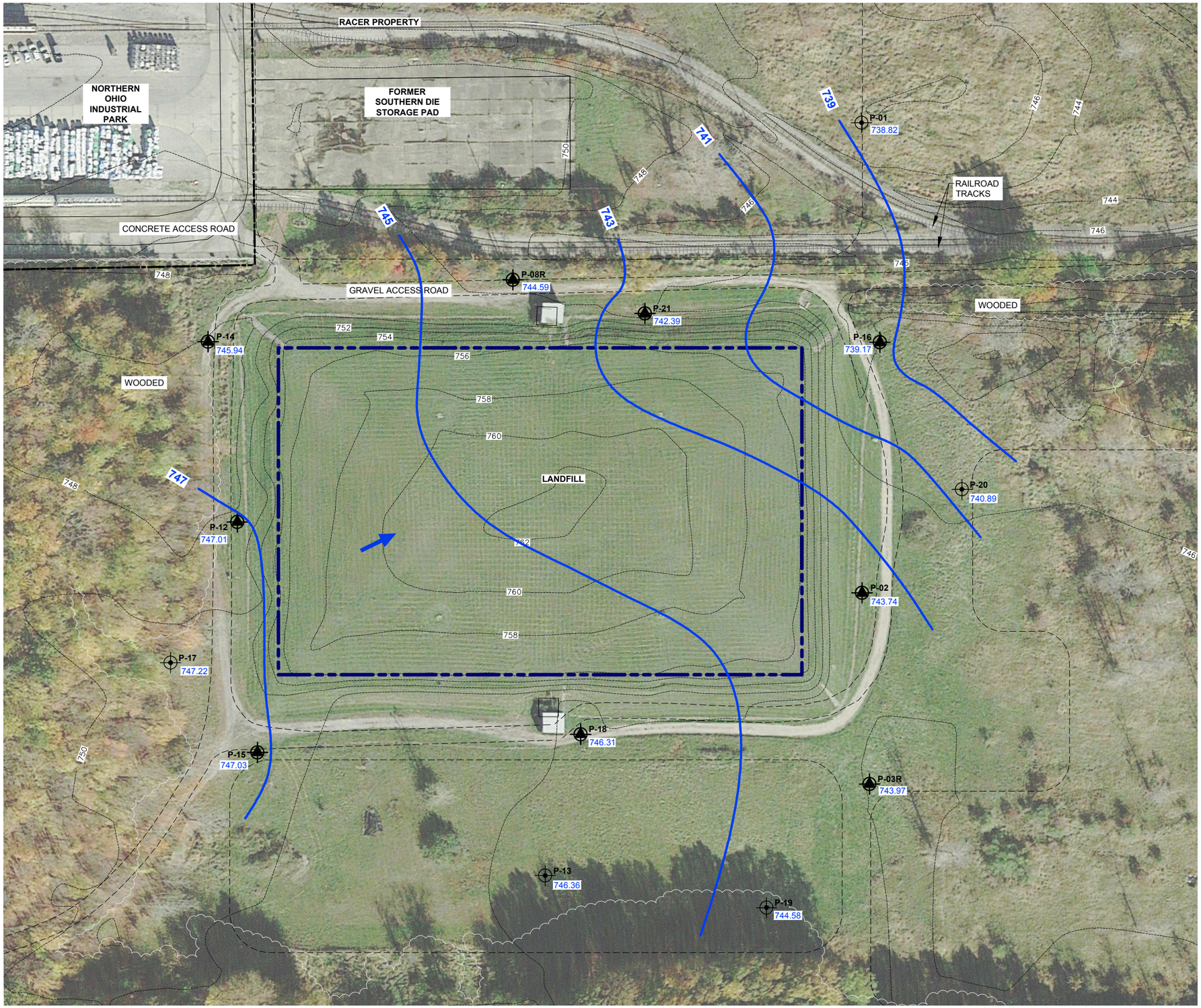
RACER ELYRIA
ELYRIA, OHIO

SITE LAYOUT MAP

DECEMBER 2015

FIGURE 2

GIS FILE PATH: G:\41753_RacerElyria\Global\GIS\RECOVERED 06.30.15\Groundwater Contours\41753-001-0002-SITE_MAP_d2.mxd — USER: dquatfiel — LAST SAVED: 12/2/2015 10:17:07 AM



LEGEND

- 750 — SURFACE CONTOUR/ELEVATION
- SITE BOUNDARY
- x — FENCE
- BIENNIAL MONITORING WELLS
- PIEZOMETER FOR POST CLOSURE CARE WATER ELEVATION MONITORING
- 738.82 — GROUNDWATER ELEVATION IN FEET
- 739 — INTERPRETED GROUNDWATER ELEVATION CONTOUR IN FEET, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION

NOTES

1. SURVEY PROVIDED BY CRA, DRAWING 12616-TO1 (PRES040GN-WA001), DATED FEBRUARY 26, 2015.
2. IMAGE FROM GOOFLE EARTH PRO, DATED OCTOBER 25, 2015.

N

0 100 200
SCALE IN FEET

HALEY ALDRICH

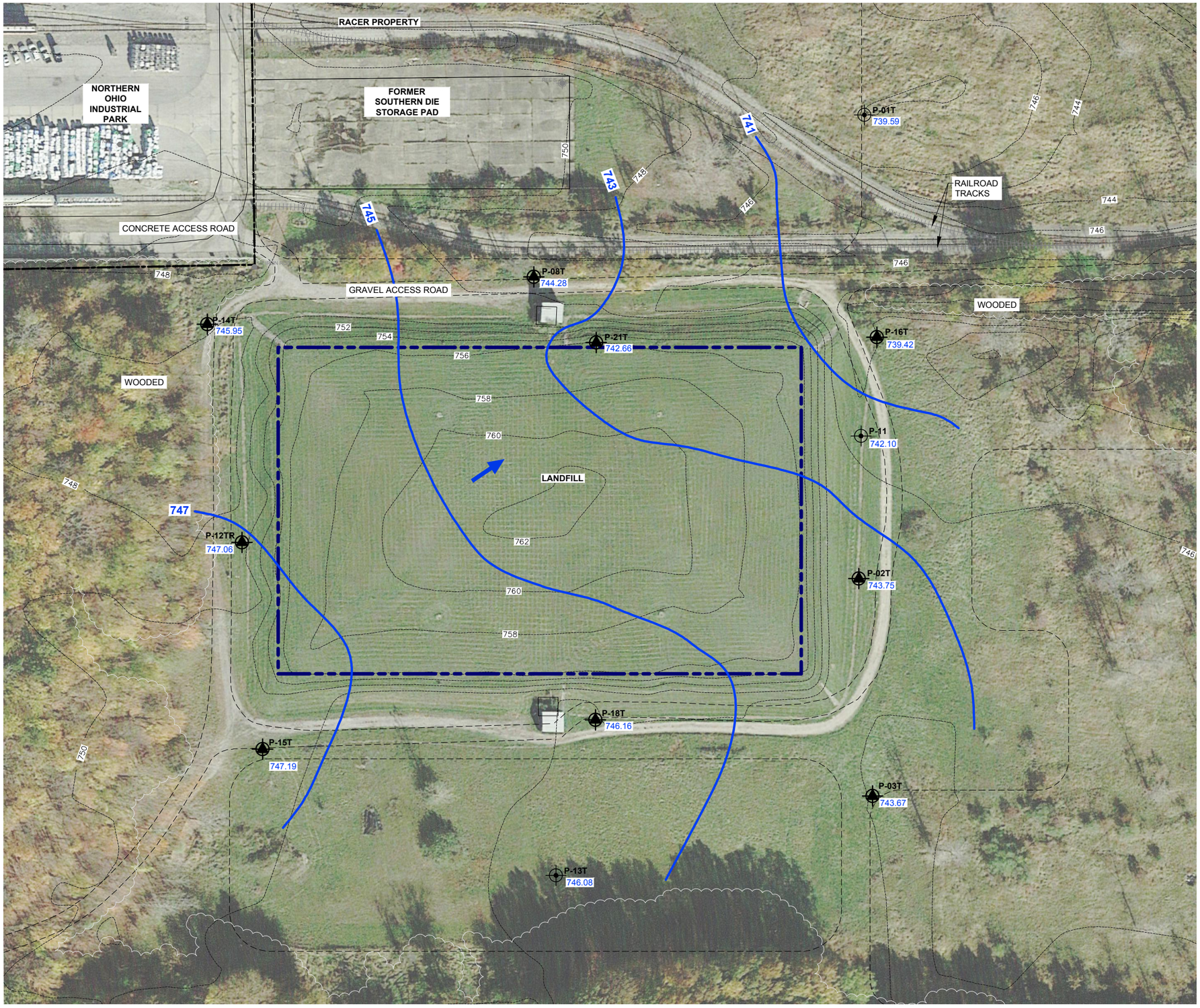
RACER TRUST ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

BEDROCK GROUNDWATER ELEVATIONS JUNE 2018

SCALE: AS SHOWN
JULY 2018

FIGURE 3

VARI, KATALIN Printed: 7/3/2018 11:30 AM Layout: JUNE 2018
G:\129862_RACER ELYRIA\CAD\FIGURES\129862-005_0003_GW 06-18 ROCK.DWG



LEGEND

- 750 — SURFACE CONTOUR/ELEVATION
- SITE BOUNDARY
- x — FENCE
- BIENNIAL MONITORING WELLS
- PIEZOMETER FOR POST CLOSURE CARE WATER ELEVATION MONITORING
- 739.59 — GROUNDWATER ELEVATION IN FEET
- 741 — INTERPRETED GROUNDWATER ELEVATION CONTOUR IN FEET, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION

NOTES

1. SURVEY PROVIDED BY CRA, DRAWING 12616-TO1 (PRES040GN-WA001), DATED FEBRUARY 26, 2015.
2. IMAGE FROM GOOFLE EARTH PRO, DATED OCTOBER 25, 2015.

N

0 100 200
SCALE IN FEET

HALEY ALDRICH

RACER TRUST ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

TILL CONTACT GROUNDWATER ELEVATIONS JUNE 2018

SCALE: AS SHOWN
JULY 2018

FIGURE 4

VARI, KATALIN Printed: 7/3/2018 11:28 AM Layout: JUNE 2018
G:\129862_RACER ELYRIA\CAD\FIGURES\129862-005_0002_GW 06-18 TILL.DWG

APPENDIX A

Inspection Form

Semi-Monthly Inspection Form

Inspector Name:_____
Company:_____
Date:_____

ALL FAILURES ARE TO BE ADDRESSED WITH PROPER NOTIFICATION OF AUTHORITIES AND CORRECTIVE ACTION.

LANDFILL INSPECTION GUIDE CLOSED LANDFILL ELYRIA, OHIO

CAP & BERM

Inspect for deep root penetration, burrowing animals, soil erosion and slope failures.
Inspect the landfill cap and berm for water ponding and washouts.
OBSERVATION_____
_____
CORRECTIVE ACTION _____
_____Date_____

VEGETATION

Inspect for proper vegetation height (max. 6") and solid growth.
OBSERVATION_____
_____
CORRECTIVE ACTION_____
_____Date_____

ACCESS ROADS

Inspect for sufficient gravel and proper drainage.
OBSERVATION_____
_____ CORRECTIVE
ACTION_____
_____Date_____

MONITORING WELLS

Inspect for secure guard casings, locking caps, proper vegetation height around well (4' radius), corrosion of guard casing, visible ID number.
OBSERVATION_____
_____ CORRECTIVE
ACTION_____
_____Date_____

SITE PRIMARY FENCE

Inspect all perimeter fencing and gates for damage or unauthorized entry and proper warning signs.
OBSERVATION_____
_____ CORRECTION
ACTION_____
_____

SURVEY BENCHMARKS

Inspect for signs of disturbance.
OBSERVATION_____
_____
CORRECTIVE ACTION_____
_____Date_____

PRIMARY SUMP

Measure liquid level in each primary sump:

Sump	Depth to Water	Action Level*	90% of Action Level**
NW Primary Sump	_____ ft	13.2 ft	12.8 ft
NE Primary Sump	_____ ft	13.4 ft	12.9 ft
SW Primary Sump	_____ ft	13.7 ft	13.4 ft
SE Primary Sump	_____ ft	12.4 ft	12.0 ft

*Remove leachate within 48 hours if depth to water equal to or greater than action level.

**Schedule leachate removal when depth to water reaches 90% of action level.

CORRECTIVE ACTION_____
_____Date_____

APPENDIX B

Landfill Evaluation Memorandum

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

4 September 2020
File No. 129862-008

TO: Ohio EPA
Sylvia Chinn-Levy

C: RACER Trust
Pam Barnett

FROM: Haley & Aldrich, Inc.
Ban Aragona *BNA*
Brian Lowes, P.E. BL

SUBJECT: RACER Elyria Landfill Evaluation

Haley & Aldrich, Inc. is pleased to present this technical memorandum to Revitalizing Auto Communities Environmental Response Trust (RACER) that reviews the potential interaction between water within the landfill and surrounding groundwater at the Elyria Landfill (Site). The work is being conducted pursuant to an observed increase in leachate extraction volumes.

Landfill leachate is extracted from the landfill on a monthly basis in general accordance with the Post Closure Care (PCC) Plan[1]. The PCC plan requires a minimum of primary sumps extraction once per month despite sump level elevations consistently observed less than action levels, which are also defined within the plan. The PCC Plan also requires secondary sumps extraction if water is observed.

An increase in leachate extraction volumes was observed during Q1 2019 which initiated review of observations and data associated with the landfill. The preliminary review indicated that the landfill's upper drainage layer has not been inspected nor cleaned since installation. In addition, groundwater elevations collected during the 2018 groundwater monitoring event were similar in elevation to the static water elevations within the landfill's primary sumps.

As a result of the observations, an evaluation of the landfill was conducted. This evaluation includes upper drainage layer observations and cleaning, a transducer study, and collection of leachate water samples for analysis, as detailed further below.

UPPER DRAINAGE LAYER EVALUATION

Camera observations and jetting of the upper drainage layer piping was completed by Bloodhound Underground Utility Locators (Bloodhound) on 31 October 2019. Debris and obstructions were observed in drainage pipe including rocks, animals, and nests. These obstructions were removed to the extent possible and pipes were left clear for drainage. The live animals were left undisturbed. As precipitation persisted throughout the day (<1 inch per 24 hours), water was observed to be flowing through the backfill of the pipes, indicating that some drainage has continued to occur over previous years. A summary of the inspection, including photos, is included in Bloodhound's report as Attachment A.

Based on the observations, the upper drainage layer appears to be in good condition and operating as intended since retrofitted drainage tile installation[2]. Animal guards were installed at the end of each drainage pipe to prevent animal habitation in the drainage layer. Haley & Aldrich does not currently recommend additional repairs.

LANDFILL/GROUNDWATER INTERACTION EVALUATION

To evaluate the current conditions of the landfill and its potential interaction with groundwater, a transducer study was completed which monitored the fluctuations in groundwater elevations compared to liquid elevations within the landfill sumps. Annotated Charts illustrating well and sump transducer data are included as Attachment B.

Observations based on data provided in the charts include:

- Following each extraction event, the immediate recharge within individual sumps rebounds to within several inches of the pre-extraction water elevation. This is indicative of rapid recharge from the lower drainage layer but an overall reduction of water level within the drainage layer.
- The month following each extraction event show a linear and gradual rebound to elevation inches below the previous month's elevation. This gradual rebound is indicative of water entering the landfill cap and slowly percolating through the landfill.
- In general, there was an overall decline in water elevation within sumps despite moderate precipitation events and a general increase in groundwater elevations surrounding the landfill.
- Groundwater elevations rose following precipitation events; however, sump levels did not react in the same manner. This further indicates no significant damage to the upper cap is evident.
- Throughout the observation period, the water levels within the wells at the Site increased by up to four feet; however, the water levels in the primary sumps either remained the same or decreased slightly. Even with groundwater elevation fluctuation during the monitoring period, sump elevations remained steady with a gradual increase between extraction events as expected.
- Early in the observation period, groundwater elevations were less than the sump elevations. Measurable leakage from the sumps to the groundwater was not observed. This inverse

relationship further indicates a lack of connection between the landfill and the surrounding groundwater elevations.

- Direct interaction between groundwater and the landfill sumps do not appear to be evident.

Based on the observations during this study, the landfill sumps do not appear to interact with the groundwater to a measurable extent. Manual measurements of water levels will continue to further confirm these findings over time.

CONCLUSION AND RECOMMENDED NEXT STEPS

Based on current evaluation data, there does not appear to be a significant issue with the drainage pipes within the upper drainage layer. However, this drainage layer was a retrofit to the existing landfill and may not be optimal for slopes, drainage mat sizing, etc. Stormwater that accumulates at low spots within the drainage mat will still eventually percolate through the landfill very slowly over time, consistent with landfill models. Based on the hydrographs, the gradual recharge of sumps following rain events do not indicate a direct channel or conduit connection from the surface to the sumps.

Connection to the groundwater is not evident based on the elevations of groundwater and leachate within the sumps observed during the time of study. During the study, water elevations in the sumps did not increase along with the groundwater network indicating that there is not a connection between the groundwater and landfill leachate sumps. Following monthly extractions from the sumps, water elevations slowly rise (as observed in Attachment B), but this is typical as water percolates through the landfill waste and is collected in the leachate collection system. This is consistent with previous landfill modeling efforts.

Based on the good condition of the upper drainage layer and cap and the lack of evidence for connection between groundwater and the leachate sumps, the following operational changes are recommended:

- Revise the PCC Plan to include the following:
  - Reduce the frequency of extraction events required per year. Currently the plan indicates a minimum of one extraction event per month. The plan can be modified to be action level based with an updated minimum extraction requirement (i.e., quarterly or 2x per year);
  - Remove the requirement for extraction of secondary sumps when water is present. An evaluation conducted in 2003[3] indicated that connectivity between the secondary and primary sumps is evident. Therefore, it is unlikely that the secondary sumps will be void of leachate. Based on the data provided in this study, the liner effectively protects groundwater from directly interacting with landfill leachate; and
  - A trial period approach should be considered to include a limited pumping frequency over a 2-3 years duration prior to revising the PCC Plan.

- Re-evaluate discharge and offsite treatment options based on recent leachate analytical data and anticipated quantities per leachate event.
- To prevent animals from entering the upper drainage layer piping, grated animal guards have been recommended and are installed at each drainage pipe location. A variety was selected such that animals that dwelled in the pipes can leave but will be unable to re-enter.

Attachments
Attachment A – Upper Drainage Layer Inspection and Cleaning Report
Attachment B – Annotated Transducer Study Charts

Works Cited
[1] Haley & Aldrich, Inc. Amendment to: Post-Closure Plan for RACER Elyria. Cleveland, Ohio, 2015.
[2] Construction Documentation Report Post Closure Maintenance Activities, Elyria, Ohio: Conestoga-Rovers & Associates, 2011.
[3] REALM, INC. Primary and Secondary Sump Pumping Test Report. Elyria, Ohio: Conestoga-Rovers & Associates, 2003.

ATTACHMENT A

Upper Drainage Layer Inspection and Cleaning Report

Project

Project	157069 - Haley & Aldrich - Northern Ohio Industrial Park
Start Date	10/31/2019
End Date	10/31/2019

Blood Hound
750 Patricks Place, Brownsburg, IN 46112
Tel. (888) 858-9830
bhi@bhug.com

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157069 - Haley & Aldrich - Northern Ohio Industrial Park		**10/31/2019**

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Blood Hound
750 Patricks Place, Brownsburg, IN 46112
Tel. (888) 858-9830
bhi@bhug.com

Project Information

Project	
157069 - Haley & Aldrich - Northern Ohio Industrial Park	**10/31/2019**

Contractor

Company:	Blood Hound
Responsible person:	
Division:	
Street:	750 Patricks Place
City:	Brownsburg, IN 46112
Phone:	(888) 858-9830
Fax:	
Mobile:	
E-Mail:	bhi@bhug.com

Blood Hound
750 Patricks Place, Brownsburg, IN 46112
Tel. (888) 858-9830
bhi@bhug.com

Section Profile

Project	
157069 - Haley & Aldrich - Northern Ohio Industrial Park	**10/31/2019**

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
6	Northeast South	West	10/31/2019	1400 Lowell St.		Polyethylene	341.26	341.26
8	South	North Central	10/31/2019	1400 Lowell St.		Polyethylene	15.74	15.74
9	South	Northwest South	10/31/2019	1400 Lowell St.		Polyethylene	327.74	327.74

3 x Circular 8 = 1925.72 Total Length (1924.95 Length Surveyed)

Total: 3 = 1925.72 Total Length (684.74 Length Surveyed)

Blood Hound
750 Patricks Place, Brownsburg, IN 46112
Tel. (888) 858-9830
bhi@bhug.com

Section Summary

Project	
157069 - Haley & Aldrich - Northern Ohio Industrial Park	**10/31/2019**

Number of sections	10
Total length of sewer network	1925.72 ft
Inspected length of sewer network	1924.95 ft
Not inspected length of sewer network	0.77 ft
Total abandoned inspections	7
Number of section inspection photos	56
Number of section inspection videos	10
Number of section inspection scans	0
Number of section inclination measurements	0

Pipe Segment Reference	**South-North Central**	Upstream MH	**South**
City	**Elyria, OH**	Downstream MH	**North Central**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**12.0**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	6.23	DSC	Deposits Settled Compacted, 15% of cross sectional area from 5 o'clock to 7 o'clock
4	11.55	DSC	Deposits Settled Compacted, 35% of cross sectional area from 3 o'clock to 6 o'clock
5	11.56	MSA	Survey Abandoned

Pipe Segment Reference	**West-Northeast North**	Upstream MH	**West**
City	**Elyria, OH**	Downstream MH	**Northeast North**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**65.0**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	12.70	D	Deformed, 20% changed
4	64.67	MSA	Survey Abandoned

Pipe Segment Reference	**South-Northeast South**	Upstream MH	**South**
City	**Elyria, OH**	Downstream MH	**Northeast South**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**3.7**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point

Blood Hound
750 Patricks Place, Brownsburg, IN 46112
Tel. (888) 858-9830
bhi@bhug.com

Section Summary

Project	
157069 - Haley & Aldrich - Northern Ohio Industrial Park	**10/31/2019**

	Distance	PACP Code	Observation
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	3.72	MSA	Survey Abandoned

Pipe Segment Reference	**North-Southeast North**	Upstream MH	**North**
City	**Elyria, OH**	Downstream MH	**Southeast North**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**4.7**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	4.69	MSA	Survey Abandoned

Pipe Segment Reference	**West-Southeast South**	Upstream MH	**West**
City	**Elyria, OH**	Downstream MH	**Southeast South**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**5.9**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	2.93	DSGV	Deposits Settled Gravel, 20% of cross sectional area from 5 o'clock to 7 o'clock
4	5.94	MSA	Survey Abandoned

Pipe Segment Reference	**Northeast South-West**	Upstream MH	**Northeast South**
City	**Elyria, OH**	Downstream MH	**West**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**341.3**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	14.66	D	Deformed, 10% changed
4	27.06	MWLS	Water Level, Sag in pipe, 10% of the vertical dimension, Start
5	33.35	MWLS	Water Level, Sag in pipe, 10% of the vertical dimension, Finish
6	52.12	D	Deformed, 20% changed
7	52.81	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension
8	65.62	D	Deformed, 10% changed
9	85.39	D	Deformed, 25% changed
10	91.20	D	Deformed, 10% changed
11	106.55	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension, Start
12	118.44	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension, Finish
13	121.59	MGO	General Observation
14	168.33	MWLS	Water Level, Sag in pipe, 10% of the vertical dimension
15	180.39	D	Deformed, 10% changed
16	194.99	D	Deformed, 10% changed
17	273.19	D	Deformed, 15% changed
18	341.26	ADP	Discharge Point

Pipe Segment Reference	**West-Southeast South**	Upstream MH	**West**
City	**Elyria, OH**	Downstream MH	**Southeast South**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**783.6**	Material	**Polyethylene**

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Section Summary

Project	
157069 - Haley & Aldrich - Northern Ohio Industrial Park	**10/31/2019**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	74.56	D	Deformed, 15% changed
4	138.07	D	Deformed, 5% changed
5	170.53	D	Deformed, 5% changed
6	247.95	TF	Tap Factory Made at 9 o'clock, 8inch dim
7	272.39	D	Deformed, 10% changed
8	296.46	RFJ	Roots Fine Joint at 1 o'clock, within 8 inch
9	297.25	RFJ	Roots Fine Joint at 1 o'clock, within 8 inch
10	312.36	D	Deformed, 15% changed
11	380.85	D	Deformed, 15% changed
12	783.62	MSA	Survey Abandoned

Pipe Segment Reference	**South-North Central**	Upstream MH	**South**
City	**Elyria, OH**	Downstream MH	**North Central**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**15.7**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	15.74	ATC	Tee Connection at 12 o'clock, 8"inch vertical, 8"inch horizontal

Pipe Segment Reference	**South-Northwest South**	Upstream MH	**South**
City	**Elyria, OH**	Downstream MH	**Northwest South**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**327.7**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	327.74	AEP	End of Pipe

Pipe Segment Reference	**West-Northwest North**	Upstream MH	**West**
City	**Elyria, OH**	Downstream MH	**Northwest North**
Street	**1400 Lowell St.**	Shape	**Circular 8inch**
Total Length	**366.0**	Material	**Polyethylene**

	Distance	PACP Code	Observation
1	0.00	ADP	Discharge Point
2	0.00	MWL	Water Level, 5% of the vertical dimension
3	43.33	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension
4	113.43	D	Deformed, 5% changed
5	168.61	MWLS	Water Level, Sag in pipe, 15% of the vertical dimension
6	190.61	MWLS	Water Level, Sag in pipe, 15% of the vertical dimension
7	215.54	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension
8	231.37	DSC	Deposits Settled Compacted, 30% of cross sectional area from 5 o'clock to 7 o'clock
9	283.05	TF	Tap Factory Made at 9 o'clock, 8inch dim
10	366.01	MSA	Survey Abandoned

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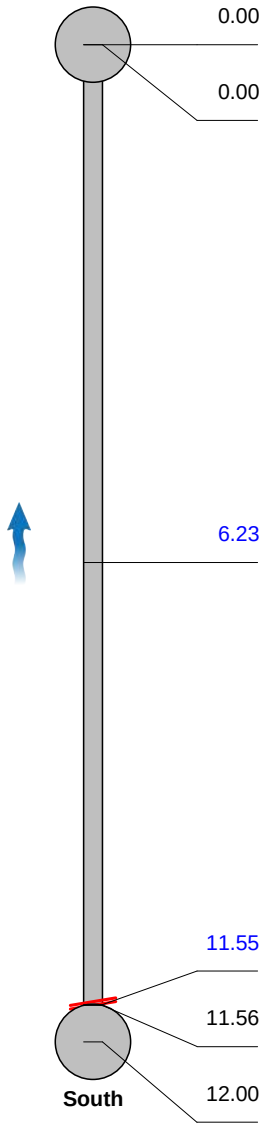
Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**South-North Central**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**12.0 '**	**11.6 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**South**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**North Central**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:91	Distance	Code	Observation	Counter	Photo	Grade
	0.00	ADP	Discharge Point / North Central discharge heading South.	00:00:00		
	0.00	MWL	Water Level, 5% of the vertical dimension	00:00:07		
	6.23	DSC	Deposits Settled Compacted, 15% of cross sectional area from 5 o'clock to 7 o'clock	00:01:02		M3
	11.55	DSC	Deposits Settled Compacted, 35% of cross sectional area from 3 o'clock to 6 o'clock / Large rock.	00:02:07		M5
	11.56	MSA	Survey Abandoned / Can not pass rocks in pipe.	00:02:32		
	12.00		End of pipe			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5131	0.0	8.0	8.0	0.0	4.0	4.0

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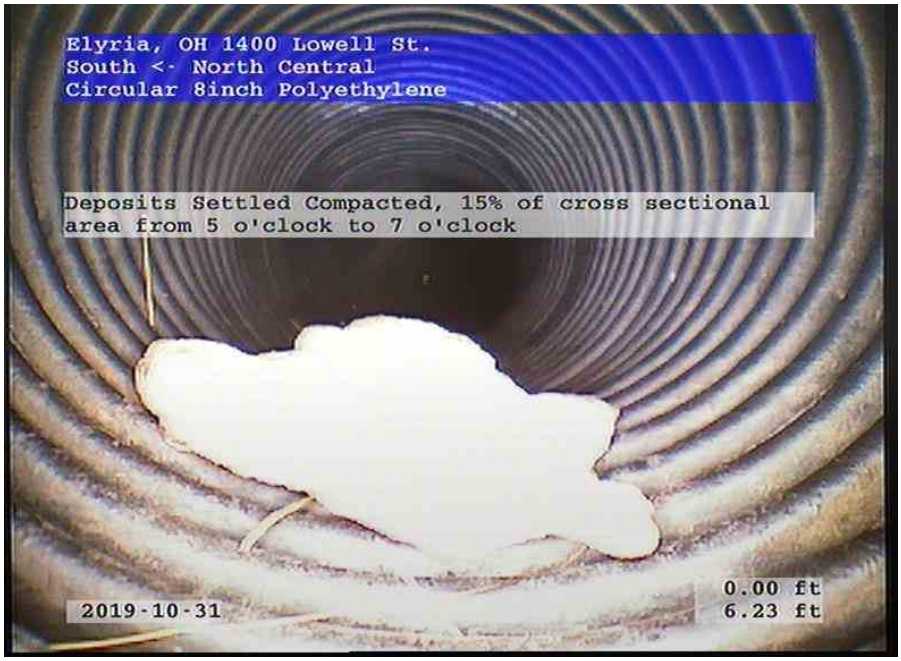
Section Pictures - 10/31/2019 - South-North Central

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**South-North Central**	**1**

South-North Central_c99a7571-8043-4589-9d6e-2ca9758d3c5a_20191031_084252_495.jpg, 00:00:00, 0.00ft
Discharge Point



South-North Central_f308c9af-d8ca-474b-aba3-ebc824385c99_20191031_084411_735.jpg, 00:01:02, 6.23ft
Deposits Settled Compacted, 15% of cross sectional area from 5 o'clock to 7 o'clock

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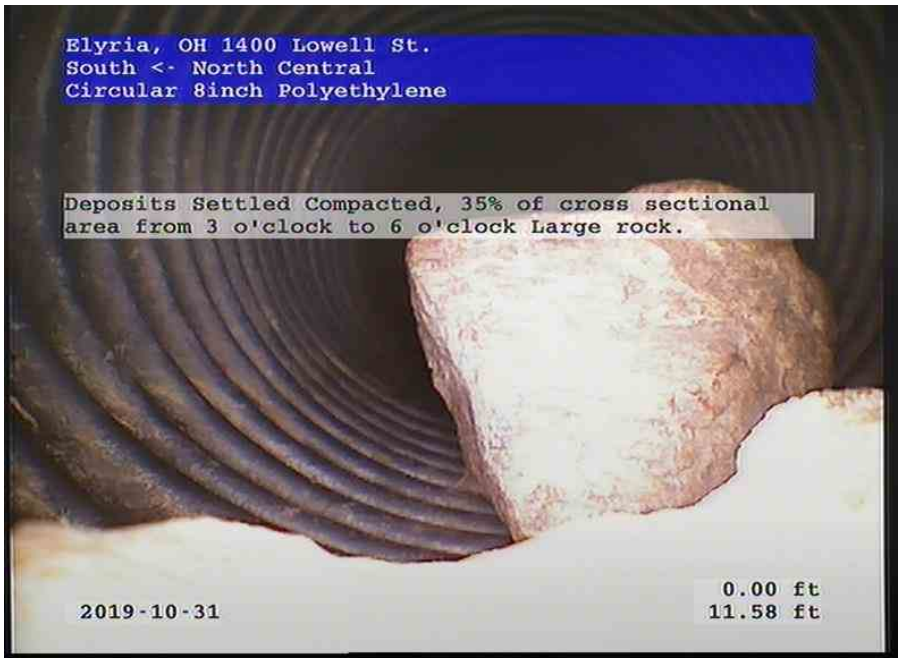
Section Pictures - 10/31/2019 - South-North Central

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**South-North Central**	**1**



South-North Central_b4e06e87-dd69-474f-a0c0-e46d20e5f38d_20191031_084540_895.jpg, 00:02:07, 11.55ft
Deposits Settled Compacted, 35% of cross sectional area from 3 o'clock to 6 o'clock

South-North Central_f0f16c76-02e4-473b-9105-7029c37c4d01_20191031_084656_395.jpg, 00:02:32, 11.56ft
Survey Abandoned

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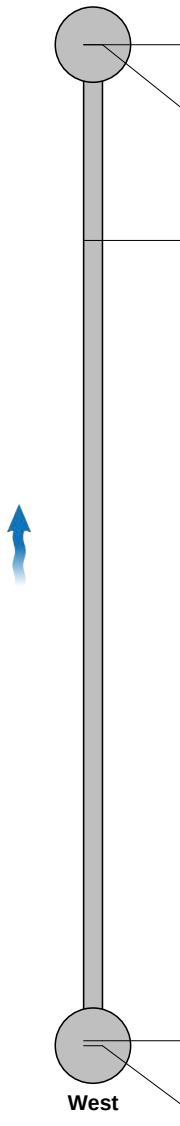
Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**West-Northeast North**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**65.0 '**	**64.7 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**West**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Northeast North**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:491 Distance	Code	Observation	Counter	Photo	Grade
0.00	ADP	Discharge Point / Northeast North	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:08		
12.70	D	Deformed, 20% changed	00:01:01		S5
64.67	MSA	Survey Abandoned / Can not pass racoon.	00:07:00		
65.00		End of pipe			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5100	0000	5.0	0.0	5.0	5.0	0.0	5.0

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Section Pictures - 10/31/2019 - West-Northeast North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northeast North**	**2**

West-Northeast North_d0968b40-9ab4-4928-a4b0-4167495754e9_20191031_092840_070.jpg, 00:00:00, 0.00ft
Discharge Point

West-Northeast North_ea25ff16-b098-4eea-8c57-f587963d3b40_20191031_093015_990.jpg, 00:01:01, 12.70ft
Deformed, 20% changed

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Section Pictures - 10/31/2019 - West-Northeast North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northeast North**	**2**

West-Northeast North_019c96a4-564a-49cf-ab16-098a7b071397_20191031_093956_600.jpg, 00:07:00, 64.67ft
Survey Abandoned

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**South-Northeast South**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**3.7 '**	**3.7 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**South**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Northeast South**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:50 Distance	Code	Observation	Counter	Photo	Grade
0.00	ADP	Discharge Point / Northeast South	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:12		
3.72	MSA	Survey Abandoned / Can not pass rocks.	00:00:54		
3.72		End of pipe			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

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Section Pictures - 10/31/2019 - South-Northeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**South-Northeast South**	**3**

South-Northeast
South_406ce8ba-2203-49f8-8e1b-991e7a9781ac_20191031_095500_247.jpg, 00:00:00, 0.00ft
Discharge Point

South-Northeast
South_de225c83-cf7a-408c-8adc-360815883731_20191031_102206_004.jpg, 00:00:54, 3.72ft
Survey Abandoned

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**North-Southeast North**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**4.7 '**	**4.7 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**North**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Southeast North**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:50 Distance	Code	Observation	Counter	Photo	Grade
0.00	ADP	Discharge Point / Southeast North	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:07		
4.69	MSA	Survey Abandoned / Can not pass rocks in pipe.	00:00:36		
4.69		End of pipe			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

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Section Pictures - 10/31/2019 - North-Southeast North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**North-Southeast North**	**4**

North-Southeast North_a4fb8c06-b238-4cfe-aa60-2f0a0399c305_20191031_105636_789.jpg, 00:00:00, 0.00ft
Discharge Point

North-Southeast North_737c3bbf-e285-464a-86a9-b0f90fc366b9_20191031_105730_215.jpg, 00:00:36, 4.69ft
Survey Abandoned

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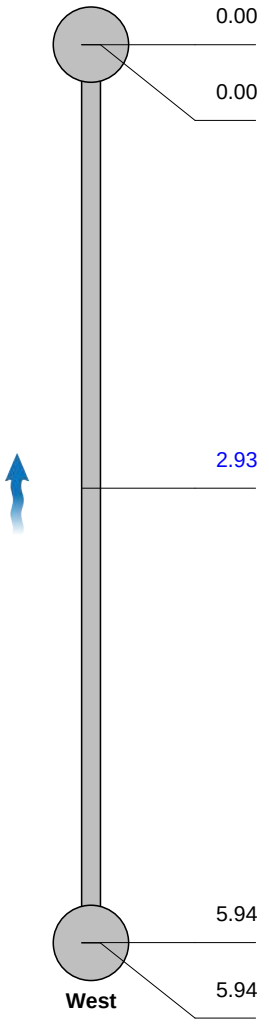
Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**West-Southeast South**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**5.9 '**	**5.9 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**West**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Southeast South**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:50 Distance	Code	Observation	Counter	Photo	Grade
0.00	ADP	Discharge Point / Southeast South	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:13		
2.93	DSGV	Deposits Settled Gravel, 20% of cross sectional area from 5 o'clock to 7 o'clock	00:00:31		M3
5.94	MSA	Survey Abandoned / Can not pass rocks.	00:01:27		
5.94		End of pipe			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	0.0	3.0	3.0	0.0	3.0	3.0

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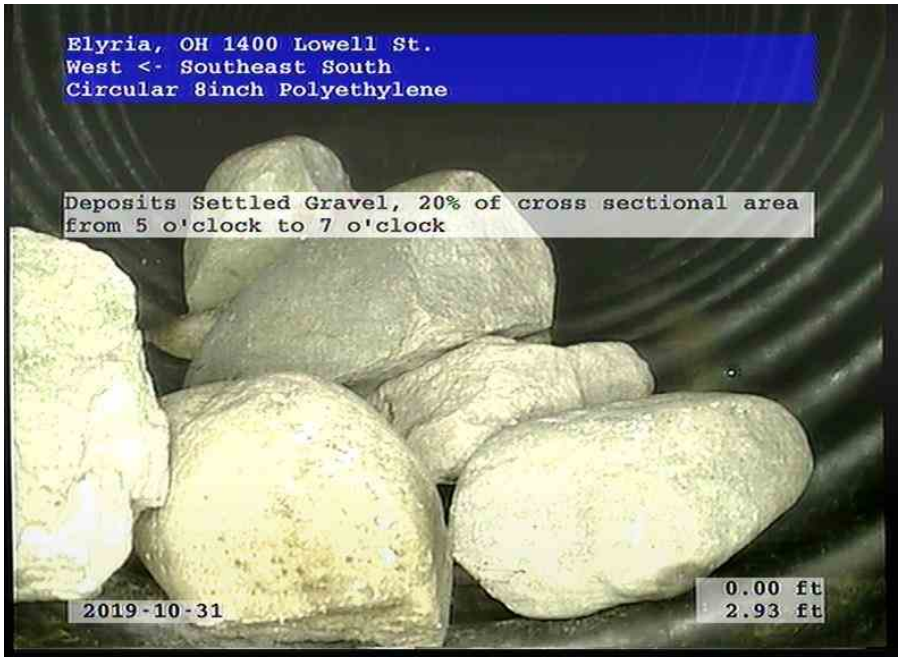
Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**5**

West-Southeast South_48dce329-3f1d-46e8-8c1b-5b46760ac551_20191031_105906_665.jpg, 00:00:00, 0.00ft
Discharge Point



West-Southeast South_b7f531f0-1a3f-464e-b715-54dadc8e5b8b_20191031_105956_768.jpg, 00:00:31, 2.93ft
Deposits Settled Gravel, 20% of cross sectional area from 5 o'clock to 7 o'clock

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**5**

West-Southeast South_a2626f22-b425-43cb-aa93-49e1a4e88ae2_20191031_110102_020.jpg, 00:01:27, 5.94ft
Survey Abandoned

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**Northeast South-West**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**341.3 '**	**341.3 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**Northeast South**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**West**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:	**After Jetting**				

1:1767 Distance		Code	Observation	Counter	Photo	Grade
0.00		ADP	Discharge Point / Northeast South after jetting.	00:00:00		
0.00		MWL	Water Level, 5% of the vertical dimension	00:00:07		
14.66		D	Deformed, 10% changed	00:01:02		S4
27.06	S01	MWLS	Water Level, Sag in pipe, 10% of the vertical dimension, Start	00:01:53		
33.35	F01	MWLS	Water Level, Sag in pipe, 10% of the vertical dimension, Finish	00:02:10		S2
52.12		D	Deformed, 20% changed	00:02:49		S5
52.81		MWLS	Water Level, Sag in pipe, 5% of the vertical dimension	00:04:59		S2
65.62		D	Deformed, 10% changed	00:05:25		S4
85.39		D	Deformed, 25% changed	00:06:19		S5
91.20		D	Deformed, 10% changed	00:06:41		S4
106.55	S02	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension, Start	00:07:38		
118.44	F02	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension, Finish	00:08:12		S2
121.59		MGO	General Observation / Seam appears to be seperating.	00:09:26		
168.33		MWLS	Water Level, Sag in pipe, 10% of the vertical dimension	00:11:19		S2
180.39		D	Deformed, 10% changed	00:11:41		S4
194.99		D	Deformed, 10% changed	00:12:18		S4

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bhi@bhug.com

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**Northeast South-West**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**341.3 '**	**341.3 '**

Northeast South

1:1767 Distance	Code	Observation	Counter	Photo	Grade
273.19	D	Deformed, 15% changed	00:15:13		S5
341.26	ADP	Discharge Point / Southeast North	00:17:24		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5345	0000	45.0	0.0	45.0	3.5	0.0	3.5

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast South-West_7ff63e6d-4ada-4def-a0c8-998b8147ff0e_20191031_112836_015.jpg, 00:00:00, 0.00ft
Discharge Point

Northeast South-West_6fe19efa-8ec1-4be9-aece-1d6a736e9005_20191031_112953_725.jpg, 00:01:02, 14.66ft
Deformed, 10% changed

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast
South-West_e304673e-9e59-473b-b8bb-c309b0a34e4b_20191031_113052_767.jpg,
00:01:53, 27.06ft
Water Level, Sag in pipe, 10% of the vertical dimension, Start

Northeast South-West_2e4c4a35-28a4-4f6f-bd51-1c9a6e7f14ea_20191031_113112_308.jpg,
00:02:10, 33.35ft
Water Level, Sag in pipe, 10% of the vertical dimension, Finish

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast
South-West_422ca95e-543a-4013-95e4-56cdb3db73fe_20191031_113158_561.jpg,
00:02:49, 52.12ft
Deformed, 20% changed

Northeast South-West_bdfccd14-7ccc-4f71-950a-f52a4c11683f_20191031_113611_977.jpg,
00:04:59, 52.81ft
Water Level, Sag in pipe, 5% of the vertical dimension

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast South-West_aa356f1d-fcf7-4984-8772-1995aa87e02d_20191031_113643_578.jpg, 00:05:25, 65.62ft
Deformed, 10% changed

Northeast South-West_2db5c6e7-97ec-4ee7-af13-d6e21f47bca3_20191031_113749_102.jpg, 00:06:19, 85.39ft
Deformed, 25% changed

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast
South-West_dd7d2c25-056c-4399-8c91-92227aa3ac84_20191031_113817_524.jpg,
00:06:41, 91.20ft
Deformed, 10% changed

Northeast
South-West_6662647e-2b0b-47cf-8650-8081eee5573a_20191031_113920_905.jpg,
00:07:38, 106.55ft
Water Level, Sag in pipe, 5% of the vertical dimension, Start

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast
South-West_509edd4d-809f-4033-9c34-7d29da566b2a_20191031_113959_803.jpg,
00:08:12, 118.44ft
Water Level, Sag in pipe, 5% of the vertical dimension, Finish

Northeast
South-West_805729f6-6de5-4d77-813e-1ce6491aae7e_20191031_120054_791.jpg,
00:09:26, 121.59ft
General Observation

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast South-West_0d537fca-6a77-4f99-97fb-28a14a518e16_20191031_120305_701.jpg, 00:11:19, 168.33ft
Water Level, Sag in pipe, 10% of the vertical dimension

Northeast South-West_67315583-e9cb-4c1a-ba94-af5bcdb1adb9_20191031_120335_474.jpg, 00:11:41, 180.39ft
Deformed, 10% changed

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast South-West_b9c4ef06-2f18-43e8-8cd0-aba396c9e2c9_20191031_120419_104.jpg, 00:12:18, 194.99ft
Deformed, 10% changed

Northeast South-West_9ff89f61-c22a-42dd-bba2-445bafa6dd6a_20191031_120722_269.jpg, 00:15:13, 273.19ft
Deformed, 15% changed

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Section Pictures - 10/31/2019 - Northeast South-West

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**Northeast South-West**	**6**

Northeast South-West_4175cfca-9995-46b8-acc2-f3be414d9d71_20191031_120946_832.jpg, 00:17:24, 341.26ft
Discharge Point

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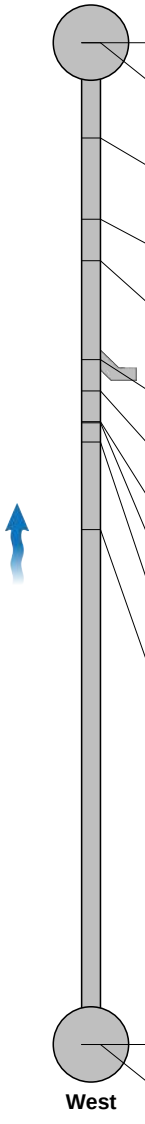
Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**West-Southeast South**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**783.6 '**	**783.6 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**West**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Southeast South**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5915 Distance	Code	Observation	Counter	Photo	Grade
0.00	ADP	Discharge Point / Southeast South	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:07		
74.56	D	Deformed, 15% changed	00:02:47		S5
138.07	D	Deformed, 5% changed	00:05:16		S4
170.53	D	Deformed, 5% changed	00:06:40		S4
247.95	TF	Tap Factory Made at 9 o'clock, 8inch dim	00:10:19		
272.39	D	Deformed, 10% changed	00:12:32		S4
296.46	RFJ	Roots Fine Joint at 1 o'clock, within 8 inch	00:13:36		M1
297.25	RFJ	Roots Fine Joint at 1 o'clock, within 8 inch	00:13:56		M1
312.36	D	Deformed, 15% changed	00:15:07		S5
380.85	D	Deformed, 15% changed	00:18:29		S5
783.62	MSA	Survey Abandoned / Can not pass turn / deformed pipe.	00:38:32		
783.62		End of pipe			

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5343	1200	27.0	2.0	29.0	4.5	1.0	3.6

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**7**

West-Southeast South_eb881e6d-939d-44af-a383-2df5479a2676_20191031_135928_110.jpg, 00:00:00, 0.00ft
Discharge Point

West-Southeast South_32430ced-19bf-4dd5-9cd0-6c8bad2eebde_20191031_140408_990.jpg, 00:02:47, 74.56ft
Deformed, 15% changed

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**7**

West-Southeast South_41aa186b-aec3-4d42-b9fb-3a5abe04f946_20191031_140653_230.jpg, 00:05:16, 138.07ft
Deformed, 5% changed

West-Southeast South_71c2953e-9455-4af4-8cbe-fc0991096e07_20191031_140830_860.jpg, 00:06:40, 170.53ft
Deformed, 5% changed

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**7**

West-Southeast South_49aff70b-8ae0-48a3-94c9-8be63afd766d_20191031_141221_220.jpg, 00:10:19, 247.95ft
Tap Factory Made at 9 o'clock, 8inch dim

West-Southeast South_2d315e9f-a5bb-4dca-98aa-99c6c583b048_20191031_141551_960.jpg, 00:12:32, 272.39ft
Deformed, 10% changed

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**7**

West-Southeast South_e4338f6d-811d-4af8-90f2-807dd0e63c27_20191031_141716_390.jpg, 00:13:36, 296.46ft
Roots Fine Joint at 1 o'clock, within 8 inch

West-Southeast South_f8e9557f-df8f-4bc6-9183-5d22718265db_20191031_141747_650.jpg, 00:13:56, 297.25ft
Roots Fine Joint at 1 o'clock, within 8 inch

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**7**

West-Southeast South_73ab21b1-84d7-48a4-a55e-2ec7e4af2375_20191031_141911_940.jpg, 00:15:07, 312.36ft
Deformed, 15% changed

West-Southeast South_febf1650-48dd-463d-8493-c4e3fbf3bba6_20191031_142242_390.jpg, 00:18:29, 380.85ft
Deformed, 15% changed

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Section Pictures - 10/31/2019 - West-Southeast South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Southeast South**	**7**

West-Southeast South_5597f453-186e-4af6-8b83-b93b28778e1e_20191031_144431_440.jpg, 00:38:32, 783.62ft
Survey Abandoned

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**South-North Central**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**15.7 '**	**15.7 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**South**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**North Central**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:119 Distance	Code	Observation	Counter	Photo	Grade
0.00	ADP	Discharge Point / North Central after jetting.	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:07		
15.74	ATC	Tee Connection at 12 o'clock, 8"inch vertical, 8"inch horizontal / Blind Tee	00:00:50		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

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Section Pictures - 10/31/2019 - South-North Central

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**South-North Central**	**8**

South-North Central_8dc7d76d-a76e-466f-a145-517f92d6a92d_20191031_153154_760.jpg, 00:00:00, 0.00ft
Discharge Point

South-North Central_06741066-205a-465b-8f09-2f74ef4eb135_20191031_153315_767.jpg, 00:00:50, 15.74ft
Tee Connection at 12 o'clock, 8"inch vertical, 8"inch horizontal

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**South-Northwest South**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**327.7 '**	**327.7 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**South**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Northwest South**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:2474	Distance	Code	Observation	Counter	Photo	Grade
Northwest South						
	0.00	ADP	Discharge Point / Northwest South	00:00:00		
	0.00	MWL	Water Level, 5% of the vertical dimension	00:00:07		
	327.74	AEP	End of Pipe / Reached Southwest 90	00:07:15		
South						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

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Section Pictures - 10/31/2019 - South-Northwest South

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**South-Northwest South**	**9**

South-Northwest South_29a41f92-470a-49fc-84b0-a6887a716ff2_20191031_163045_128.jpg, 00:00:00, 0.00ft
Discharge Point

South-Northwest South_e19ea4a1-15b1-40a0-857b-e148e82df634_20191031_163821_498.jpg, 00:07:15, 327.74ft
End of Pipe

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Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
10/31/2019			**Eric Mandery**	**U-117-07006590**	**West-Northwest North**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
		Upstream		**366.0 '**	**366.0 '**

City:	**Elyria, OH**	Drainage Area:		Upstream MH:	**West**
Street:	**1400 Lowell St.**	Media Label:		Up Rim to Invert:	**0.0**
Location Code:		Flow Control:		Downstream MH:	**Northwest North**
Location Details:		Sheet Number:		Down Rim to Invert:	**0.0**
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**8 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Polyethylene**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:2763 Distance	Code	Observation	Counter	Photo	Grade
Northwest North					
0.00	ADP	Discharge Point / Northwest North	00:00:00		
0.00	MWL	Water Level, 5% of the vertical dimension	00:00:07		
43.33	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension	00:01:51		S2
113.43	D	Deformed, 5% changed	00:04:13		S4
168.61	MWLS	Water Level, Sag in pipe, 15% of the vertical dimension	00:05:24		S2
190.61	MWLS	Water Level, Sag in pipe, 15% of the vertical dimension	00:05:54		S2
215.54	MWLS	Water Level, Sag in pipe, 5% of the vertical dimension	00:06:31		S2
231.37	DSC	Deposits Settled Compacted, 30% of cross sectional area from 5 o'clock to 7 o'clock / Large rock.	00:07:49		M4
283.05	TF	Tap Factory Made at 9 o'clock, 8inch dim	00:19:25		
366.01	MSA	Survey Abandoned / Can not pass rock in pipe.	00:19:19		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
4124	4100	12.0	4.0	16.0	2.4	4.0	2.7

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Section Pictures - 10/31/2019 - West-Northwest North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northwest North**	**10**

West-Northwest North_cb81c48d-c1ea-4d3c-8d46-3f402b0332e8_20191031_164420_799.jpg, 00:00:00, 0.00ft
Discharge Point

West-Northwest North_fb35bbfa-4ef4-4e11-8a5c-fd901d9f234b_20191031_164703_919.jpg, 00:01:51, 43.33ft
Water Level, Sag in pipe, 5% of the vertical dimension

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Section Pictures - 10/31/2019 - West-Northwest North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northwest North**	**10**

West-Northwest North_a5e83abd-640c-48b3-85dc-1658b2f65cc1_20191031_164933_745.jpg, 00:04:13, 113.43ft
Deformed, 5% changed

West-Northwest North_f02b48c5-eb0e-464b-b8e1-710315b35063_20191031_165051_248.jpg, 00:05:24, 168.61ft
Water Level, Sag in pipe, 15% of the vertical dimension

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Section Pictures - 10/31/2019 - West-Northwest North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northwest North**	**10**

West-Northwest North_ca734e12-2f34-4ed3-a41a-3430a3983c3d_20191031_165127_672.jpg, 00:05:54, 190.61ft
Water Level, Sag in pipe, 15% of the vertical dimension

West-Northwest North_c74a3a49-e418-4e00-b0e2-92986ead7913_20191031_165209_892.jpg, 00:06:31, 215.54ft
Water Level, Sag in pipe, 5% of the vertical dimension

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Section Pictures - 10/31/2019 - West-Northwest North

City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northwest North**	**10**

West-Northwest North_957cc09e-f12b-4a4c-819d-0f488dac6699_20191031_165344_997.jpg, 00:07:49, 231.37ft
Deposits Settled Compacted, 30% of cross sectional area from 5 o'clock to 7 o'clock

West-Northwest North_975e1557-2be2-4e96-95cd-c2f3cdd89d43_20191031_170632_694.jpg, 00:19:25, 283.05ft
Tap Factory Made at 9 o'clock, 8inch dim

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Section Pictures - 10/31/2019 - West-Northwest North

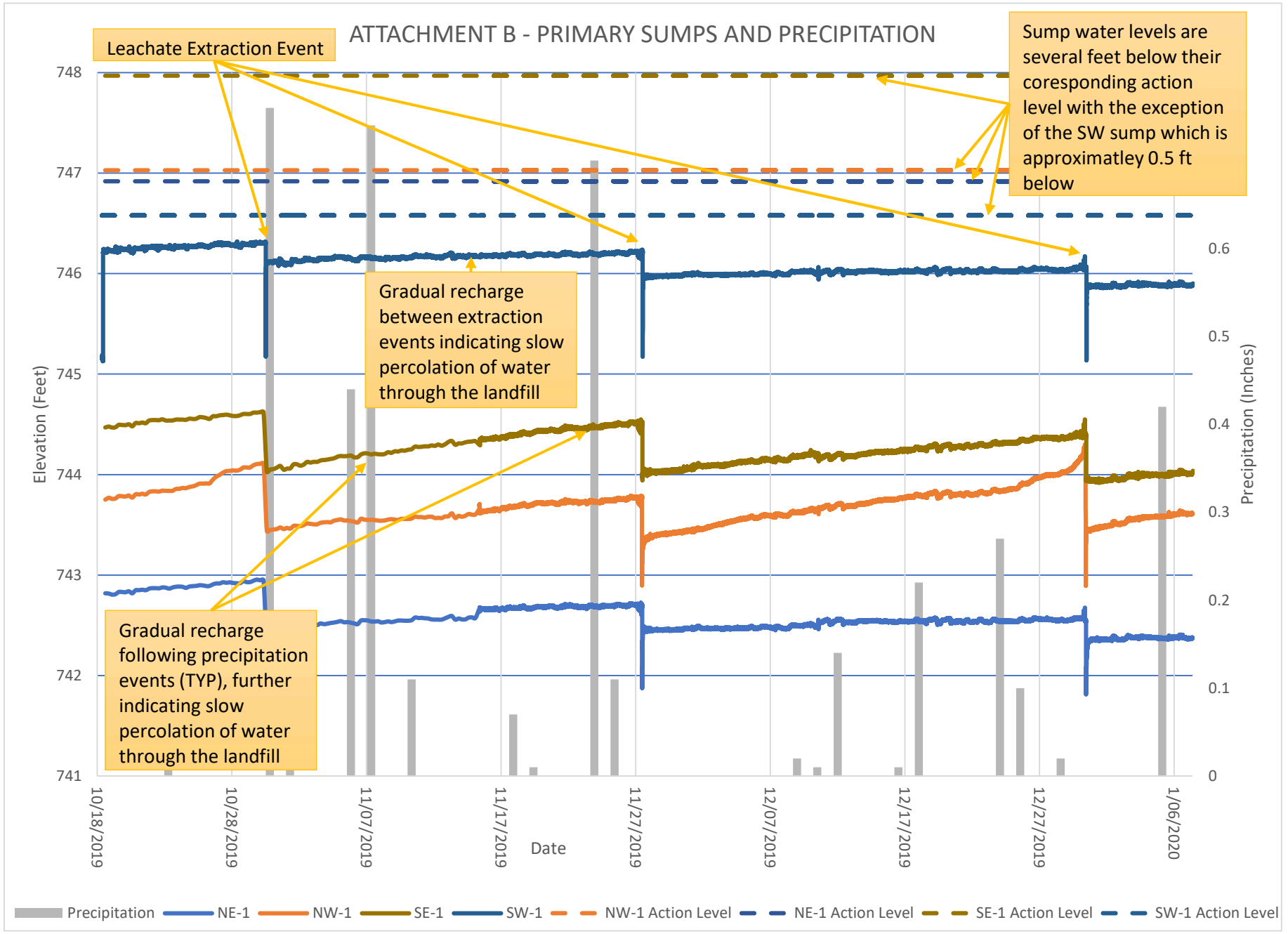
City	Street	Date	Pipe Segment Reference	Nr.
Elyria, OH	**1400 Lowell St.**	**10/31/2019**	**West-Northwest North**	**10**

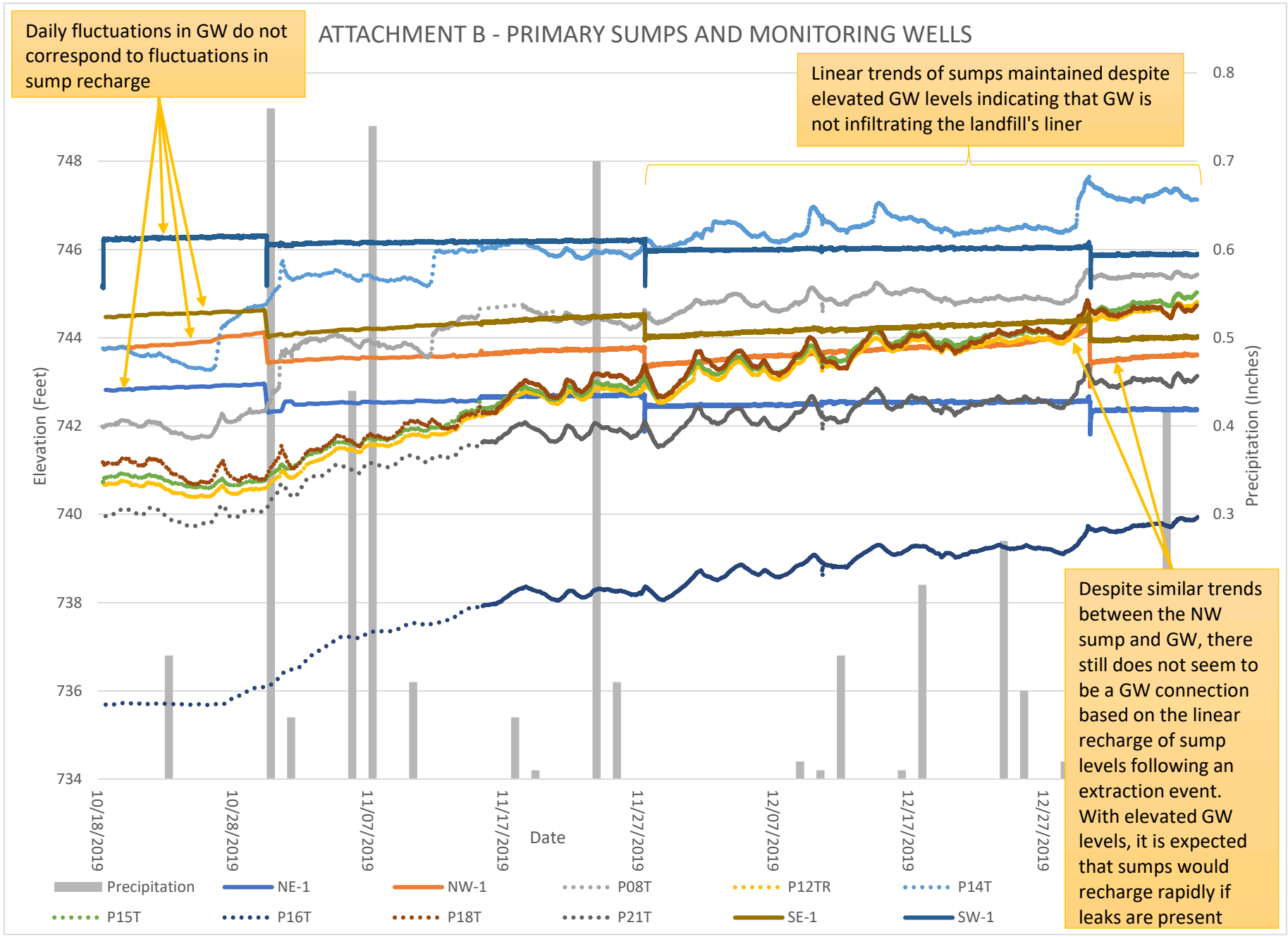
West-Northwest North_e7581d69-34c0-4206-804a-650cc7b137ea_20191031_170647_860.jpg, 00:19:25, 283.05ft
Tap Factory Made at 9 o'clock, 8inch dim

West-Northwest North_87471a83-3fa7-413f-9d93-bca947bb9266_20191031_170526_753.jpg, 00:19:19, 366.01ft
Survey Abandoned

ATTACHMENT B

Annotated Transducer Study Charts


ATTACHMENT B - PRIMARY SUMPS AND PRECIPITATION
Leachate Extraction Event
Sump water levels are several feet below their coresponding action level with the exception of the SW sump which is approximatley 0.5 ft below
Gradual recharge between extraction events indicating slow percolation of water through the landfill
Gradual recharge following precipitation events (TYP), further indicating slow percolation of water through the landfill
Elevation (Feet)
748
747
746
745
744
743
742
741
Precipitation (Inches)
0.6
0.5
0.4
0.3
0.2
0.1
0
10/18/2019
10/28/2019
11/07/2019
11/17/2019
11/27/2019
12/07/2019
12/17/2019
12/27/2019
1/06/2020
Date
Precipitation
NE-1
NW-1
SE-1
SW-1
NW-1 Action Level
NE-1 Action Level
SE-1 Action Level
SW-1 Action Level


ATTACHMENT B - PRIMARY SUMPS AND MONITORING WELLS
Daily fluctuations in GW do not correspond to fluctuations in sump recharge
Linear trends of sumps maintained despite elevated GW levels indicating that GW is not infiltrating the landfill's liner
Despite similar trends between the NW sump and GW, there still does not seem to be a GW connection based on the linear recharge of sump levels following an extraction event. With elevated GW levels, it is expected that sumps would recharge rapidly if leaks are present
Elevation (Feet)
Precipitation (Inches)
Date
748
746
744
742
740
738
736
734
0.8
0.7
0.6
0.5
0.4
0.3
10/18/2019
10/28/2019
11/07/2019
11/17/2019
11/27/2019
12/07/2019
12/17/2019
12/27/2019
Precipitation
NE-1
NW-1
P08T
P12TR
P14T
P15T
P16T
P18T
P21T
SE-1
SW-1

APPENDIX C

Tank Closure Memorandum

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

16 November 2017
File No. 129862-002

TO: Pam Barnett

FROM: Haley & Aldrich, Inc.
Ban Aragona
Lloyd Ross

SUBJECT: RCRA Generator Closure Documentation
Above Ground Storage Tanks RACER Trust Elyria
1400 Lowell St
Elyria, Ohio

The purpose of this memorandum is to document the generator closure activities completed at the RACER Trust Elyria Site (Site) located at 1400 Lowell Street, Elyria, Ohio. A RCRA Tank System was historically used to manage leachate at the Site. These tanks were installed and operated as short-term storage units (less than 90-days) for collected hazardous waste leachates from the adjacent former landfill, as shown in **Figure 1**.

Based on change in operations, the ASTs are no longer required to manage the leachate from the landfill. Therefore, the tanks and secondary containment were decontaminated to allow for generator closure and removal of the tank system from the Site. The decontamination of the tank system was completed in accordance with performance standards in Ohio Administrative Code (3745-66-11).

This tank system includes two ASTs with a 1,000-gallon capacity. Each tank is constructed of double-walled fiberglass reinforced plastic that is designed for the storage of liquid containing heavy metals contamination. The ASTs are equipped with a secondary containment system that includes a continuously bermed 12-inch, reinforced concrete pad underlain by a polyethylene liner.

Closure Activities

The closure activities included cleaning of tanks, associated piping and secondary containment and collection of samples from the collected solids and cleaning water.

Environmental Management Specialists (EMS) of Cleveland, Ohio performed the AST cleaning. The tanks and associated piping, including approximately 300 feet of influent piping, was jet cleaned and rinsed with high-pressure hot water. Similarly, the concrete of the secondary containment was rinsed,

scrubbed and high-pressure cleaned and rinsed with hot water. Solids and the cleaning and rinse water was containerized for disposal. The interior of the ASTs was triple rinsed with high pressure hot water. Rinsate liquid was removed and containerized for disposal.

Photographs of the closure activities are provided in **Appendix A**.

Sampling

Tank cleaning residuals generated during tank cleaning activities were sampled on May 16, 2017. The tank residuals sample, 0171-051617-1400, was analyzed for toxicity characteristic leaching procedure (TCLP) VOCs, TCLP SVOCs, TCLP Metals, TCLP Mercury total cyanide, and total sulfide in accordance with EPA SW-846 Methods 8260B, 8270C, 6010C, 7470A, 9012B and 9034, respectively. The final rinsate sample, 0171-051617-1330, was analyzed for total metals and total cyanide in accordance with EPA SW-846 Methods 7470A and 9012B, respectively. These data were used for disposal of the material.

On June 18, 2017, a clean rinse of the tank system was completed and a final rinse water and rinsate samples were collected to verify decontamination of the tank systems. Both samples, 0171-061917-1900 and 0171-061917-1915, were analyzed for total metals (ICP) and total mercury in accordance with EPA SW-846 Methods 6010C and 7470A respectively.

The tank residual sample was screened against hazardous waste regulatory levels and the final rinsate samples were screened against maximum contamination levels (MCLs) for drinking water quality. **Tables I, II and III** summarize the analytical data reported for these samples. Laboratory analytical reports are provided in **Appendix B**. Samples collected during the closure activities were either below applicable screening criteria or non-detect.

Based on the final rinsate sample results, the tanks system has been adequately decontaminated and can be decommissioned and disposed of accordingly.

Waste Handling

Approximately 318 gallons of rinsate from tank cleaning activities was collected and transported off Site by Vickery Transportation, Inc. and properly disposed at Vickery Environmental, Inc. located at 3956 State Route 412, Vickery, Ohio 43464. Waste manifests for the rinsate disposed off Site are provided in **Appendix C**. A generator waste profile was created by Chemical Waste Management, Inc. and is provided in **Appendix D**.

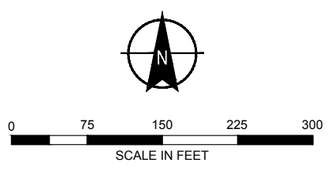
Attachments:
Figure I – AST Location Plan
Table I – Tank Sample Analytical Results
Table II – Rinsate Sample Analytical Results
Table III – Water and Rinsate Sample Analytical Results
Appendix A – Photographs
Appendix B – Analytical Reports
Appendix C – Waste Manifests
Appendix D – Waste Profile

FIGURES

LEGEND

NOTES

1.



HALEY ALDRICH

RACER TRUST ELYRIA
1400 LOWELL STREET
ELYRIA, OH 44035

AST LOCATION PLAN

SCALE: AS SHOWN
SEPTEMBER 2017

FIGURE 1

BLACKWELL, JOSEPH Printed: 9/19/2017 10:03 AM Layout: HA-FIG-D-L
G:\129862_RACER ELYRIA\CAD\129862_SITE_PLAN.DWG

TABLES

TABLE I
SUMMARY OF ANALYTICAL RESULTS
RACER ELYRIA
ELYRIA, OH

Location	Hazardous Waste	Tanks
Sample Date	Regulatory	05/16/2017
Sample Name	Levels	0171-051617-1400
Inorganic Compounds (mg/kg)		
Cyanide	-	ND (0.1) F2F1
Sulfide	-	ND (8.7) F1
Inorganic Compounds (ug/L)		
Arsenic	5000	ND (75)
Barium	100000	**170 J**
Cadmium	1000	ND (20)
Chromium	5000	ND (50)
Lead	5000	ND (50)
Mercury	200	ND (0.2)
Selenium	1000	ND (100)
Silver	5000	ND (50)
Other		
Density (g/cm3)	-	**2.36**
Burn Rate (mm/sec)	-	ND (2.2)
Specific gravity (none)	-	**2.37**
pH (lab) (SU)	-	**8.5 HF**
Semi-Volatile Organic Compounds (ug/L)		
1,4-Dichlorobenzene	7500	ND (10)
2,4,5-Trichlorophenol	400000	ND (10)
2,4,6-Trichlorophenol	2000	ND (10)
2,4-Dinitrotoluene	130	ND (2)
2-Methylphenol (o-Cresol)	200000	ND (10)
3&4-Methylphenol	-	ND (10)
4-Methylphenol	200000	ND (10)
Hexachlorobenzene	130	ND (1)
Hexachlorobutadiene	500	ND (2)
Hexachloroethane	3000	ND (1) *
Nitrobenzene	2000	ND (1)
Pentachlorophenol	100000	ND (30)
Phenol	-	ND (10)
Pyridine	5000	ND (10)
Volatile Organic Compounds (ug/L)		
1,1-Dichloroethene	700	ND (10)
1,2-Dichloroethane	500	ND (10)
2-Butanone (Methyl Ethyl Ketone)	200000	ND (50)
Benzene	500	ND (10)
Carbon tetrachloride	500	ND (10)
Chlorobenzene	100000	ND (10)
Chloroform (Trichloromethane)	6000	ND (10)
Tetrachloroethene	700	ND (10)
Trichloroethene	500	ND (10)
Vinyl chloride	200	ND (10)

Notes:
1. ND (#): Not detected above reporting limit.
2. Results in **bold** are detected.
3. Lab qualifiers defined as follows:
   *: LCS or LCSD is outside acceptance limits.
   J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
   HF: Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
   F1: MS and/or MSD Recovery is outside acceptance limits.
   F2: MS/MSD RPD exceeds control limits
4. Results in red exceed Hazardous Waste Regulatory Levels.

TABLE II
SUMMARY OF ANALYTICAL RESULTS
RACER ELYRIA
ELYRIA, OH

	Location		Rinsate
	Sample Date		05/16/2017
	Sample Name	MCLs	0171-051617-1330
Inorganic Compounds (ug/L)			
Barium		2000	**37 J**
Calcium		-	**36000**
Chromium		100	**7.6 J**
Cyanide		200	**24**
Iron		-	**1300**
Magnesium		-	**9200**
Manganese		-	**40**
Nickel		-	ND (40)
Potassium		-	**16000**
Sodium		-	**14000**
Other (ug/L)			
Chloride		-	**27000 F1**
Sulfate		-	**56000 F1**

Notes:
1. ND (#): Not detected above reporting limit.
2. Results in **bold** are detected.
3. Lab qualifiers defined as follows:
   *: LCS or LCSD is outside acceptance limits.
   J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
   HF: Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
   F1: MS and/or MSD Recovery is outside acceptance limits.
   F2: MS/MSD RPD exceeds control limits
4. Results in red exceed MCLs.

TABLE III
SUMMARY OF ANALYTICAL RESULTS
RACER ELYRIA
ELYRIA, OH

Location		Source Water	Rinsate
Sample Date		6/19/2017	6/19/2017
Sample Name	MCLs	0171-061917-1900	0171-061917-1915
Inorganic Compounds (ug/L)			
Arsenic	10	ND (15)	ND (15)
Barium	2000	ND (200)	ND (200)
Cadmium	5.0	ND(4.0)	ND(4.0)
Chromium	100	ND (10)	ND (10)
Lead	15	ND(10)	ND(10)
Selenium	50	ND (20)	ND (20)
Silver	-	ND (10)	ND (10)
Other (ug/L)			
Mercury	2	ND (0.2)	ND (0.2)

Notes:
1. ND (#): Not detected above reporting limit.
2. Results in **bold** are detected.
3. Lab qualifiers defined as follows:
   *: LCS or LCSD is outside acceptance limits.
   J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
   HF: Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
   F1: MS and/or MSD Recovery is outside acceptance limits.
   F2: MS/MSD RPD exceeds control limits
4. Results in red exceed MCLs.

APPENDIX A

Photographs

Photo #1: AST shown inside building

Photo #2: AST Interior

Photo #3: Concrete pad of secondary containment system

Photo #4: EMS removes liquids from AST

Photo #5: EMS Power washing interior of AST

Photo #6: Vickery transporting rinsate off Site

Photo #7: Termination of electrical feed

Photo #8: Influent piping cut and removed

APPENDIX B

Laboratory Analytical Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-81262-1
Client Project/Site: Racer - Elyria, Ohio

For:
Haley & Aldrich, Inc.
3840 Packard Road
Suite 100
Ann Arbor, Michigan 48108-2280

Attn: Ban Aragona

Denise Pohl

Authorized for release by:
7/5/2017 3:37:17 PM

Denise Pohl, Project Manager II
(330)966-9789
denise.pohl@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Table of Contents 2
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Client Sample Results 8
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QC Association Summary 11
Lab Chronicle 12
Certification Summary 13
Chain of Custody 14
Receipt Checklists 22

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Qualifiers

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-81262-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Haley & Aldrich, Inc.

Project: Racer - Elyria, Ohio

Report Number: 240-81262-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 6/20/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 21.8º C.

TOTAL METALS (ICP)

Samples 0171-061917-1900 (240-81262-1) and 0171-061917-1915 (240-81262-2) were analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/22/2017 and analyzed on 06/23/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Samples 0171-061917-1900 (240-81262-1) and 0171-061917-1915 (240-81262-2) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 06/28/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL EDI
7470A	Mercury (CVAA)	SW846	TAL EDI

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-81262-1	0171-061917-1900	Water	06/19/17 19:00	06/20/17 09:30
240-81262-2	0171-061917-1915	Water	06/19/17 19:15	06/20/17 09:30

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Client Sample ID: 0171-061917-1900 **Lab Sample ID: 240-81262-1**

No Detections.

Client Sample ID: 0171-061917-1915 **Lab Sample ID: 240-81262-2**

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: 0171-061917-1900
Date Collected: 06/19/17 19:00
Date Received: 06/20/17 09:30

Lab Sample ID: 240-81262-1
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	10	U	10	1.8	ug/L		06/22/17 22:30	06/23/17 19:00	1
Arsenic	15	U	15	4.4	ug/L		06/22/17 22:30	06/23/17 19:00	1
Barium	200	U	200	8.6	ug/L		06/22/17 22:30	06/23/17 19:00	1
Cadmium	4.0	U	4.0	1.8	ug/L		06/22/17 22:30	06/23/17 19:00	1
Chromium	10	U	10	3.3	ug/L		06/22/17 22:30	06/23/17 19:00	1
Lead	10	U	10	4.1	ug/L		06/22/17 22:30	06/23/17 19:00	1
Selenium	20	U	20	4.4	ug/L		06/22/17 22:30	06/23/17 19:00	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		06/28/17 12:55	06/28/17 15:05	1

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Client Sample ID: 0171-061917-1915
Date Collected: 06/19/17 19:15
Date Received: 06/20/17 09:30

Lab Sample ID: 240-81262-2
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	10	U	10	1.8	ug/L		06/22/17 22:30	06/23/17 19:04	1
Arsenic	15	U	15	4.4	ug/L		06/22/17 22:30	06/23/17 19:04	1
Barium	200	U	200	8.6	ug/L		06/22/17 22:30	06/23/17 19:04	1
Cadmium	4.0	U	4.0	1.8	ug/L		06/22/17 22:30	06/23/17 19:04	1
Chromium	10	U	10	3.3	ug/L		06/22/17 22:30	06/23/17 19:04	1
Lead	10	U	10	4.1	ug/L		06/22/17 22:30	06/23/17 19:04	1
Selenium	20	U	20	4.4	ug/L		06/22/17 22:30	06/23/17 19:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		06/28/17 12:55	06/28/17 15:06	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 460-445287/1-A
Matrix: Water
Analysis Batch: 445450

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 445287

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	10	U	10	1.8	ug/L		06/22/17 22:30	06/23/17 17:03	1
Arsenic	15	U	15	4.4	ug/L		06/22/17 22:30	06/23/17 17:03	1
Barium	200	U	200	8.6	ug/L		06/22/17 22:30	06/23/17 17:03	1
Cadmium	4.0	U	4.0	1.8	ug/L		06/22/17 22:30	06/23/17 17:03	1
Chromium	10	U	10	3.3	ug/L		06/22/17 22:30	06/23/17 17:03	1
Lead	10	U	10	4.1	ug/L		06/22/17 22:30	06/23/17 17:03	1
Selenium	20	U	20	4.4	ug/L		06/22/17 22:30	06/23/17 17:03	1

Lab Sample ID: LCS 460-445287/2-A
Matrix: Water
Analysis Batch: 445450

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 445287

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	46.9		ug/L		94	80 - 120
Arsenic	2000	1940		ug/L		97	80 - 120
Barium	2000	2050		ug/L		103	80 - 120
Cadmium	50.0	50.4		ug/L		101	80 - 120
Chromium	200	203		ug/L		101	80 - 120
Lead	500	518		ug/L		104	80 - 120
Selenium	2000	1950		ug/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 460-446399/1-A
Matrix: Water
Analysis Batch: 446460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 446399

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		06/28/17 12:55	06/28/17 14:38	1

Lab Sample ID: LCS 460-446399/2-A
Matrix: Water
Analysis Batch: 446460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 446399

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.00	0.918		ug/L		92	80 - 120

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Metals

Prep Batch: 445287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81262-1	0171-061917-1900	Total/NA	Water	3010A	
240-81262-2	0171-061917-1915	Total/NA	Water	3010A	
MB 460-445287/1-A	Method Blank	Total/NA	Water	3010A	
LCS 460-445287/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 445450

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81262-1	0171-061917-1900	Total/NA	Water	6010C	445287
240-81262-2	0171-061917-1915	Total/NA	Water	6010C	445287
MB 460-445287/1-A	Method Blank	Total/NA	Water	6010C	445287
LCS 460-445287/2-A	Lab Control Sample	Total/NA	Water	6010C	445287

Prep Batch: 446399

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81262-1	0171-061917-1900	Total/NA	Water	7470A	
240-81262-2	0171-061917-1915	Total/NA	Water	7470A	
MB 460-446399/1-A	Method Blank	Total/NA	Water	7470A	
LCS 460-446399/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 446460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81262-1	0171-061917-1900	Total/NA	Water	7470A	446399
240-81262-2	0171-061917-1915	Total/NA	Water	7470A	446399
MB 460-446399/1-A	Method Blank	Total/NA	Water	7470A	446399
LCS 460-446399/2-A	Lab Control Sample	Total/NA	Water	7470A	446399

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Client Sample ID: 0171-061917-1900

Lab Sample ID: 240-81262-1

Date Collected: 06/19/17 19:00

Matrix: Water

Date Received: 06/20/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			445287	06/22/17 22:30	GAE	TAL EDI
Total/NA	Analysis	6010C		1	445450	06/23/17 19:00	CDC	TAL EDI
Total/NA	Prep	7470A			446399	06/28/17 12:55	RBS	TAL EDI
Total/NA	Analysis	7470A		1	446460	06/28/17 15:05	RBS	TAL EDI

Client Sample ID: 0171-061917-1915

Lab Sample ID: 240-81262-2

Date Collected: 06/19/17 19:15

Matrix: Water

Date Received: 06/20/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			445287	06/22/17 22:30	GAE	TAL EDI
Total/NA	Analysis	6010C		1	445450	06/23/17 19:04	CDC	TAL EDI
Total/NA	Prep	7470A			446399	06/28/17 12:55	RBS	TAL EDI
Total/NA	Analysis	7470A		1	446460	06/28/17 15:06	RBS	TAL EDI

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 240-81262-1

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	01-31-18
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17 *
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17 *
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-17
Wisconsin	State Program	5	999518190	08-31-17 *

Laboratory: TestAmerica Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-18
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-17
New Jersey	NELAP	2	12028	06-30-18
New York	NELAP	2	11452	04-01-18
Pennsylvania	NELAP	3	68-00522	02-28-18
Rhode Island	State Program	1	LAO00132	12-30-17
USDA	Federal		NJCA-003-08	06-13-20

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

21.8|21.8

TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Correll	Lab PM: Pohl, Denise	Carrier Tracking No(s):	COC No: 460-85353-53395.1
Client Contact: Anthony Correll	Phone: 216-407-1168	E-Mail: denise.pohl@testamericainc.com		Page: Page 1 of 1
Company: Haley & Aldrich, Inc.				Job #:

Address: 6500 Rockside Road Suite 200	Due Date Requested: —
City: Cleveland	TAT Requested (days): Std
State, Zip: OH, 44131	
Phone: 734-454-4917(Tel) 734-454-1233(Fax)	PO #: 41753-005
Email: acorreli@haleyaldrich.com	WO #:
Project Name: Racer - Elyria, Ohio	Project #: 46020356
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RCRA Metals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
0171-061917-1900	6/19/17	1900	G	W			X		Source Water
0171-061917-1915	↓	1915	G	W			X		Final Rinsate

240-81262 Chain of Custody

TJC 6/19/17

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
TJ Correll	6/19/17 @ 2030	H+A		6/20/17 930	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

8/2/17

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Haley & Aldrich Site Name _____ Cooler unpacked by:

Cooler Received on 6/20/17 Opened on 6/20/17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box ~~Client Cooler~~ Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-8 (CF **-0.4** °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #36 (CF **+0**°C) Observed Cooler Temp 21.8 °C Corrected Cooler Temp. 21.8 °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were custody seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels be reconciled with the COC?	Yes	No
9. Were correct bottle(s) used for the test(s) indicated?	Yes	No
10. Sufficient quantity received to perform indicated analyses?	Yes	No
11. Are these work share samples?	Yes	No
If yes, Questions 11-15 have been checked at the originating laboratory.		
11. Were sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# **HC697954**
12. Were VOAs on the COC?	Yes	No
13. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
15. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
\\tacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-052317 Cooler Receipt Form.doc djl

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
EB-AUG-20170607	240-80625-D-1	Plastic 500ml - with Nitric Acid	<2	_____	_____
EB-SPOON-20170607	240-80625-G-2	Plastic 500ml - with Nitric Acid	<2	_____	_____

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone (330) 497-9396 Fax (330) 497-0772

0.5/0.5
1-3/1.3

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: D. Miller / T. Asher	Lab PM: Howell, Leslie	Carrier Tracking No(s):	COC No: 240-43577-18975.1
Client Contact: David Miller	Phone: 517-349-9499	E-Mail: leslie.howell@testamericainc.com		Page: Page 1 of 1
Company: Stantec Consulting Corp.				Job #:
Address: 2321 Club Meridian Drive Suite E	Due Date Requested:			
City: Okemos	TAT Requested (days): Standard			
State, Zip: MI, 48864				
Phone: (517) 349-9499	PO #: Purchase Order not required			
Email: david.miller@stantec.com	WO #:			
Project Name: Chevron BDG Company (Former Harshaw Chem	Project #: 24018459			
Site: 213202036	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 6020, 7470A	8260B - (MOD) TCL OLM03.1/4.2 Volatile Analyte L	8270C - (MOD) OLM03.1/4.2 Semivolatile Analyte L	9056A_28D - (MOD) Pick List	8082 - (MOD) PCB 7 Aroclors	6010B, 7470A, 8260B, 8270C	9040B - pH	6010A - Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	A	N	N	N	N	N			
PZ-3	6/20/17	11:39	G	Water	N	N	X	X	X	X					7	
1A10-MW0016		13:08	G	Water	N	N	X	X	X	X					7	
1A10-MW0017		14:38	G	Water	N	N	X	X	X	X					7	
1A10-MW0018		16:20	G	Water	N	N	X	X	X	X					7	
1A10-MW0019		18:05	G	Water	N	N	X	X	X	X					7	
DUP-1		—	G	Water	N	N	X	X	X	X					6	
EB-1		15:20	G	Water	N	N	X	X	X	X					7	
TRIP Blank			G	Water	N	N		X							1	

240-81282 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: Ohio VAP Program

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: Delivery

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	6/21/17 10:15	Stantec	[signature]	6/21/17 1015	TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

7/5/2017

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 81282**
Canton Facility

Client SANTEC Site Name — Cooler unpacked by: RP

Cooler Received on 6-21-17 Opened on 6-21-17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.4** °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #36 (CF **+0**°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No 6-21-17 RP
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC697954**
12. Were VOAs on the COC? Yes No
13. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes No
15. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

~~Did not Receive FB.~~ Found 6/21/17 BM

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

TestAmerica Multiple Cooler Receipt Form/Narrative **Login # : 81282**
Canton Facility

Cooler #	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant
CLIENT	36	0.5	0.5	Ice
	1	1.3	1.3	1

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
PZ-3	240-81282-E-1	Plastic 500ml - with Nitric Acid	<2	_____	_____
1A10-MW0016	240-81282-E-2	Plastic 500ml - with Nitric Acid	<2	_____	_____
1A10-MW0017	240-81282-E-3	Plastic 500ml - with Nitric Acid	<2	_____	_____
1A10-MW0018	240-81282-E-4	Plastic 500ml - with Nitric Acid	<2	_____	_____
1A10-MW0019	240-81282-E-5	Plastic 500ml - with Nitric Acid	<2	_____	_____
DUP-1	240-81282-E-6	Plastic 500ml - with Nitric Acid	<2	_____	_____
EB-1	240-81282-E-7	Plastic 500ml - with Nitric Acid	<2	_____	_____

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone (330) 497-9396 Fax (330) 497-0772

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

7/5/2017

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Pohl, Denise	Carrier Tracking No(s):	COC No: 240-72560.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: denise.pohl@testamericainc.com	State of Origin: Ohio	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-81262-1
Address: 777 New Durham Road, ,	Due Date Requested: 6/30/2017			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer - Elyria, Ohio	Project #: 46020356			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3010A (MOD) RCRA 8 Analyte List	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
0171-061917-1900 (240-81262-1)	6/19/17	19:00 Eastern		Water			X	X	1	
0171-061917-1915 (240-81262-2)	6/19/17	19:15 Eastern		Water			X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		6217 1730	240	via FedEx	6/22/17 1055	TAL CAN
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 10 05	Cooler Temperature(s) °C and Other Remarks: 3.8°C IR8

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 240-81262-1

Login Number: 81262
List Number: 2
Creator: Armbruster, Chris

List Source: TestAmerica Edison
List Creation: 06/22/17 01:22 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.8°C IR8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Tel: (732)549-3900

TestAmerica Job ID: 460-133539-1
Client Project/Site: Racer - Elyria, Ohio

For:
Haley & Aldrich, Inc.
3840 Packard Road
Suite 100
Ann Arbor, Michigan 48108-2280

Attn: Ban Aragona

Denise Pohl

Authorized for release by:
6/1/2017 8:57:38 AM

Denise Pohl, Project Manager II
(330)966-9789
denise.pohl@testamericainc.com

LINKS

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Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD is outside acceptance limits.

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.
F2	MS/MSD RPD exceeds control limits
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 460-133539-1

Laboratory: TestAmerica Edison

Narrative

CASE NARRATIVE

Client: Haley & Aldrich, Inc.

Project: Racer - Elyria, Ohio

Report Number: 460-133539-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The D854 Specific Gravity analysis was performed at the TestAmerica Knoxville Laboratory.

TestAmerica Edison attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 5/17/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5º C.

TCLP VOLATILE ORGANIC COMPOUNDS (GCMS)

Sample 0171-051617-1400 (460-133539-2) was analyzed for TCLP volatile organic compounds (GCMS) in accordance with EPA SW-846 Methods 1311/8260B. The sample was leached on 05/18/2017 and analyzed on 05/25/2017.

Sample 0171-051617-1400 (460-133539-2)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Method(s) 8260B: The continuing calibration verification (CCV) associated with batch 439597 recovered above the upper control limit for Vinyl chloride. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GCMS)

Job ID: 460-133539-1 (Continued)

Laboratory: TestAmerica Edison (Continued)

Sample 0171-051617-1400 (460-133539-2) was analyzed for TCLP semivolatile organic compounds (GCMS) in accordance with EPA SW-846 Methods 1311/8270C. The sample was leached on 05/18/2017, prepared on 05/19/2017 and analyzed on 05/26/2017.

Surrogates are added during the extraction process prior to dilution. When the sample is diluted, surrogate recoveries are diluted out and no corrective action is required.

Hexachloroethane failed the recovery criteria high for LCS 460-438125/2-A. Hexachloroethane failed the recovery criteria high for LCSD 460-438125/3-A. Refer to the QC report for details.

Method(s) 8270C: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 460-438125 and analytical batch 460-438659 recovered outside control limits for the following analyte: Hexachloroethane. This analyte was biased high in the LCS/LCSD and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP METALS (ICP)

Sample 0171-051617-1400 (460-133539-2) was analyzed for TCLP metals (ICP) in accordance with EPA SW-846 Methods 1311/6010C. The sample was leached on 05/18/2017, prepared on 05/19/2017 and analyzed on 05/20/2017 and 05/23/2017.

Lead was detected in method blank LB 460-438149/1-B at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL METALS (ICP)

Sample 0171-051617-1330 (460-133539-1) was analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010C. The sample was prepared and analyzed on 05/31/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP MERCURY

Sample 0171-051617-1400 (460-133539-2) was analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The sample was leached on 05/18/2017, and prepared and analyzed on 05/23/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FLASHPOINT

Sample 0171-051617-1400 (460-133539-2) was analyzed for flashpoint in accordance with EPA SW-846 Method 1030. The sample was analyzed on 05/30/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL CYANIDE

Sample 0171-051617-1400 (460-133539-2) was analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The sample was prepared and analyzed on 05/30/2017.

Cyanide, Total failed the recovery criteria low for the MS of sample 0171-051617-1400MS (460-133539-2) in batch 460-440110. Cyanide, Total failed the recovery criteria low for the MSD of sample 0171-051617-1400MSD (460-133539-2) in batch 460-440110. Cyanide, Total exceeded the RPD limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL CYANIDE

Sample 0171-051617-1330 (460-133539-1) was analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The sample

Job ID: 460-133539-1 (Continued)

Laboratory: TestAmerica Edison (Continued)

was prepared and analyzed on 05/30/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SULFIDE
Sample 0171-051617-1400 (460-133539-2) was analyzed for total sulfide in accordance with EPA SW-846 Method 9034. The sample was prepared and analyzed on 05/21/2017.

Sulfide failed the recovery criteria low for the MS/MSD of sample 0171-051617-1400MS/MSD (460-133539-2) in batch 460-438817.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PH
Sample 0171-051617-1400 (460-133539-2) was analyzed for pH in accordance with EPA SW-846 Method 9045D. The sample was analyzed on 05/30/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS, ION CHROMATOGRAPHY
Sample 0171-051617-1330 (460-133539-1) was analyzed for Anions, Ion Chromatography in accordance with SW-846 Method 9056A_OrgFM. The sample was analyzed on 05/28/2017.

Chloride and Sulfate failed the recovery criteria high for the MS/MSD of sample 0171-051617-1330MS/MSD (460-133539-1) in batch 460-439827.

Sample 0171-051617-1330 (460-133539-1)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Method(s) 9056A: The following samples were diluted to bring the concentration of target analytes within the calibration range: 0171-051617-1330 (460-133539-1), (460-133539-A-1 DU), (460-133539-A-1 MS) and (460-133539-A-1 MSD) at 10.0, 10.0, 10.0 and 10.0. Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SPECIFIC GRAVITY
Sample 0171-051617-1400 (460-133539-2) was analyzed for specific gravity in accordance with ASTM Method D854. The sample was analyzed on 05/20/2017.

Density: The density (or specific gravity) of the samples was determined using SOP number KNOX-WC-0015, based on ASTM Methods D1475 (replaced D1963) and D854. A Hubbard-Carmick type pycnometer is tared on a four-place analytical balance. The pycnometer filled with water is weighed to calibrate the volume at the desired temperature. The pycnometer filled with sample is weighed to determine the weight of the sample at the calibrated volume. The standard temperature for this procedure is 25ºC. The density and specific gravity of the material are calculated using the following equations:

d(SAMP) = [C(T) - A] / V(T)

Where:
d(SAMP) = Density of the liquid sample at temperature T, g/cm3
C(T) = Weight of pycnometer filled with sample at temperature T, g
A = Weight of pycnometer, g
V(T) = Volume of pycnometer at temperature T, cm3

d(SAMP) = [C(T) - A] / [V(T) - [(D(T) - C(T)) / dH2O(T)]]

Where:

Job ID: 460-133539-1 (Continued)

Laboratory: TestAmerica Edison (Continued)

d(SAMP) = Density of the solid sample at temperature T, g/cm3
D(T) = Weight of pycnometer filled with water and an aliquot of the sample at temperature T, g
C(T) = Weight of pycnometer partially filled with an aliquot of the sample at temperature T, g
A = Weight of pycnometer, g
dH2O(T) = Density of pure water at temperature T, g/cm3
V(T) = Volume of pycnometer at temperature T, cm3

S(T) = d(SAMP) / dH2O(T)

Where:
S(T) = Specific gravity of the sample at temperature T, unitless
d(SAMP) = Density of the sample at temperature T, g/cm3
dH2O(T) = Density of pure water at temperature T, g/cm3
T = Temperature of analysis

Conversion factors:
1 lb/gal = 0.1198 g/cm3
1 Kg/cu. m = 0.001 g/cm3

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Client Sample ID: 0171-051617-1330 — Lab Sample ID: 460-133539-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride - DL	27	F1	1.2	0.31	mg/L	10		9056A	Total/NA
Sulfate - DL	56	F1	6.0	1.3	mg/L	10		9056A	Total/NA
Barium	37	J	200	8.6	ug/L	1		6010C	Total/NA
Calcium	36000		5000	350	ug/L	1		6010C	Total/NA
Chromium	7.6	J	10	3.3	ug/L	1		6010C	Total/NA
Iron	1300		150	92	ug/L	1		6010C	Total/NA
Magnesium	9200		5000	310	ug/L	1		6010C	Total/NA
Manganese	40		15	3.1	ug/L	1		6010C	Total/NA
Potassium	16000		5000	170	ug/L	1		6010C	Total/NA
Sodium	14000		5000	410	ug/L	1		6010C	Total/NA
Cyanide, Total	0.024		0.010	0.0020	mg/L	1		9012B	Total/NA

Client Sample ID: 0171-051617-1400 — Lab Sample ID: 460-133539-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	170	J	1000	43	ug/L	5		6010C	TCLP
pH	8.5	HF			SU	1		9045D	Total/NA
Corrosivity	8.5	HF			SU	1		9045D	Total/NA
Density	2.36		0.0100	0.0100	g/cm3	1		D854	Total/NA
Specific Gravity	2.37		0.0100	0.0100	NONE	1		D854	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 0171-051617-1330

Lab Sample ID: 460-133539-1

Date Collected: 05/16/17 13:30

Matrix: Water

Date Received: 05/17/17 09:30

Method: 9056A - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**	**F1**	1.2	0.31	mg/L			05/28/17 00:23	10
Sulfate	**56**	**F1**	6.0	1.3	mg/L			05/28/17 00:23	10

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**37**	**J**	200	8.6	ug/L		05/31/17 08:26	05/31/17 14:00	1
Calcium	**36000**		5000	350	ug/L		05/31/17 08:26	05/31/17 14:00	1
Chromium	**7.6**	**J**	10	3.3	ug/L		05/31/17 08:26	05/31/17 14:00	1
Iron	**1300**		150	92	ug/L		05/31/17 08:26	05/31/17 14:00	1
Magnesium	**9200**		5000	310	ug/L		05/31/17 08:26	05/31/17 14:00	1
Manganese	**40**		15	3.1	ug/L		05/31/17 08:26	05/31/17 14:00	1
Nickel	40	U	40	9.0	ug/L		05/31/17 08:26	05/31/17 14:00	1
Potassium	**16000**		5000	170	ug/L		05/31/17 08:26	05/31/17 14:00	1
Sodium	**14000**		5000	410	ug/L		05/31/17 08:26	05/31/17 14:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.024**		0.010	0.0020	mg/L		05/30/17 07:00	05/30/17 12:32	1

Client Sample ID: 0171-051617-1400

Lab Sample ID: 460-133539-2

Date Collected: 05/16/17 14:00

Matrix: Solid

Date Received: 05/17/17 09:30

Method: 8260B - TCLP Volatiles - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.010	U	0.010	0.0019	mg/L			05/25/17 07:31	10
2-Butanone	0.050	U	0.050	0.022	mg/L			05/25/17 07:31	10
Carbon tetrachloride	0.010	U	0.010	0.0033	mg/L			05/25/17 07:31	10
Chlorobenzene	0.010	U	0.010	0.0024	mg/L			05/25/17 07:31	10
Chloroform	0.010	U	0.010	0.0022	mg/L			05/25/17 07:31	10
1,2-Dichloroethane	0.010	U	0.010	0.0025	mg/L			05/25/17 07:31	10
1,1-Dichloroethene	0.010	U	0.010	0.0034	mg/L			05/25/17 07:31	10
Tetrachloroethene	0.010	U	0.010	0.0036	mg/L			05/25/17 07:31	10
Trichloroethene	0.010	U	0.010	0.0022	mg/L			05/25/17 07:31	10
Vinyl chloride	0.010	U	0.010	0.0020	mg/L			05/25/17 07:31	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Bromofluorobenzene	*93*		*77 - 124*		*05/25/17 07:31*	*10*
Dibromofluoromethane (Surr)	*107*		*72 - 131*		*05/25/17 07:31*	*10*
1,2-Dichloroethane-d4 (Surr)	*117*		*74 - 132*		*05/25/17 07:31*	*10*
Toluene-d8 (Surr)	*96*		*80 - 120*		*05/25/17 07:31*	*10*

Method: 8270C - TCLP Semivolatiles - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3 & 4 Methylphenol	0.010	U	0.010	0.00088	mg/L		05/19/17 10:34	05/26/17 13:28	1
Phenol	0.010	U	0.010	0.00041	mg/L		05/19/17 10:34	05/26/17 13:28	1
Pyridine	0.010	U	0.010	0.00094	mg/L		05/19/17 10:34	05/26/17 13:28	1
1,4-Dichlorobenzene	0.010	U	0.010	0.00066	mg/L		05/19/17 10:34	05/26/17 13:28	1
2-Methylphenol	0.010	U	0.010	0.0013	mg/L		05/19/17 10:34	05/26/17 13:28	1
Hexachloroethane	0.0010	U *	0.0010	0.000090	mg/L		05/19/17 10:34	05/26/17 13:28	1

Client Sample ID: 0171-051617-1400
Date Collected: 05/16/17 14:00
Date Received: 05/17/17 09:30

Lab Sample ID: 460-133539-2
Matrix: Solid

Method: 8270C - TCLP Semivolatiles - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methylphenol	0.010	U	0.010	0.00087	mg/L		05/19/17 10:34	05/26/17 13:28	1
Nitrobenzene	0.0010	U	0.0010	0.00049	mg/L		05/19/17 10:34	05/26/17 13:28	1
Hexachlorobutadiene	0.0020	U	0.0020	0.00076	mg/L		05/19/17 10:34	05/26/17 13:28	1
2,4,6-Trichlorophenol	0.010	U	0.010	0.00053	mg/L		05/19/17 10:34	05/26/17 13:28	1
2,4,5-Trichlorophenol	0.010	U	0.010	0.00049	mg/L		05/19/17 10:34	05/26/17 13:28	1
2,4-Dinitrotoluene	0.0020	U	0.0020	0.0010	mg/L		05/19/17 10:34	05/26/17 13:28	1
Hexachlorobenzene	0.0010	U	0.0010	0.00047	mg/L		05/19/17 10:34	05/26/17 13:28	1
Pentachlorophenol	0.030	U	0.030	0.0022	mg/L		05/19/17 10:34	05/26/17 13:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*100*		*51 - 108*	*05/19/17 10:34*	*05/26/17 13:28*	*1*
Phenol-d5	*23*		*14 - 39*	*05/19/17 10:34*	*05/26/17 13:28*	*1*
Terphenyl-d14	*90*		*40 - 148*	*05/19/17 10:34*	*05/26/17 13:28*	*1*
2,4,6-Tribromophenol	*96*		*26 - 139*	*05/19/17 10:34*	*05/26/17 13:28*	*1*
2-Fluorophenol	*38*		*25 - 58*	*05/19/17 10:34*	*05/26/17 13:28*	*1*
2-Fluorobiphenyl	*98*		*45 - 107*	*05/19/17 10:34*	*05/26/17 13:28*	*1*

Method: 6010C - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	50	U	50	9.0	ug/L		05/19/17 22:40	05/20/17 21:15	5
Arsenic	75	U	75	22	ug/L		05/19/17 22:40	05/20/17 21:15	5
Barium	**170**	**J**	1000	43	ug/L		05/19/17 22:40	05/20/17 21:15	5
Cadmium	20	U	20	9.2	ug/L		05/19/17 22:40	05/20/17 21:15	5
Chromium	50	U	50	17	ug/L		05/19/17 22:40	05/23/17 11:06	5
Lead	50	U	50	20	ug/L		05/19/17 22:40	05/20/17 21:15	5
Selenium	100	U	100	22	ug/L		05/19/17 22:40	05/20/17 21:15	5

Method: 7470A - TCLP Mercury - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		05/23/17 11:34	05/23/17 15:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Burn Rate	2.20	U	2.20	2.20	mm/sec			05/30/17 15:46	1
Cyanide, Total	0.10	U F2 F1	0.10	0.027	mg/Kg		05/30/17 07:00	05/30/17 12:12	1
Sulfide	8.7	U F1	8.7	3.4	mg/Kg		05/21/17 11:00	05/21/17 16:00	1
pH	**8.5**	**HF**			SU			05/30/17 13:51	1
Corrosivity	**8.5**	**HF**			SU			05/30/17 13:51	1

Method: D854 - Specific Gravity

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Density	**2.36**		0.0100	0.0100	g/cm3			05/20/17 00:00	1
Specific Gravity	**2.37**		0.0100	0.0100	NONE			05/20/17 00:00	1

Surrogate Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Method: 8260B - TCLP Volatiles

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	12DCE	TOL
Lab Sample ID	Client Sample ID	(77-124)	(72-131)	(74-132)	(80-120)
LCS 460-439167/3	Lab Control Sample	97	102	112	100
LCS 460-439597/4	Lab Control Sample	96	94	103	95
LCSD 460-439167/4	Lab Control Sample Dup	96	99	107	97
LCSD 460-439597/5	Lab Control Sample Dup	97	94	100	98
MB 460-439167/6	Method Blank	92	102	109	95
MB 460-439597/8	Method Blank	91	93	104	98

Surrogate Legend

BFB = Bromofluorobenzene
DBFM = Dibromofluoromethane (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - TCLP Volatiles

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	12DCE	TOL
Lab Sample ID	Client Sample ID	(77-124)	(72-131)	(74-132)	(80-120)
460-133539-2	0171-051617-1400	93	107	117	96
LB 460-437906/1-A	Method Blank	93	99	107	98

Surrogate Legend

BFB = Bromofluorobenzene
DBFM = Dibromofluoromethane (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270C - TCLP Semivolatiles

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		NBZ	PHL	TPH	TBP	2FP	FBP
Lab Sample ID	Client Sample ID	(51-108)	(14-39)	(40-148)	(26-139)	(25-58)	(45-107)
LCS 460-438125/2-A	Lab Control Sample	92	25	94	118	43	97
LCSD 460-438125/3-A	Lab Control Sample Dup	84	29	105	111	46	89
MB 460-438125/1-A	Method Blank	96	26	89	113	42	92

Surrogate Legend

NBZ = Nitrobenzene-d5
PHL = Phenol-d5
TPH = Terphenyl-d14
TBP = 2,4,6-Tribromophenol
2FP = 2-Fluorophenol
FBP = 2-Fluorobiphenyl

Surrogate Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Method: 8270C - TCLP Semivolatiles

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)							
		NBZ	PHL	TPH	TBP	2FP	FBP		
Lab Sample ID	Client Sample ID	(51-108)	(14-39)	(40-148)	(26-139)	(25-58)	(45-107)		
460-133539-2	0171-051617-1400	100	23	90	96	38	98		
LB 460-437940/1-B	Method Blank	101	29	98	109	48	98		

Surrogate Legend

NBZ = Nitrobenzene-d5
PHL = Phenol-d5
TPH = Terphenyl-d14
TBP = 2,4,6-Tribromophenol
2FP = 2-Fluorophenol
FBP = 2-Fluorobiphenyl

Method: 8260B - TCLP Volatiles

Lab Sample ID: MB 460-439167/6
Matrix: Solid
Analysis Batch: 439167

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0010	U	0.0010	0.00019	mg/L			05/24/17 22:45	1
2-Butanone	0.0050	U	0.0050	0.0022	mg/L			05/24/17 22:45	1
Carbon tetrachloride	0.0010	U	0.0010	0.00033	mg/L			05/24/17 22:45	1
Chlorobenzene	0.0010	U	0.0010	0.00024	mg/L			05/24/17 22:45	1
Chloroform	0.0010	U	0.0010	0.00022	mg/L			05/24/17 22:45	1
1,2-Dichloroethane	0.0010	U	0.0010	0.00025	mg/L			05/24/17 22:45	1
1,1-Dichloroethene	0.0010	U	0.0010	0.00034	mg/L			05/24/17 22:45	1
Tetrachloroethene	0.0010	U	0.0010	0.00036	mg/L			05/24/17 22:45	1
Trichloroethene	0.0010	U	0.0010	0.00022	mg/L			05/24/17 22:45	1
Vinyl chloride	0.0010	U	0.0010	0.00020	mg/L			05/24/17 22:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Bromofluorobenzene	*92*		*77 - 124*		*05/24/17 22:45*	*1*
Dibromofluoromethane (Surr)	*102*		*72 - 131*		*05/24/17 22:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*109*		*74 - 132*		*05/24/17 22:45*	*1*
Toluene-d8 (Surr)	*95*		*80 - 120*		*05/24/17 22:45*	*1*

Lab Sample ID: LCS 460-439167/3
Matrix: Solid
Analysis Batch: 439167

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0200	0.0230		mg/L		115	77 - 121
2-Butanone	0.100	0.0955		mg/L		95	64 - 120
Carbon tetrachloride	0.0200	0.0219		mg/L		110	70 - 132
Chlorobenzene	0.0200	0.0201		mg/L		100	80 - 120
Chloroform	0.0200	0.0228		mg/L		114	80 - 120
1,2-Dichloroethane	0.0200	0.0224		mg/L		112	76 - 121
1,1-Dichloroethene	0.0200	0.0228		mg/L		114	74 - 123
Tetrachloroethene	0.0200	0.0209		mg/L		104	78 - 122
Trichloroethene	0.0200	0.0191		mg/L		96	77 - 120
Vinyl chloride	0.0200	0.0225		mg/L		112	62 - 138

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Bromofluorobenzene	*97*		*77 - 124*
Dibromofluoromethane (Surr)	*102*		*72 - 131*
1,2-Dichloroethane-d4 (Surr)	*112*		*74 - 132*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCSD 460-439167/4
Matrix: Solid
Analysis Batch: 439167

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	0.0200	0.0215		mg/L		108	77 - 121	7	30
2-Butanone	0.100	0.101		mg/L		101	64 - 120	5	30
Carbon tetrachloride	0.0200	0.0218		mg/L		109	70 - 132	1	30

Method: 8260B - TCLP Volatiles (Continued)

Lab Sample ID: LCSD 460-439167/4
Matrix: Solid
Analysis Batch: 439167

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chlorobenzene			0.0200	0.0197		mg/L		98	80 - 120	2	30
Chloroform			0.0200	0.0220		mg/L		110	80 - 120	3	30
1,2-Dichloroethane			0.0200	0.0224		mg/L		112	76 - 121	0	30
1,1-Dichloroethene			0.0200	0.0215		mg/L		107	74 - 123	6	30
Tetrachloroethene			0.0200	0.0194		mg/L		97	78 - 122	7	30
Trichloroethene			0.0200	0.0186		mg/L		93	77 - 120	3	30
Vinyl chloride			0.0200	0.0202		mg/L		101	62 - 138	11	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Bromofluorobenzene	*96*		*77 - 124*
Dibromofluoromethane (Surr)	*99*		*72 - 131*
1,2-Dichloroethane-d4 (Surr)	*107*		*74 - 132*
Toluene-d8 (Surr)	*97*		*80 - 120*

Lab Sample ID: MB 460-439597/8
Matrix: Solid
Analysis Batch: 439597

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0010	U	0.0010	0.00019	mg/L			05/19/17 10:47	1
2-Butanone	0.0050	U	0.0050	0.0022	mg/L			05/19/17 10:47	1
Carbon tetrachloride	0.0010	U	0.0010	0.00033	mg/L			05/19/17 10:47	1
Chlorobenzene	0.0010	U	0.0010	0.00024	mg/L			05/19/17 10:47	1
Chloroform	0.0010	U	0.0010	0.00022	mg/L			05/19/17 10:47	1
1,2-Dichloroethane	0.0010	U	0.0010	0.00025	mg/L			05/19/17 10:47	1
1,1-Dichloroethene	0.0010	U	0.0010	0.00034	mg/L			05/19/17 10:47	1
Tetrachloroethene	0.0010	U	0.0010	0.00036	mg/L			05/19/17 10:47	1
Trichloroethene	0.0010	U	0.0010	0.00022	mg/L			05/19/17 10:47	1
Vinyl chloride	0.0010	U	0.0010	0.00020	mg/L			05/19/17 10:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Bromofluorobenzene	*91*		*77 - 124*		*05/19/17 10:47*	*1*
Dibromofluoromethane (Surr)	*93*		*72 - 131*		*05/19/17 10:47*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*74 - 132*		*05/19/17 10:47*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*05/19/17 10:47*	*1*

Lab Sample ID: LCS 460-439597/4
Matrix: Solid
Analysis Batch: 439597

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene			0.0200	0.0210		mg/L		105	77 - 121
2-Butanone			0.100	0.0807		mg/L		81	64 - 120
Carbon tetrachloride			0.0200	0.0215		mg/L		108	70 - 132
Chlorobenzene			0.0200	0.0200		mg/L		100	80 - 120
Chloroform			0.0200	0.0211		mg/L		106	80 - 120
1,2-Dichloroethane			0.0200	0.0218		mg/L		109	76 - 121
1,1-Dichloroethene			0.0200	0.0205		mg/L		103	74 - 123

Method: 8260B - TCLP Volatiles (Continued)

Lab Sample ID: LCS 460-439597/4
Matrix: Solid
Analysis Batch: 439597

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Tetrachloroethene			0.0200	0.0192		mg/L		96	78 - 122		
Trichloroethene			0.0200	0.0174		mg/L		87	77 - 120		
Vinyl chloride			0.0200	0.0241		mg/L		120	62 - 138		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Bromofluorobenzene	*96*		*77 - 124*
Dibromofluoromethane (Surr)	*94*		*72 - 131*
1,2-Dichloroethane-d4 (Surr)	*103*		*74 - 132*
Toluene-d8 (Surr)	*95*		*80 - 120*

Lab Sample ID: LCSD 460-439597/5
Matrix: Solid
Analysis Batch: 439597

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			0.0200	0.0215		mg/L		108	77 - 121	2	30
2-Butanone			0.100	0.0834		mg/L		83	64 - 120	3	30
Carbon tetrachloride			0.0200	0.0206		mg/L		103	70 - 132	5	30
Chlorobenzene			0.0200	0.0197		mg/L		99	80 - 120	2	30
Chloroform			0.0200	0.0207		mg/L		103	80 - 120	2	30
1,2-Dichloroethane			0.0200	0.0212		mg/L		106	76 - 121	2	30
1,1-Dichloroethene			0.0200	0.0198		mg/L		99	74 - 123	4	30
Tetrachloroethene			0.0200	0.0201		mg/L		101	78 - 122	5	30
Trichloroethene			0.0200	0.0182		mg/L		91	77 - 120	4	30
Vinyl chloride			0.0200	0.0252		mg/L		126	62 - 138	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Bromofluorobenzene	*97*		*77 - 124*
Dibromofluoromethane (Surr)	*94*		*72 - 131*
1,2-Dichloroethane-d4 (Surr)	*100*		*74 - 132*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: LB 460-437906/1-A
Matrix: Solid
Analysis Batch: 439597

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.010	U	0.010	0.0019	mg/L			05/19/17 11:40	10
2-Butanone	0.050	U	0.050	0.022	mg/L			05/19/17 11:40	10
Carbon tetrachloride	0.010	U	0.010	0.0033	mg/L			05/19/17 11:40	10
Chlorobenzene	0.010	U	0.010	0.0024	mg/L			05/19/17 11:40	10
Chloroform	0.010	U	0.010	0.0022	mg/L			05/19/17 11:40	10
1,2-Dichloroethane	0.010	U	0.010	0.0025	mg/L			05/19/17 11:40	10
1,1-Dichloroethene	0.010	U	0.010	0.0034	mg/L			05/19/17 11:40	10
Tetrachloroethene	0.010	U	0.010	0.0036	mg/L			05/19/17 11:40	10
Trichloroethene	0.010	U	0.010	0.0022	mg/L			05/19/17 11:40	10
Vinyl chloride	0.010	U	0.010	0.0020	mg/L			05/19/17 11:40	10

Method: 8260B - TCLP Volatiles (Continued)

Lab Sample ID: LB 460-437906/1-A
Matrix: Solid
Analysis Batch: 439597

Client Sample ID: Method Blank
Prep Type: TCLP

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Bromofluorobenzene	*93*		*77 - 124*		*05/19/17 11:40*	*10*
Dibromofluoromethane (Surr)	*99*		*72 - 131*		*05/19/17 11:40*	*10*
1,2-Dichloroethane-d4 (Surr)	*107*		*74 - 132*		*05/19/17 11:40*	*10*
Toluene-d8 (Surr)	*98*		*80 - 120*		*05/19/17 11:40*	*10*

Method: 8270C - TCLP Semivolatiles

Lab Sample ID: MB 460-438125/1-A
Matrix: Solid
Analysis Batch: 438659

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438125

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3 & 4 Methylphenol	0.010	U	0.010	0.00088	mg/L		05/19/17 10:34	05/23/17 10:33	1
Phenol	0.010	U	0.010	0.00041	mg/L		05/19/17 10:34	05/23/17 10:33	1
Pyridine	0.010	U	0.010	0.00094	mg/L		05/19/17 10:34	05/23/17 10:33	1
1,4-Dichlorobenzene	0.010	U	0.010	0.00066	mg/L		05/19/17 10:34	05/23/17 10:33	1
2-Methylphenol	0.010	U	0.010	0.0013	mg/L		05/19/17 10:34	05/23/17 10:33	1
Hexachloroethane	0.0010	U	0.0010	0.000090	mg/L		05/19/17 10:34	05/23/17 10:33	1
4-Methylphenol	0.010	U	0.010	0.00087	mg/L		05/19/17 10:34	05/23/17 10:33	1
Nitrobenzene	0.0010	U	0.0010	0.00049	mg/L		05/19/17 10:34	05/23/17 10:33	1
Hexachlorobutadiene	0.0020	U	0.0020	0.00076	mg/L		05/19/17 10:34	05/23/17 10:33	1
2,4,6-Trichlorophenol	0.010	U	0.010	0.00053	mg/L		05/19/17 10:34	05/23/17 10:33	1
2,4,5-Trichlorophenol	0.010	U	0.010	0.00049	mg/L		05/19/17 10:34	05/23/17 10:33	1
2,4-Dinitrotoluene	0.0020	U	0.0020	0.0010	mg/L		05/19/17 10:34	05/23/17 10:33	1
Hexachlorobenzene	0.0010	U	0.0010	0.00047	mg/L		05/19/17 10:34	05/23/17 10:33	1
Pentachlorophenol	0.030	U	0.030	0.0022	mg/L		05/19/17 10:34	05/23/17 10:33	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*96*		*51 - 108*	*05/19/17 10:34*	*05/23/17 10:33*	*1*
Phenol-d5	*26*		*14 - 39*	*05/19/17 10:34*	*05/23/17 10:33*	*1*
Terphenyl-d14	*89*		*40 - 148*	*05/19/17 10:34*	*05/23/17 10:33*	*1*
2,4,6-Tribromophenol	*113*		*26 - 139*	*05/19/17 10:34*	*05/23/17 10:33*	*1*
2-Fluorophenol	*42*		*25 - 58*	*05/19/17 10:34*	*05/23/17 10:33*	*1*
2-Fluorobiphenyl	*92*		*45 - 107*	*05/19/17 10:34*	*05/23/17 10:33*	*1*

Lab Sample ID: LCS 460-438125/2-A
Matrix: Solid
Analysis Batch: 438659

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438125

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenol	0.0800	0.0266		mg/L		33	16 - 43
Pyridine	0.160	0.0787		mg/L		49	16 - 70
1,4-Dichlorobenzene	0.0800	0.0730		mg/L		91	42 - 94
2-Methylphenol	0.0800	0.0470		mg/L		59	43 - 80
Hexachloroethane	0.0800	0.0760	*	mg/L		95	39 - 92
4-Methylphenol	0.0800	0.0430		mg/L		54	34 - 78
Nitrobenzene	0.0800	0.0707		mg/L		88	56 - 106

Method: 8270C - TCLP Semivolatiles (Continued)

Lab Sample ID: LCS 460-438125/2-A
Matrix: Solid
Analysis Batch: 438659

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438125

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexachlorobutadiene	0.0800	0.0770		mg/L		96	34 - 99
2,4,6-Trichlorophenol	0.0800	0.0770		mg/L		96	62 - 120
2,4,5-Trichlorophenol	0.0800	0.0753		mg/L		94	59 - 117
2,4-Dinitrotoluene	0.0800	0.0985		mg/L		123	70 - 123
Hexachlorobenzene	0.0800	0.0817		mg/L		102	63 - 125
Pentachlorophenol	0.160	0.150		mg/L		94	54 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*92*		*51 - 108*
Phenol-d5	*25*		*14 - 39*
Terphenyl-d14	*94*		*40 - 148*
2,4,6-Tribromophenol	*118*		*26 - 139*
2-Fluorophenol	*43*		*25 - 58*
2-Fluorobiphenyl	*97*		*45 - 107*

Lab Sample ID: LCSD 460-438125/3-A
Matrix: Solid
Analysis Batch: 438659

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 438125

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenol	0.0800	0.0290		mg/L		36	16 - 43	9	30
Pyridine	0.160	0.0814		mg/L		51	16 - 70	3	30
1,4-Dichlorobenzene	0.0800	0.0722		mg/L		90	42 - 94	1	30
2-Methylphenol	0.0800	0.0498		mg/L		62	43 - 80	6	30
Hexachloroethane	0.0800	0.0778	*	mg/L		97	39 - 92	2	30
4-Methylphenol	0.0800	0.0485		mg/L		61	34 - 78	12	30
Nitrobenzene	0.0800	0.0630		mg/L		79	56 - 106	12	30
Hexachlorobutadiene	0.0800	0.0718		mg/L		90	34 - 99	7	30
2,4,6-Trichlorophenol	0.0800	0.0713		mg/L		89	62 - 120	8	30
2,4,5-Trichlorophenol	0.0800	0.0730		mg/L		91	59 - 117	3	30
2,4-Dinitrotoluene	0.0800	0.0899		mg/L		112	70 - 123	9	30
Hexachlorobenzene	0.0800	0.0809		mg/L		101	63 - 125	1	30
Pentachlorophenol	0.160	0.151		mg/L		94	54 - 120	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Nitrobenzene-d5	*84*		*51 - 108*
Phenol-d5	*29*		*14 - 39*
Terphenyl-d14	*105*		*40 - 148*
2,4,6-Tribromophenol	*111*		*26 - 139*
2-Fluorophenol	*46*		*25 - 58*
2-Fluorobiphenyl	*89*		*45 - 107*

Lab Sample ID: LB 460-437940/1-B
Matrix: Solid
Analysis Batch: 438659

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438125

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3 & 4 Methylphenol	0.010	U	0.010	0.00088	mg/L		05/19/17 10:34	05/23/17 11:39	1

Method: 8270C - TCLP Semivolatiles (Continued)

Lab Sample ID: LB 460-437940/1-B
Matrix: Solid
Analysis Batch: 438659

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438125

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenol	0.010	U	0.010	0.00041	mg/L		05/19/17 10:34	05/23/17 11:39	1
Pyridine	0.010	U	0.010	0.00094	mg/L		05/19/17 10:34	05/23/17 11:39	1
1,4-Dichlorobenzene	0.010	U	0.010	0.00066	mg/L		05/19/17 10:34	05/23/17 11:39	1
2-Methylphenol	0.010	U	0.010	0.0013	mg/L		05/19/17 10:34	05/23/17 11:39	1
Hexachloroethane	0.0010	U	0.0010	0.000090	mg/L		05/19/17 10:34	05/23/17 11:39	1
4-Methylphenol	0.010	U	0.010	0.00087	mg/L		05/19/17 10:34	05/23/17 11:39	1
Nitrobenzene	0.0010	U	0.0010	0.00049	mg/L		05/19/17 10:34	05/23/17 11:39	1
Hexachlorobutadiene	0.0020	U	0.0020	0.00076	mg/L		05/19/17 10:34	05/23/17 11:39	1
2,4,6-Trichlorophenol	0.010	U	0.010	0.00053	mg/L		05/19/17 10:34	05/23/17 11:39	1
2,4,5-Trichlorophenol	0.010	U	0.010	0.00049	mg/L		05/19/17 10:34	05/23/17 11:39	1
2,4-Dinitrotoluene	0.0020	U	0.0020	0.0010	mg/L		05/19/17 10:34	05/23/17 11:39	1
Hexachlorobenzene	0.0010	U	0.0010	0.00047	mg/L		05/19/17 10:34	05/23/17 11:39	1
Pentachlorophenol	0.030	U	0.030	0.0022	mg/L		05/19/17 10:34	05/23/17 11:39	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*101*		*51 - 108*	*05/19/17 10:34*	*05/23/17 11:39*	*1*
Phenol-d5	*29*		*14 - 39*	*05/19/17 10:34*	*05/23/17 11:39*	*1*
Terphenyl-d14	*98*		*40 - 148*	*05/19/17 10:34*	*05/23/17 11:39*	*1*
2,4,6-Tribromophenol	*109*		*26 - 139*	*05/19/17 10:34*	*05/23/17 11:39*	*1*
2-Fluorophenol	*48*		*25 - 58*	*05/19/17 10:34*	*05/23/17 11:39*	*1*
2-Fluorobiphenyl	*98*		*45 - 107*	*05/19/17 10:34*	*05/23/17 11:39*	*1*

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 460-439827/3
Matrix: Water
Analysis Batch: 439827

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.12	U	0.12	0.031	mg/L			05/27/17 13:01	1
Sulfate	0.60	U	0.60	0.13	mg/L			05/27/17 13:01	1

Lab Sample ID: LCS 460-439827/5
Matrix: Water
Analysis Batch: 439827

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.50	1.48		mg/L		98	90 - 110
Sulfate	7.50	6.92		mg/L		92	90 - 110

Lab Sample ID: LCSD 460-439827/6
Matrix: Water
Analysis Batch: 439827

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1.50	1.40		mg/L		94	90 - 110	5	15
Sulfate	7.50	6.77		mg/L		90	90 - 110	2	15

Method: 9056A - Anions, Ion Chromatography - DL

Lab Sample ID: 460-133539-1 MS
Matrix: Water
Analysis Batch: 439827

Client Sample ID: 0171-051617-1330
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride - DL	27	F1	15.0	45.6	F1	mg/L		122	90 - 110
Sulfate - DL	56	F1	75.0	141	F1	mg/L		113	90 - 110

Lab Sample ID: 460-133539-1 MSD
Matrix: Water
Analysis Batch: 439827

Client Sample ID: 0171-051617-1330
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride - DL	27	F1	15.0	45.8	F1	mg/L		123	90 - 110	0	15
Sulfate - DL	56	F1	75.0	145	F1	mg/L		118	90 - 110	2	15

Lab Sample ID: 460-133539-1 DU
Matrix: Water
Analysis Batch: 439827

Client Sample ID: 0171-051617-1330
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride - DL	27	F1	26.3		mg/L		4	15
Sulfate - DL	56	F1	55.7		mg/L		1	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 460-440312/1-A
Matrix: Water
Analysis Batch: 440371

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440312

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	5000	U	5000	350	ug/L		05/31/17 08:26	05/31/17 13:32	1
Barium	200	U	200	8.6	ug/L		05/31/17 08:26	05/31/17 13:32	1
Iron	150	U	150	92	ug/L		05/31/17 08:26	05/31/17 13:32	1
Chromium	10	U	10	3.3	ug/L		05/31/17 08:26	05/31/17 13:32	1
Magnesium	5000	U	5000	310	ug/L		05/31/17 08:26	05/31/17 13:32	1
Manganese	15	U	15	3.1	ug/L		05/31/17 08:26	05/31/17 13:32	1
Nickel	40	U	40	9.0	ug/L		05/31/17 08:26	05/31/17 13:32	1
Potassium	5000	U	5000	170	ug/L		05/31/17 08:26	05/31/17 13:32	1
Sodium	5000	U	5000	410	ug/L		05/31/17 08:26	05/31/17 13:32	1

Lab Sample ID: LCS 460-440312/2-A
Matrix: Water
Analysis Batch: 440371

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440312

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	20000	20000		ug/L		100	80 - 120
Barium	2000	2080		ug/L		104	80 - 120
Iron	1000	1020		ug/L		102	80 - 120
Chromium	200	206		ug/L		103	80 - 120
Magnesium	20000	19900		ug/L		100	80 - 120
Manganese	500	522		ug/L		104	80 - 120
Nickel	500	529		ug/L		106	80 - 120
Potassium	20000	18900		ug/L		95	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 460-440312/2-A
Matrix: Water
Analysis Batch: 440371

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440312

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	20000	19400		ug/L		97	80 - 120

Method: 6010C - TCLP Metals (ICP)

Lab Sample ID: MB 460-438275/1-A
Matrix: Solid
Analysis Batch: 438310

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438275

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	10	U	10	1.8	ug/L		05/19/17 22:40	05/20/17 20:07	1
Arsenic	15	U	15	4.4	ug/L		05/19/17 22:40	05/20/17 20:07	1
Barium	200	U	200	8.6	ug/L		05/19/17 22:40	05/20/17 20:07	1
Cadmium	4.0	U	4.0	1.8	ug/L		05/19/17 22:40	05/20/17 20:07	1
Lead	10	U	10	4.1	ug/L		05/19/17 22:40	05/20/17 20:07	1
Selenium	20	U	20	4.4	ug/L		05/19/17 22:40	05/20/17 20:07	1

Lab Sample ID: MB 460-438275/1-A
Matrix: Solid
Analysis Batch: 438449

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438275

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	10	U	10	3.3	ug/L		05/19/17 22:40	05/21/17 14:48	1

Lab Sample ID: LCS 460-438275/2-A ^2
Matrix: Solid
Analysis Batch: 438310

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438275

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	500	434		ug/L		87	80 - 120
Arsenic	5000	4710		ug/L		94	80 - 120
Barium	10000	10000		ug/L		100	80 - 120
Cadmium	1000	1030		ug/L		103	80 - 120
Lead	5000	5310		ug/L		106	80 - 120
Selenium	1000	922		ug/L		92	80 - 120

Lab Sample ID: LCS 460-438275/2-A ^2
Matrix: Solid
Analysis Batch: 438449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438275

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	5000	5940		ug/L		119	80 - 120

Lab Sample ID: LB 460-437940/1-E ^5
Matrix: Solid
Analysis Batch: 438310

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438275

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	50	U	50	9.0	ug/L		05/19/17 22:40	05/20/17 21:28	5
Arsenic	75	U	75	22	ug/L		05/19/17 22:40	05/20/17 21:28	5

Method: 6010C - TCLP Metals (ICP) (Continued)

Lab Sample ID: LB 460-437940/1-E ^5
Matrix: Solid
Analysis Batch: 438310

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438275

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	1000	U	1000	43	ug/L		05/19/17 22:40	05/20/17 21:28	5
Cadmium	20	U	20	9.2	ug/L		05/19/17 22:40	05/20/17 21:28	5
Lead	50	U	50	20	ug/L		05/19/17 22:40	05/20/17 21:28	5
Selenium	100	U	100	22	ug/L		05/19/17 22:40	05/20/17 21:28	5

Lab Sample ID: LB 460-437940/1-E ^5
Matrix: Solid
Analysis Batch: 438449

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438275

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	50	U	50	17	ug/L		05/19/17 22:40	05/21/17 15:52	5

Lab Sample ID: LB 460-438149/1-B ^5
Matrix: Solid
Analysis Batch: 438310

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438275

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	50	U	50	9.0	ug/L		05/19/17 22:40	05/20/17 21:32	5
Arsenic	75	U	75	22	ug/L		05/19/17 22:40	05/20/17 21:32	5
Barium	1000	U	1000	43	ug/L		05/19/17 22:40	05/20/17 21:32	5
Cadmium	20	U	20	9.2	ug/L		05/19/17 22:40	05/20/17 21:32	5
Lead	27.3	J	50	20	ug/L		05/19/17 22:40	05/20/17 21:32	5
Selenium	100	U	100	22	ug/L		05/19/17 22:40	05/20/17 21:32	5

Lab Sample ID: LB 460-438149/1-B ^5
Matrix: Solid
Analysis Batch: 438449

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438275

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	50	U	50	17	ug/L		05/19/17 22:40	05/21/17 15:56	5

Method: 7470A - TCLP Mercury

Lab Sample ID: MB 460-438549/1-A
Matrix: Solid
Analysis Batch: 438632

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438549

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		05/22/17 10:59	05/22/17 13:56	1

Lab Sample ID: LCS 460-438549/2-A
Matrix: Solid
Analysis Batch: 438632

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438549

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.76		ug/L		95	80 - 120

Method: 7470A - TCLP Mercury (Continued)

Lab Sample ID: MB 460-438789/1-A
Matrix: Solid
Analysis Batch: 438858

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438789

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		05/23/17 11:34	05/23/17 15:07	1

Lab Sample ID: LCS 460-438789/2-A
Matrix: Solid
Analysis Batch: 438858

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438789

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.04		ug/L		101	80 - 120

Lab Sample ID: LB 460-437940/1-F
Matrix: Solid
Analysis Batch: 438632

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438549

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		05/22/17 10:59	05/22/17 14:50	1

Lab Sample ID: LB 460-438172/1-E
Matrix: Solid
Analysis Batch: 438632

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 438549

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.17	ug/L		05/22/17 10:59	05/22/17 14:52	1

Method: 9012B - Cyanide, Total andor Amenable

Lab Sample ID: MB 460-440062/1-A
Matrix: Solid
Analysis Batch: 440110

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440062

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.10	U	0.10	0.027	mg/Kg		05/30/17 07:00	05/30/17 12:08	1

Lab Sample ID: HLCS 460-440062/3-A
Matrix: Solid
Analysis Batch: 440110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440062

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	2.00	1.98		mg/Kg		99	90 - 110

Lab Sample ID: LCSSRM 460-440062/4-A ^40
Matrix: Solid
Analysis Batch: 440110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440062

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	159	92.4		mg/Kg		58.1	41.1 - 142.8

Method: 9012B - Cyanide, Total andor Amenable (Continued)

Lab Sample ID: LLCS 460-440062/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440062**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	1.00	1.05		mg/Kg		105	90 - 110

Lab Sample ID: 460-133539-2 MS — **Client Sample ID: 0171-051617-1400**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440062**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.10	U F2 F1	2.00	0.268	F1	mg/Kg		13	47 - 118

Lab Sample ID: 460-133539-2 MSD — **Client Sample ID: 0171-051617-1400**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440062**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	0.10	U F2 F1	2.00	0.0373	J F1 F2	mg/Kg		2	47 - 118	151	35

Lab Sample ID: MB 460-440072/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440072**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.010	U	0.010	0.0020	mg/L		05/30/17 07:00	05/30/17 12:26	1

Lab Sample ID: HLCS 460-440072/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440072**

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.200	0.207		mg/L		104	90 - 110

Lab Sample ID: LLCS 460-440072/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440072**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.100	0.103		mg/L		103	90 - 110

Lab Sample ID: 460-133539-1 MS — **Client Sample ID: 0171-051617-1330**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440072**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.024		0.200	0.242		mg/L		109	90 - 110

Lab Sample ID: 460-133539-1 MSD — **Client Sample ID: 0171-051617-1330**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 440110 — **Prep Batch: 440072**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	0.024		0.200	0.233		mg/L		105	90 - 110	4	10

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 460-438815/1-A
Matrix: Solid
Analysis Batch: 438817

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438815

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	8.7	U	8.7	3.4	mg/Kg		05/21/17 11:00	05/21/17 16:00	1

Lab Sample ID: LCS 460-438815/3-A
Matrix: Solid
Analysis Batch: 438817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438815

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	75.2	55.6		mg/Kg		74	70 - 130

Lab Sample ID: 460-133539-2 MS
Matrix: Solid
Analysis Batch: 438817

Client Sample ID: 0171-051617-1400
Prep Type: Total/NA
Prep Batch: 438815

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	8.7	U F1	55.6	35.4	F1	mg/Kg		64	70 - 130

Lab Sample ID: 460-133539-2 MSD
Matrix: Solid
Analysis Batch: 438817

Client Sample ID: 0171-051617-1400
Prep Type: Total/NA
Prep Batch: 438815

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	8.7	U F1	55.6	32.4	F1	mg/Kg		58	70 - 130	9	15

Method: 9045D - Corrosivity as pH

Lab Sample ID: MB 460-440139/2
Matrix: Solid
Analysis Batch: 440139

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.9				SU			05/30/17 13:47	1
Corrosivity	5.9				SU			05/30/17 13:47	1

Lab Sample ID: LCSSRM 460-440139/3
Matrix: Solid
Analysis Batch: 440139

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.50	7.5		SU		99.7	97.3 - 102.7
Corrosivity	7.50	7.5		SU		99.7	97.3 - 102.7

Method: D854 - Specific Gravity

Lab Sample ID: LCS 140-11445/3
Matrix: Solid
Analysis Batch: 11445

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Density			0.997	0.9971		g/cm3		100	99 - 101		

Lab Sample ID: 460-133539-2 DU
Matrix: Solid
Analysis Batch: 11445

Client Sample ID: 0171-051617-1400
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Density	2.36			2.397		g/cm3				1	10

Lab Sample ID: LCS 140-11481/3
Matrix: Solid
Analysis Batch: 11481

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Specific Gravity			1.00	1.000		NONE		100	99 - 101		

Lab Sample ID: 460-133539-2 DU
Matrix: Solid
Analysis Batch: 11481

Client Sample ID: 0171-051617-1400
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Gravity	2.37			2.404		NONE				1	10

GC/MS VOA

Leach Batch: 437906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	1311	
LB 460-437906/1-A	Method Blank	TCLP	Solid	1311	

Analysis Batch: 439167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	8260B	437906
MB 460-439167/6	Method Blank	Total/NA	Solid	8260B	
LCS 460-439167/3	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 460-439167/4	Lab Control Sample Dup	Total/NA	Solid	8260B	

Analysis Batch: 439597

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-437906/1-A	Method Blank	TCLP	Solid	8260B	437906
MB 460-439597/8	Method Blank	Total/NA	Solid	8260B	
LCS 460-439597/4	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 460-439597/5	Lab Control Sample Dup	Total/NA	Solid	8260B	

GC/MS Semi VOA

Leach Batch: 437940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	1311	
LB 460-437940/1-B	Method Blank	TCLP	Solid	1311	

Prep Batch: 438125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	3510C	437940
LB 460-437940/1-B	Method Blank	TCLP	Solid	3510C	437940
MB 460-438125/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 460-438125/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 460-438125/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 438659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-437940/1-B	Method Blank	TCLP	Solid	8270C	438125
MB 460-438125/1-A	Method Blank	Total/NA	Solid	8270C	438125
LCS 460-438125/2-A	Lab Control Sample	Total/NA	Solid	8270C	438125
LCSD 460-438125/3-A	Lab Control Sample Dup	Total/NA	Solid	8270C	438125

Analysis Batch: 439465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	8270C	438125

HPLC/IC

Analysis Batch: 439827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-1 - DL	0171-051617-1330	Total/NA	Water	9056A	
MB 460-439827/3	Method Blank	Total/NA	Water	9056A	
LCS 460-439827/5	Lab Control Sample	Total/NA	Water	9056A	

HPLC/IC (Continued)

Analysis Batch: 439827 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 460-439827/6	Lab Control Sample Dup	Total/NA	Water	9056A	
460-133539-1 MS - DL	0171-051617-1330	Total/NA	Water	9056A	
460-133539-1 MSD - DL	0171-051617-1330	Total/NA	Water	9056A	
460-133539-1 DU - DL	0171-051617-1330	Total/NA	Water	9056A	

Metals

Leach Batch: 437940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	1311	
LB 460-437940/1-E ^5	Method Blank	TCLP	Solid	1311	
LB 460-437940/1-F	Method Blank	TCLP	Solid	1311	

Leach Batch: 438149

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-438149/1-B ^5	Method Blank	TCLP	Solid	1311	

Leach Batch: 438172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-438172/1-E	Method Blank	TCLP	Solid	1311	

Prep Batch: 438275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	3010A	437940
LB 460-437940/1-E ^5	Method Blank	TCLP	Solid	3010A	437940
LB 460-438149/1-B ^5	Method Blank	TCLP	Solid	3010A	438149
MB 460-438275/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 460-438275/2-A ^2	Lab Control Sample	Total/NA	Solid	3010A	

Analysis Batch: 438310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	6010C	438275
LB 460-437940/1-E ^5	Method Blank	TCLP	Solid	6010C	438275
LB 460-438149/1-B ^5	Method Blank	TCLP	Solid	6010C	438275
MB 460-438275/1-A	Method Blank	Total/NA	Solid	6010C	438275
LCS 460-438275/2-A ^2	Lab Control Sample	Total/NA	Solid	6010C	438275

Analysis Batch: 438449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-437940/1-E ^5	Method Blank	TCLP	Solid	6010C	438275
LB 460-438149/1-B ^5	Method Blank	TCLP	Solid	6010C	438275
MB 460-438275/1-A	Method Blank	Total/NA	Solid	6010C	438275
LCS 460-438275/2-A ^2	Lab Control Sample	Total/NA	Solid	6010C	438275

Prep Batch: 438549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-437940/1-F	Method Blank	TCLP	Solid	7470A	437940
LB 460-438172/1-E	Method Blank	TCLP	Solid	7470A	438172
MB 460-438549/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 460-438549/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Metals (Continued)

Analysis Batch: 438632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 460-437940/1-F	Method Blank	TCLP	Solid	7470A	438549
LB 460-438172/1-E	Method Blank	TCLP	Solid	7470A	438549
MB 460-438549/1-A	Method Blank	Total/NA	Solid	7470A	438549
LCS 460-438549/2-A	Lab Control Sample	Total/NA	Solid	7470A	438549

Prep Batch: 438789

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	7470A	437940
MB 460-438789/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 460-438789/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batch: 438790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	6010C	438275

Analysis Batch: 438858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	TCLP	Solid	7470A	438789
MB 460-438789/1-A	Method Blank	Total/NA	Solid	7470A	438789
LCS 460-438789/2-A	Lab Control Sample	Total/NA	Solid	7470A	438789

Prep Batch: 440312

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-1	0171-051617-1330	Total/NA	Water	3010A	
MB 460-440312/1-A	Method Blank	Total/NA	Water	3010A	
LCS 460-440312/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 440371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-1	0171-051617-1330	Total/NA	Water	6010C	440312
MB 460-440312/1-A	Method Blank	Total/NA	Water	6010C	440312
LCS 460-440312/2-A	Lab Control Sample	Total/NA	Water	6010C	440312

General Chemistry

Prep Batch: 438815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	9030B	
MB 460-438815/1-A	Method Blank	Total/NA	Solid	9030B	
LCS 460-438815/3-A	Lab Control Sample	Total/NA	Solid	9030B	
460-133539-2 MS	0171-051617-1400	Total/NA	Solid	9030B	
460-133539-2 MSD	0171-051617-1400	Total/NA	Solid	9030B	

Analysis Batch: 438817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	9034	438815
MB 460-438815/1-A	Method Blank	Total/NA	Solid	9034	438815
LCS 460-438815/3-A	Lab Control Sample	Total/NA	Solid	9034	438815
460-133539-2 MS	0171-051617-1400	Total/NA	Solid	9034	438815
460-133539-2 MSD	0171-051617-1400	Total/NA	Solid	9034	438815

General Chemistry (Continued)

Prep Batch: 440062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	9012B	
MB 460-440062/1-A	Method Blank	Total/NA	Solid	9012B	
HLCS 460-440062/3-A	Lab Control Sample	Total/NA	Solid	9012B	
LCSSRM 460-440062/4-A ^4	Lab Control Sample	Total/NA	Solid	9012B	
LLCS 460-440062/2-A	Lab Control Sample	Total/NA	Solid	9012B	
460-133539-2 MS	0171-051617-1400	Total/NA	Solid	9012B	
460-133539-2 MSD	0171-051617-1400	Total/NA	Solid	9012B	

Prep Batch: 440072

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-1	0171-051617-1330	Total/NA	Water	9012B	
MB 460-440072/1-A	Method Blank	Total/NA	Water	9012B	
HLCS 460-440072/3-A	Lab Control Sample	Total/NA	Water	9012B	
LLCS 460-440072/2-A	Lab Control Sample	Total/NA	Water	9012B	
460-133539-1 MS	0171-051617-1330	Total/NA	Water	9012B	
460-133539-1 MSD	0171-051617-1330	Total/NA	Water	9012B	

Analysis Batch: 440110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-1	0171-051617-1330	Total/NA	Water	9012B	440072
460-133539-2	0171-051617-1400	Total/NA	Solid	9012B	440062
MB 460-440062/1-A	Method Blank	Total/NA	Solid	9012B	440062
MB 460-440072/1-A	Method Blank	Total/NA	Water	9012B	440072
HLCS 460-440062/3-A	Lab Control Sample	Total/NA	Solid	9012B	440062
HLCS 460-440072/3-A	Lab Control Sample	Total/NA	Water	9012B	440072
LCSSRM 460-440062/4-A ^4	Lab Control Sample	Total/NA	Solid	9012B	440062
LLCS 460-440062/2-A	Lab Control Sample	Total/NA	Solid	9012B	440062
LLCS 460-440072/2-A	Lab Control Sample	Total/NA	Water	9012B	440072
460-133539-1 MS	0171-051617-1330	Total/NA	Water	9012B	440072
460-133539-1 MSD	0171-051617-1330	Total/NA	Water	9012B	440072
460-133539-2 MS	0171-051617-1400	Total/NA	Solid	9012B	440062
460-133539-2 MSD	0171-051617-1400	Total/NA	Solid	9012B	440062

Analysis Batch: 440132

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	1030	

Analysis Batch: 440139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	9045D	
MB 460-440139/2	Method Blank	Total/NA	Solid	9045D	
LCSSRM 460-440139/3	Lab Control Sample	Total/NA	Solid	9045D	

Geotechnical

Analysis Batch: 11445

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	D854	
LCS 140-11445/3	Lab Control Sample	Total/NA	Solid	D854	
460-133539-2 DU	0171-051617-1400	Total/NA	Solid	D854	

Geotechnical (Continued)

Analysis Batch: 11481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-133539-2	0171-051617-1400	Total/NA	Solid	D854	
LCS 140-11481/3	Lab Control Sample	Total/NA	Solid	D854	
460-133539-2 DU	0171-051617-1400	Total/NA	Solid	D854	

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Client Sample ID: 0171-051617-1330

Lab Sample ID: 460-133539-1

Date Collected: 05/16/17 13:30

Matrix: Water

Date Received: 05/17/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A	DL	10	439827	05/28/17 00:23	HXM	TAL EDI
Total/NA	Prep	3010A			440312	05/31/17 08:26	QZY	TAL EDI
Total/NA	Analysis	6010C		1	440371	05/31/17 14:00	CDC	TAL EDI
Total/NA	Prep	9012B			440072	05/30/17 07:00	IAA	TAL EDI
Total/NA	Analysis	9012B		1	440110	05/30/17 12:32	HTV	TAL EDI

Client Sample ID: 0171-051617-1400

Lab Sample ID: 460-133539-2

Date Collected: 05/16/17 14:00

Matrix: Solid

Date Received: 05/17/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			437906	05/18/17 13:27	JNP	TAL EDI
TCLP	Analysis	8260B		10	439167	05/25/17 07:31	EMM	TAL EDI
TCLP	Leach	1311			437940	05/18/17 17:10	YXG	TAL EDI
TCLP	Prep	3510C			438125	05/19/17 10:34	GRB	TAL EDI
TCLP	Analysis	8270C		1	439465	05/26/17 13:28	CBB	TAL EDI
TCLP	Leach	1311			437940	05/18/17 17:10	YXG	TAL EDI
TCLP	Prep	3010A			438275	05/19/17 22:40	GAE	TAL EDI
TCLP	Analysis	6010C		5	438310	05/20/17 21:15	CDC	TAL EDI
TCLP	Leach	1311			437940	05/18/17 17:10	YXG	TAL EDI
TCLP	Prep	3010A			438275	05/19/17 22:40	GAE	TAL EDI
TCLP	Analysis	6010C		5	438790	05/23/17 11:06	CDC	TAL EDI
TCLP	Leach	1311			437940	05/18/17 17:10	YXG	TAL EDI
TCLP	Prep	7470A			438789	05/23/17 11:34	RBS	TAL EDI
TCLP	Analysis	7470A		1	438858	05/23/17 15:57	RBS	TAL EDI
Total/NA	Analysis	1030		1	440132	05/30/17 15:46	YAH	TAL EDI
Total/NA	Prep	9012B			440062	05/30/17 07:00	IAA	TAL EDI
Total/NA	Analysis	9012B		1	440110	05/30/17 12:12	HTV	TAL EDI
Total/NA	Prep	9030B			438815	05/21/17 11:00	HTV	TAL EDI
Total/NA	Analysis	9034		1	438817	05/21/17 16:00	HTV	TAL EDI
Total/NA	Analysis	9045D		1	440139	05/30/17 13:51	YAH	TAL EDI
Total/NA	Analysis	D854		1	11445	05/20/17 00:00	MDR	TAL KNX
Total/NA	Analysis	D854		1	11481	05/20/17 00:00	MDR	TAL KNX

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Laboratory: TestAmerica Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-18
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-17
New Jersey	NELAP	2	12028	06-30-17
New York	NELAP	2	11452	04-01-18
Pennsylvania	NELAP	3	68-00522	02-28-18
Rhode Island	State Program	1	LAO00132	12-30-17
USDA	Federal		NJCA-003-08	04-04-17 *

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
Arkansas DEQ	State Program	6	88-0688	06-16-17
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-18
Connecticut	State Program	1	PH-0223	09-30-17
Florida	NELAP	4	E87177	06-30-17
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-18
Kansas	NELAP	7	E-10349	10-31-17
Kentucky (DW)	State Program	4	90101	12-31-17
L-A-B	DoD ELAP		L2311	02-13-19
Louisiana	NELAP	6	83979	06-30-17
Louisiana (DW)	NELAP	6	LA160005	12-31-17
Maryland	State Program	3	277	03-31-18
Michigan	State Program	5	9933	04-13-17 *
Nevada	State Program	9	TN00009	07-31-17
New Jersey	NELAP	2	TN001	06-30-17
New York	NELAP	2	10781	03-31-18
North Carolina (DW)	State Program	4	21705	07-31-17
North Carolina (WW/SW)	State Program	4	64	12-31-17
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-17
Pennsylvania	NELAP	3	68-00576	12-31-17
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-17
USDA	Federal		P330-13-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-17
Virginia	NELAP	3	460176	09-14-17
Washington	State Program	10	C593	01-19-18
West Virginia (DW)	State Program	3	9955C	12-31-17
West Virginia DEP	State Program	3	345	04-30-18
Wisconsin	State Program	5	998044300	08-31-17

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Method	Method Description	Protocol	Laboratory
8260B	TCLP Volatiles	SW846	TAL EDI
8270C	TCLP Semivolatiles	SW846	TAL EDI
9056A	Anions, Ion Chromatography	SW846	TAL EDI
6010C	Metals (ICP)	SW846	TAL EDI
6010C	TCLP Metals (ICP)	SW846	TAL EDI
7470A	TCLP Mercury	SW846	TAL EDI
1030	Ignitability, Solids	SW846	TAL EDI
9012B	Cyanide, Total andor Amenable	SW846	TAL EDI
9034	Sulfide, Acid Soluble and Insoluble (Titrimetric)	SW846	TAL EDI
9045D	Corrosivity as pH	SW846	TAL EDI
D854	Specific Gravity	ASTM	TAL KNX

Protocol References:

ASTM = ASTM International

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Racer - Elyria, Ohio

TestAmerica Job ID: 460-133539-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
460-133539-1	0171-051617-1330	Water	05/16/17 13:30	05/17/17 09:30
460-133539-2	0171-051617-1400	Solid	05/16/17 14:00	05/17/17 09:30

TestAmerica Canton
4101 Shuffel Street, N. N.
North Canton, OH 44720
Phone: 330.497.9396 Fax: 330.497.0772

2.8/C25

Chain of Custody Record

162271

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: B. Aragona	Site Contact: T. Correll	Date: 5/16/17	COC No:
Company Name: Haley & Aldrich	Tel/Fax: 734-887-8490	Lab Contact: D. Pohl	Carrier: Fed Ex	___ of ___ COCs
Address: 6500 Rockside Rd Suite 220	Analysis Turnaround Time			Sampler:
City/State/Zip: Independence, OH 44131	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 216-706-1300	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: RACER	☐ 1 week			
Site: Elyria	☐ 2 days			Job / SDG No.:
PO # 179862-002	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TCLP VOCs	TCLP SVOCs	TCLP metals	Corrosivity	Reactivity	Cn	Sulfide	Sat. Paste	total Metals 6010	Sample Specific Notes:
0171-051617-1330	5/16/17	1330	G	AG		N	N									X	Final Rinsate
0171-051617-1400	↓	1400	G	SO		N	N	X	X	X	X	X	X	X	X	X	Solid Waste

460-133539 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments: Sample 0171-051617-1400 (No Total Metals) 1.5°C DR8 JPSD 5/18/17

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: 10 CS | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Fed Ex	5/16/17 2000		TA	5.17.17 930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	TAC	5/17/17 1600	via FedEx	JPSD	5/18/17 0915
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 460-133539**
Canton Facility

Client H+A Site Name _____ Cooler unpacked by:

Cooler Received on 5.17.17 Opened on 5.17.17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.3** °C) Observed Cooler Temp. 2.8 °C Corrected Cooler Temp. 2.5 °C
   IR GUN #36 (CF **+0.8**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC697954**
12. Were VOAs on the COC? Yes No
13. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes No
15. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
\\tacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-042717 Cooler Receipt Form.doc djl

TestAmerica Edison
Receipt Temperature and pH Log

Job Number: 460-133539

Number of Coolers: 1 IR Gun # 8

Cooler Temperatures

	RAW	CORRECTED		RAW	CORRECTED		RAW	CORRECTED
Cooler #1:	1.5 °C	1.5 °C	Cooler #4:	°C	°C	Cooler #7:	°C	°C
Cooler #2:	°C	°C	Cooler #5:	°C	°C	Cooler #8:	°C	°C
Cooler #3:	°C	°C	Cooler #6:	°C	°C	Cooler #9:	°C	°C

TALS Sample Number	Ammonia (pH<2)	COD (pH<2)	Nitrate Nitrite (pH<2)	Metals* (pH<2)	Hardness (pH<2)	Pest (pH 5-9)	EPH or QAM (pH<2)	Phenols (pH<2)	Sulfide (pH>9)	TKN (pH<2)	TOC (pH<2)	Total Cyanide (pH>12)	Total Phos (pH<2)	Other	Other

If pH adjustments are required record the information below:

Sample No(s). adjusted: _____

Preservative Name/Conc.: _____ Volume of Preservative used (ml): _____

Lot # of Preservative(s): _____ Expiration Date: _____

The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.

** Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.*

Initials: CA Date: 5/18/17

TestAmerica Canton
4101 Shuffel Street, N. H.
North Canton, OH 44720
Phone: 330.497.9396 Fax: 330.497.0772

2.8/C2.5

Chain of Custody Record

162271

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: B. Aragona	Site Contact: T. Correll	Date: 5/16/17	COC No:
Company Name: Haley & Aldrich	Tel/Fax: 734-887-8490	Lab Contact: D. Pohl	Carrier: Fed Ex	1 of 1 COCs
Address: 6500 Rockside Rd Suite 220	Analysis Turnaround Time			Sampler:
City/State/Zip: Independence, OH 44131	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 216-706-1300	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day			Lab Sampling:
Project Name: RACER				Job / SDG No.:
Site: Elyria				
PO # 179862-002				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TCLP VOCs	TCLP SVOCs	TCLP metals	Corrosivity	Reactivity	Cn, Sulfide	Sep. Gravity	total Metals 6010	Sample Specific Notes:
0171-051617-1330	5/16/17	1330	G	AG		N	N								X	Final Rinseate
0171-051617-1400	↓	1400	G	SO		N	N	X	X	X	X	X	X	X	~~X~~	Solids, Tanks

460-133539 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Sample 0171-051617-1400 (No Total Metals)

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
T. Correll	H&A Fed Ex	5/16/17 2000		TA	5.17.17 930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 440-133539**
Canton Facility

Client H+A Site Name _____ Cooler unpacked by:

Cooler Received on 5.17.17 Opened on 5.17.17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.3** °C) Observed Cooler Temp. 2.9 °C Corrected Cooler Temp. 2.5 °C
   IR GUN #36 (CF **+0.8**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC697954**
12. Were VOAs on the COC? Yes No
13. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes No
15. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
\\tacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-042717 Cooler Receipt Form.doc djl

TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Pohl, Denise	Carrier Tracking No(s):	COC No: 460-48434.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: denise.pohl@testamericainc.com	State of Origin: Ohio	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 460-133539-1
Address: 5815 Middlebrook Pike, ,	Due Date Requested: 5/30/2017			
City: Knoxville	TAT Requested (days):			
State, Zip: TN, 37921				
Phone: 865-291-3000(Tel) 865-584-4315(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer - Elyria, Ohio	Project #: 46020356			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D854/ Specific Gravity	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
0171-051617-1400 (460-133539-2)	5/16/17	14:00 Eastern		Solid			X	1	

NO CUSTODY SEALS
RECEIVED AT AT 0.1/ CT 0.1°C
BKD 5-18-17.
1 COOLER FEDEX # 725972866951

460-133539 Chain of Custody

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	5-17-17 1400	L40		5-18-17 09:30	TA KNOX
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/1/2017

Loc: 460
133539

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Log In Number:

Review Items	Yes	No	NA	If No, what was the problem?
1. Are the shipping containers intact?	/			☐ **Containers, Broken**
2. Were ambient air containers received intact?			/	☐ Checked in lab
3. The coolers/containers custody seal if present, is it intact?			/	☐ Yes ☐ NA
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID :_____ Correction factor: _____			/	☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel** ☐ **Cooler Out of Temp, Same Day Receipt**
5. Were all of the sample containers received intact?	/			☐ **Containers, Broken**
6. Were samples received in appropriate containers?	/			☐ **Containers, Improper; Client Contacted; Proceed/Cancel**
7. Do sample container labels match COC? (IDs, Dates, Times)	/			☐ **COC & Samples Do Not Match** ☐ **COC Incorrect/Incomplete** ☐ **COC Not Received**
8. Were all of the samples listed on the COC received?	/			☐ **Sample Received, Not on COC** ☐ **Sample on COC, Not Received**
9. Is the date/time of sample collection noted?	/			☐ **COC; No Date/Time; Client Contacted**
10. Was the sampler identified on the COC?			/	☐ **Sampler Not Listed on COC**
11. Is the client and project name/# identified?	/			☐ **COC Incorrect/Incomplete**
12. Are tests/parameters listed for each sample?	/			☐ **COC No tests on COC**
13. Is the matrix of the samples noted?	/			☐ **COC Incorrect/Incomplete**
14. Was COC relinquished? (Signed/Dated/Timed)	/			☐ **COC Incorrect/Incomplete**
15. Were samples received within holding time?	/			☐ **Holding Time - Receipt**
16. Were samples received with correct chemical preservative (excluding Encore)?			/	☐ **pH Adjusted, pH Included (See box 16A)** ☐ **Incorrect Preservative**
17. Were VOA samples received without headspace?			/	☐ **Headspace (VOA only)**
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:_____			/	☐ **Residual Chlorine**
19. For 1613B water samples is pH<9?			/	☐ If no, lab will adjust
20. For rad samples was sample activity info. Provided?			/	☐ Project missing info

Comments/Actions Taken

Labeling Verified by: **Date:**

pH test strip lot number:

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: _____ PM Instructions: _____

Sample Receiving Associate: _____ Date: 5/18/17

QA026R30.doc, 080916

APPENDIX C

Waste Manifests

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: OHD004201091
2. Page 1 of: 1
3. Emergency Response Phone: (937) 620-8524
4. Manifest Tracking Number: 008689352 FLE

GENERATOR

5. Generator's Name and Mailing Address
RACER TRUST
1400 LOWELL ST
ELYRIA OH 44035
Generator's Phone: (419) 499-1339

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: VICKERY TRANSPORTATION, INC.
U.S. EPA ID Number: OHR000103762

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
VICKERY ENVIRONMENTAL, INC.
3956 STATE ROUTE 412
VICKERY OH 43464
Facility's Phone: (419) 547-7791
U.S. EPA ID Number: OHD020273819

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3082, WASTE HAZARDOUS WASTE, LIQUID, N.O.S., 9,III,(F006)	001	TT	143 lbs	G	F006
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
WASTE PROFILE #OHB94433 EMERGENCY RESPONSE CONTACT:
ERG #171
TRIP #: 307775 TAG #: 18204161

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Tony Morrell
Signature: [signature] Agent for RACER Trust
Month: 05 Day: 16 Year: 17

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name
Signature
Month: 05 Day: 16 Year: 17

Transporter 2 Printed/Typed Name
Signature
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H134			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name
Signature
Month: Day: Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
OHD004201091	1	(937) 620-8524	008689352 FLE

GENERATOR

5. Generator's Name and Mailing Address
RACER TRUST
1400 LOWELL ST
ELYRIA OH 44035
Generator's Phone: (419) 499-1339

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: VICKERY TRANSPORTATION, INC. — U.S. EPA ID Number: OHR000103762

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
VICKERY ENVIRONMENTAL, INC.
3956 STATE ROUTE 412
VICKERY OH 43464
Facility's Phone: (419) 547-7791
U.S. EPA ID Number: OHD020273819

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3082, WASTE HAZARDOUS WASTE, LIQUID, N.O.S., 9,III,(F006)	001	TT	175	G	F006
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
WASTE PROFILE #OHB94433 EMERGENCY RESPONSE CONTACT: _____
ERG #171
TRIP #: 327975 TAG #: 1860444

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Tony Correll — Signature: on behalf of RACER Trust and properties — Month 05 Day 16 Year 17

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Buel Nesbitt — Signature: Buel Nesbitt III — Month 05 Day 16 Year 17
Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Greater than 10% Spillage discrepancy 143 Actual Gals Adj by Tony Correll 5/16/17
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H134			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: MARILYN BINSACK — Signature: Marilyn Binsack — Month 05 Day 16 Year 17

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

APPENDIX D

Waste Profile

Date Printed: 05/11/17 Chemical Waste Management, Inc. Profile #

GENERATOR'S WASTE PROFILE SHEET VIC OH894759

(_) Check here if this is a Recertification LOCATION OF ORIGINAL Vickery Environmental, Inc.

A/B WASTE GENERATOR AND CUSTOMER INFORMATION

1. Generator Name: RACER TRUST
Generator USEPA ID: OHD004201091

2. Generator Address: 1400 LOWELL ST
ELYRIA OH 44035

Billing Address: (_) Same
HALEY & ALDRICH INC
70 BLANCHARD RD, SUITE 204
BURLINGTON MA 01803

3. Technical Contact/Phone: PAMELA BARNETT 973/751-8635

4. Alternate Contact/Phone: BAN ARAGONA (HALEY & ALDRICH) 617/886-7400

Billing Contact/Phone: BAN ARAGONA 617/886-7400

C. WASTE STREAM INFORMATION

1a Process Generating Waste: LEACHATE COLLECTION TANKS BEING STEAM CLEANED
1b Waste Name: (F006) LEACHATE TANK CLEANOUT SOLUTION
1c Color : VARIES
1d Strong Odor:(_);describe:
1e Physical State @ 70F: Solid(_) Liquid(X) Both(_) Gas(_) 1f Single Layer (X) Multilayer (_)
1g Free liq. range: 99 to 100% Gravity: 1.000 to 1.300 Viscosity: LOW BTU/lb: _____ to _____
1h pH: Range 5.0 to 10.0 or Not applicable (_)
1i Liquid Flash Point: < 73F (_) 73-99F (_) 100-139F (_) 140-199F (_) >= 200F (X) N.A. (_) Closed Cup (X) Open Cup (_)

2a Is this a USEPA hazardous waste (40 CFR Part 261)? Yes (X) No (_)
2a Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): F006
State Waste Codes:
2b Do underlying hazardous constituents (UHCs) apply (40CFR268.48)?(N)
2d Is the waste predominantly debris subject to the Alternate Debris Standards(40 CFR268.45)? (N)
2e Is the waste predominantly soil subject to the Alternate Soil Treatment Standards(40 CFR268.49)? (N)
2f Does the waste contain asbestos? (N) If yes, is waste Friable(_) Non-Friable(_) or Both(_)
2g Waste contains benzene in concentrations _ _____ ppm. NESHAP?(N)
2h Is waste remediation from a major source of Haz Air Pollutants (Site Remediation NESHAP, 40CFR 63 subpart GGGGG)?(N)
If yes, does the waste contain <500 ppmw VOHAPs at the point of determination?(_)
2i Waste contains PCBs (< >) _ _____ ppm, regulated by 40 CFR 761?(N)
Are PCBs regulated under SIRS Mega Rule (40 CFR 761,61(a)?(_)

2j CHEMICAL COMPOSITION: List ALL constituents (incl. halogenated organics) present in any concentration and forward analysis

Constituents	Range		Unit Description	
WATER	97.9 to	100	%	
METAL HYDROXIDES	0 to	0.1	%	
COMMENTS	to			
(METAL HYDROXIDE SLUDGE)	to			
LEAD	0 to	1.3	MG/L	
SODIUM CARBONATE	0 to	0.5	%	See attach2
TOTAL COMPOSITION (MUST EQUAL OR EXCEED 100%):		102.100000		

2k Is the waste: Pyrophoric (_) Water-Reactive (_) Shock Sensitive (_) Oxidizer (_) Carcinogen (_) Infectious (_)
Other _____
2l Is waste Group 1 wastewater or residual under Hazardous Organic NESHAP?(N)
2m Does the waste contain radioactive material? (N) Regulated by NRC?(_) Is radioactive waste NORM?(_)
2n Is the waste a CERCLA (40 CFR 300, Appendx B) or state mandated cleanup?(N)

3a This is a Wastewater.
3e Physical Appearance: LOW VISCOSITY, LIQUID
3f If waste subject to the land ban & meets treatment standards, check here: (_) & supply analytical results where applicable.
3g Tracking Number: _____

D. DOT Information and Shipping Volume

D1 Anticipated Annual Volume: 18000 Units: GALLONS Shipping Frequency: MONTH
D2 PACKAGING: Bulk Solid (_) Bulk Liquid (X) Drum (_) Type/Size: TANK Other SHIPS 1,500 GALLONS PER MONTH

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Signature Name and Title Date

Date Printed 05/11/17

Profile #
VIC OH894759

ATTACHMENT 2

CHEMICAL COMPOSITION: Additional constituents NOT included on page 1 of the Waste Profile

Constituents	Range	Unit Description
SODIUM GLUCONATE	0 to 0.5	%
NON-TRI CHEMICALS	0 to 1	%
ETHOXYLATED ALCOHOL	to	

APPENDIX D

Boring Logs

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

SOIL BORING LOGS

Boring Number	Interval (ft)	Description
P-1	0-3	Gray brown silty clay
	3-10	Light brown silty sand and gravel
	10-12	Weathered redish brown sandstone
	12-19	Very hard find grained greenish gray sandstone, very thin shale interbeds
	19-29	Gray shale
P-2	0-8	Brown silty clay trace sand
	8-11	Gray silty clay trace sand
	11-13.5	Gray shale sandy interbeds
	13.5-22	Sandstone, medium fine gravel, thin shale interbeds
	22-23	Gray shale, some silt
P-3	0-9	Gray brown silty clay trace sand
	9-12	Weathered shale, gray
	12-14	Gray shale
	14-19	Fine grained sandstone, light gray with shale streaks
	19-23	Gray silty shale
P-4	0-4	Silty clay - fill?
	14-13	Brown to gray brown silty clay trace sand
	13-25	Very hard greenish gray sandstone
	27-28	Red shale

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

SOIL BORING LOGS

Boring Number	Interval (ft)	Description
P-5	0-3	Brown silty clay, trace sand
	8-23	Weathered light gray sandstone
	23-29	Light gray sandstone, medium fine grain
P-6	0-10	Brown silty clay, trace sand
	10-15	Weathered light gray sandstone
	15-18.5	Weathered red shale

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

Confidential under FOIA
John Messinger
Arcadis
Jun 17, 2009 17:46

FILE NO.

CDM

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fisher Body (GM) FIELD ENG/GEO Ross Overby DATE 5/14/81
PROJECT NO. 1211 CHECKED BY Ross Overby DATE 5/14/81
BORING NO. P-1 COORDINATES
PIEZOMETER NO. P-1 DATE OF INSTALLATION 5/14/81

BOREHOLE DRILLING

DRILLING METHOD Auger/Rotary
DRILLING FLUID(S) USED:
FLUID Water FROM TO
FLUID FROM TO

TYPE OF BIT Roller/ Tricone
CASING SIZE(S) USED: None
SIZE FROM TO
SIZE FROM TO

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2" ID
PERFORATION TYPE:
SLOTS [X] HOLES [ ] SCREEN [ ]
AVERAGE SIZE OF PERFORATIONS
TOTAL PERFORATED AREA

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS 2" ID
O.D. I.D.
LENGTH OF PIPE SECTIONS
JOINING METHOD GLUE ASTM 2564

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 3'
PROTECTIVE PIPE O.D.

OTHER PROTECTION

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (Ft)		ELEVATION (Ft)	
TOP OF RISER PIPE	1.1		105.9 (749.8)	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS				
GROUT/SLURRY	TOP 0	BOTTOM 13	TOP 104.8	BOTTOM 91.8
BENTONITE	TOP 0	BOTTOM 13	TOP 104.8	BOTTOM 91.8
SAND	TOP 13	BOTTOM 14	TOP 91.8	BOTTOM 90.8
GRAVEL	TOP 14	BOTTOM 20	TOP 90.8	BOTTOM 84.8
PERFORATED SECTION	TOP 15	BOTTOM 20	TOP 89.8	BOTTOM 84.8
PIEZOMETER TIP	20		84.8	
BOTTOM OF BOREHOLE				
GWL AFTER INSTALLATION	10.5		95.4	

WAS THE HOLE FLUSHED BEFORE INSTALLATION? YES [X] NO [ ]
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES [X] NO [ ]
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES [ ] NO [X]

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CDM

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fisher Body (GM) FIELD ENG/GEO Ross Overby DATE 5/15/81
PROJECT NO. 1211 CHECKED BY Ross Overby DATE 5/15/81
BORING NO. P-2 COORDINATES _____
PIEZOMETER NO. P-2 DATE OF INSTALLATION 5/15/81

BOREHOLE DRILLING

DRILLING METHOD Rotary/Auger
DRILLING FLUID(S) USED: Water
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____

TYPE OF BIT Roller/Tricone
CASING SIZE(S) USED:
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2" ID
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS _____
TOTAL PERFORATED AREA _____

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS 2" ID
O.D. _____ I.D. _____
LENGTH OF PIPE SECTIONS _____
JOINING METHOD Glue ASTM 2564

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 3'
PROTECTIVE PIPE O.D. _____

OTHER PROTECTION _____

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	1.8		105.0 (748.90)	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS				
GROUT/SLURRY	TOP 0	BOTTOM 14	TOP 103.2	BOTTOM 89.2
BENTONITE	TOP 0	BOTTOM 14	TOP 103.2	BOTTOM 89.2
SAND	TOP 14	BOTTOM 15	TOP 89.2	BOTTOM 88.2
GRAVEL	TOP 15	BOTTOM 22	TOP 88.2	BOTTOM 81.2
PERFORATED SECTION	TOP 17	BOTTOM 22	TOP 86.2	BOTTOM 81.2
PIEZOMETER TIP	22		81.2	
BOTTOM OF BOREHOLE				
GWL AFTER INSTALLATION	4.0		101.0	

WAS THE HOLE FLUSHED BEFORE INSTALLATION? YES ☒ NO ☐
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fisher Body (GM) FIELD ENG/GEO Ross Overby DATE 5/18/81
PROJECT NO. 1211 CHECKED BY Ross Overby DATE 5/18/81
BORING NO. P-3 COORDINATES _____
PIEZOMETER NO. P-3 DATE OF INSTALLATION 5/18/81

BOREHOLE DRILLING

DRILLING METHOD Auger/Rotary
DRILLING FLUID(S) USED. Water
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____

TYPE OF BIT Roller/Tricone
CASING SIZE(S) USED:
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2" ID
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS _____
TOTAL PERFORATED AREA _____

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS 2" ID
O.D. _____ I.D. _____
LENGTH OF PIPE SECTIONS _____
JOINING METHOD Glue ASTM 2564

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 3'
PROTECTIVE PIPE O.D. _____

OTHER PROTECTION _____

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	2.0		105.4 (749.30)	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS				
GROUT/SLURRY	TOP 0	BOTTOM 12	TOP 103.4	BOTTOM 91.4
BENTONITE	TOP 0	BOTTOM 12	TOP 103.4	BOTTOM 91.4
SAND	TOP 12	BOTTOM 14	TOP 91.4	BOTTOM 89.4
GRAVEL	TOP 14	BOTTOM 18	TOP 89.4	BOTTOM 85.4
PERFORATED SECTION	TOP 13	BOTTOM 18	TOP 90.4	BOTTOM 85.4
PIEZOMETER TIP	18		85.4	
BOTTOM OF BOREHOLE				
GWL AFTER INSTALLATION	5.0		100.4	

WAS THE HOLE FLUSHED BEFORE INSTALLATION? YES ☒ NO ☐
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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PIEZOMETER INSTALLATION SHEET Abandond

PROJECT NAME Fisher Body (GM) FIELD ENG/GEO Ross Overby DATE 5/19/81
PROJECT NO. 1211 CHECKED BY Ross Overby DATE 5/19/21
BORING NO. P-4 COORDINATES _____
PIEZOMETER NO. P-4 DATE OF INSTALLATION 5/19/81

BOREHOLE DRILLING

DRILLING METHOD Auger/Rotary
DRILLING FLUID(S) USED. Water
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____

TYPE OF BIT Roller/Tricone
CASING SIZE(S) USED:
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2" ID
PEREORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS _____
TOTAL PERFORATED AREA _____

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS 2" ID
O.D. _____ I.D. _____
LENGTH OF PIPE SECTIONS _____
JOINING METHOD Glue ASTM 2564

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 3'
PROTECTIVE PIPE O.D. _____

OTHER PROTECTION _____

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	1.3		110.3 (754.2)	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS				
GROUT/SLURRY	TOP 0	BOTTOM 18	TOP 109.0	BOTTOM 91.0
BENTONITE	TOP 0	BOTTOM 18	TOP 109.0	BOTTOM 91.0
SAND	TOP 18	BOTTOM 19	TOP 91.0	BOTTOM 90.0
GRAVEL	TOP 19	BOTTOM 26	TOP 90.0	BOTTOM 83.0
PERFORATED SECTION	TOP 21	BOTTOM 26	TOP 88.0	BOTTOM 83.0
PIEZOMETER TIP	26		83.0	
BOTTOM OF BOREHOLE				
GWL AFTER INSTALLATION	7.0		103.3	

WAS THE HOLE FLUSHED BEFORE INSTALLATION? YES ☒ NO ☐
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fisher Body (GM) FIELD ENG/GEO Ross Overby DATE 7-28-81
PROJECT NO. 1211 CHECKED BY Ross Overby DATE 7-28-81
BORING NO. P-5 COORDINATES _____
PIEZOMETER NO. P-5 DATE OF INSTALLATION 7-28-81

BOREHOLE DRILLING

DRILLING METHOD Auger/Rotary TYPE OF BIT Roller/Tricone
DRILLING FLUID(S) USED. CASING SIZE(S) USED:
FLUID Water FROM _____ TO _____ SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____ SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 4" OD RISER PIPE DIAMETERS 4" OD
PERFORATION TYPE: O.D. _____ I.D. _____
SLOTS ☒ HOLES ☐ SCREEN ☐ LENGTH OF PIPE SECTIONS _____
AVERAGE SIZE OF PERFORATIONS _____ JOINING METHOD GLUE ASTM 2564
TOTAL PERFORATED AREA _____

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 3' OTHER PROTECTION _____
PROTECTIVE PIPE O.D. _____

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE	1.4		108.3 (752.2)	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS				
GROUT/SLURRY	TOP -0	BOTTOM 18	TOP 106.9	BOTTOM 90.3
BENTONITE	TOP 18	BOTTOM 21	TOP 90.3	BOTTOM 87.3
SAND	TOP 21	BOTTOM 23	TOP 87.3	BOTTOM 85.3
GRAVEL	TOP 23	BOTTOM 29	TOP 85.3	BOTTOM 79.3
PERFORATED SECTION	TOP 24	BOTTOM 29	TOP 84.3	BOTTOM 79.3
PIEZOMETER TIP	29'		79.3	
BOTTOM OF BOREHOLE				
GWL AFTER INSTALLATION	9.2'		99.1	

WAS THE HOLE FLUSHED BEFORE INSTALLATION? YES ☒ NO ☐
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fisher Body (GM) FIELD ENG/GEO. Ross Overby DATE 7-29-81
PROJECT NO. 1211 CHECKED BY Ross Overby DATE 7-29-81
BORING NO. P-6 COORDINATES _____
PIEZOMETER NO. P-6 DATE OF INSTALLATION 7-29-81

BOREHOLE DRILLING

DRILLING METHOD Auger TYPE OF BIT Auger
DRILLING FLUID(S) USED:
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____
CASING SIZE(S) USED:
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 4" OD RISER PIPE DIAMETERS 4" OD
PERFORATION TYPE: O.D. _____ I.D. _____
SLOTS [X] HOLES [ ] SCREEN [ ] LENGTH OF PIPE SECTIONS _____
AVERAGE SIZE OF PERFORATIONS _____ JOINING METHOD GLUE ASTM 2564
TOTAL PERFORATED AREA _____

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 3' OTHER PROTECTION _____
PROTECTIVE PIPE O.D. _____

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	1.5		109.9 (753.8)	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS				
GROUT/SLURRY	TOP 0	BOTTOM 7	TOP 109.9	BOTTOM 102.9
BENTONITE	TOP 7	BOTTOM 8	TOP 102.9	BOTTOM 101.9
SAND	TOP 8	BOTTOM 10	TOP 101.9	BOTTOM 99.9
GRAVEL	TOP 10	BOTTOM 15	TOP 99.9	BOTTOM 94.9
PERFORATED SECTION	TOP 10	BOTTOM 15	TOP 99.9	BOTTOM 94.9
PIEZOMETER TIP	15		94.9	
BOTTOM OF BOREHOLE				
GWL AFTER INSTALLATION	9.0		100.9	

WAS THE HOLE FLUSHED BEFORE INSTALLATION? YES [ ] NO [X]
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES [ ] NO [X]
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES [ ] NO [X]

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WESTON

GEOLOGIC DRILL LOG		PROJECT NAME AND LOCATION: GMC FISHER GUIDE, Elyria, OH.				PAGE NO. 1 of 1	HOLE NO. P-1T
START 10/26/88	FINISH 10/26/88	DRILLER BOWSER	DRILL METHOD HSA	BOREHOLE DIAMETER 6"	WELL DIAMETER 2"	TOTAL DEPTH 12.50'	
LOGGER G. KINSALL		TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED '/'			

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION SAMPLE INTERVAL	DESCRIPTION	NOTES
1	SS	18	6 6 7		5				Mottled, orange, light to dark brown, gray, stiff to hard, CLAY, some silt, some root hairs, moist	
2	SS	14	7 10 15						Mottled, orange, light brown, gray, hard, SILTY CLAY, trace medium to coarse sand, moist	
3	SS	12	11 16 38		10				Medium brown, stiff, CLAY, some silt, some weathered fine sandstone, moist	
4	SS		28 40 100/4"						Light brown, fine sandstone, moist	
									End of boring @ 12.5 feet	

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*ASTM D1586
SS = SPLIT SPOON
D = DENNISON
ST = SHELBY TUBE
C = CORE
CT = CUTTINGS
CS = CONTINUOUS SAMPLER
OT = OTHER

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WESTON

GEOLOGIC DRILL LOG		PROJECT NAME AND LOCATION GMC FISHER GUIDE, Elyria, OH.				PAGE NO. 1 of 1	HOLE NO. P-2T
START 10/26/88	FINISH 10/26/88	DRILLER BOWSER	DRILL METHOD HSA	BOREHOLE DIAMETER 6"	WELL DIAMETER 2"	TOTAL DEPTH 13.50'	
LOGGER G. KINSALL		TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED ' /			

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	NOTES
1	SS	6	4 5 6		5					Light brown, soft, plastic SILTY CLAY, trace fine sand, root hairs, moist to wet.	
2	SS	18	8 12 22							Mottled, orange, light brown, gray, stiff to hard, slightly plastic, CLAY, some silt, trace fine to medium pebbles, moist.	
3	SS		11 12 18		10					Gray, stiff, non-plastic, SILTY CLAY, a little coarse sand, moist.	
4	SS		18 29 39							A/A with small zones of sandstone and weathered sandstone, moist.	
										End of boring @ 13.5 feet	

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*ASTM D1586
SS = SPLIT SPOON ST = SHELBY TUBE
D = DENNISON C = CORE CS = CONTINUOUS SAMPLER
CT = CUTTINGS OT = OTHER

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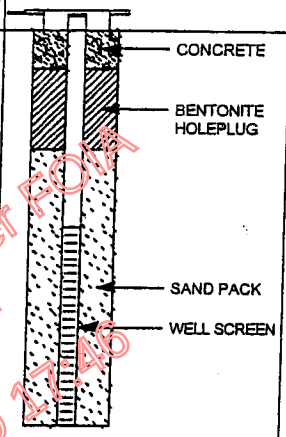
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-3T
DATE COMPLETED: May 23, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
0	CL-CLAY, silty, low plasticity, stiff, brown with orange and gray mottling, dry	
4	CL-CLAY, firm, low plasticity, light brown with orange and gray streaking, dry, gravel fragments mixed	4.00
8	CL-CLAY, stiff, compact, brown, dry, gravel fragments mixed with whitish, gray sandstone at 8' BGS	8.00
10	- Bedrock at 9.0ft BGS END OF BOREHOLE @ 10.0ft BGS	10.00

MONITOR INSTALLATION



WELL DETAILS
Screened interval: 5.00 to 10.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack: 3.00 to 10.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			12	0
2			10	0
3			12	0
4			11	0
5			69	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 12616.GPJ CRA_CORP.GDT 8/22/02

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-3R
DATE COMPLETED: June 3, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: B. WILLIAMS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
	TOPSOIL, sands, fien to medium, with vegetation	0.30
	CL-SILTY CLAY, trace fien sands, trace rootlets, trace subangular gravel, fine, compact, low plasticity, gray/brown mottling, dry to moist	
	- slight increase in fine subangular gravel content at 5.0ft BGS	
	- increase in density, dry to moist at 5.5ft BGS	
	- decrease in gray mottling, dry at 7.0ft BGS	
	- becoming darker gray, dry at 7.8ft BGS	
	SM-SILTY SANDS, medium grained, compact, gray, moist	8.75
	SANDSTONE, weathered	9.00
	END OF BOREHOLE @ 19.0ft BGS	19.00

MONITOR INSTALLATION: CONCRETE; BENTONITE CHIPS; SAND PACK; WELL SCREEN

WELL DETAILS
Screened interval:
14.00 to 19.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack
12.00 to 19.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			5	0.0
2			7	0.0
3			11	0.0
4			32	0.0
5			>100	0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 12616.GPJ CRA_CORP.GDT 8/22/02

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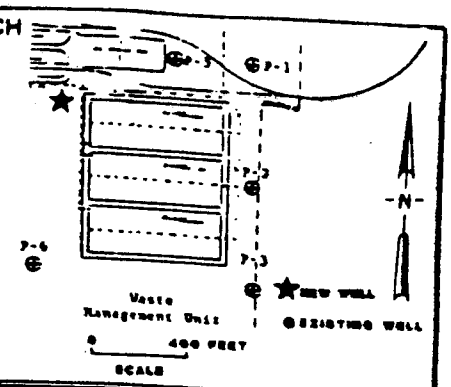
WESTON

DRILLING LOG

WELL NUMBER: W-4R
LOCATION: Near NW corner of impoundment. Wooded area
SURFACE ELEVATION: _____
DRILLING COMPANY: Bowser Morner
DRILLER: Rick Gerald
LOG BY: G. Kinsall

OWNER: GMC Fisher Guide
ADDRESS: Elyria, Ohio
TOTAL DEPTH _____
WATER LEVEL: 7'
DRILLING METHOD: HSA/Rotary
DATE DRILLED: 8/26/87
HELPER: Dave Wright

SKETCH



NOTES: Bedford Shale plugged so screen can be set in Berea Sandstone.

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		1	STP	4 8 11 15	top 4" hummus top soil (PT)
					4"-2 ft. Very stiff, brown to orange brown, SITLY CLAY, dry, trace of medium grain sand (CL)
		2		7 7 9 9	2-4 ft. Very stiff, light brown - brown, SILTY CLAY intermixed with CLAY at 2.5 ft., very wet, (MH/CH)
		3		6 9 11 15	4-6 ft. Very stiff, light brown - brown, SILTY CLAY intermixed with CLAY at 2.5 ft., very wet (MH/CH)
		4		4 8 10 15	6-8 ft. Very stiff, brown grading to medium gray, CLAY, wet, trace of orgainc material and green-gray shale fiags
		5		7 11 29 55	8-10 Hard, brownish gray-grades to gray, CLAY, mosit (CH)
10					At 9 ft contact of greenish-gray, soft, dry shale or siltstone (Orangeville)
					Berea Sandstone at 14 ft.
15					Top of Bedford Shale at 24 ft.

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Well W-4R

Well Construction Summary

Location or Coords: _____ Elevation: Ground Level _____

Top of Casing _____

Project GMC - Fisher Guide
Phase 2 Groundwater Quality Assessment

Location Elyria, Ohio

Personnel Greg Kinsall

Drilling Summary:

Total Depth 21'

Borehole Diameter 8" to 14'
4" to 21'

Driller Rick Gerald
Asst. Dave Wright

Rig Mobile 13-61

Bit(s) HSA, 3 7/8 rollar bit

Drilling Fluid Water

Surface Casing 4" Drive Casing

Well Design:

Basis: Geologic Log X Geophysical Log _____

Casing String(s): C = Casing S = Screen

21'	-	16'	S		
16'	-	+2	C_1		
-3	-	+2	C_2		

Casing: C1 #304 Sch 5 stainless Steel
2" diameter

C2 6" Protective Steel Casing

Screen: S1 #304 Sch 5 Stainless Steel
0.010" slot

S2 _____

Centralizers _____

Filter Material #4 coarse sand washed and graded 22' - 15'

Cement Portland type I 2 bags cement to 151b. bentonite

Other Bentonite slurry

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	1987			
HSA	8/26	0800	8/26	0915
Rotary Wash	8/27	0805	8/27	0930
Geophys Logging:				
Casing:				
C_1	8/27	1120	8/27	1125
C_2	8/27	1345	8/27	1355
Filter Placement:	8/27	1130	8/27	1135
Cementing:	8/27	1330	8/27	1340
Development:				
Other:				
Bentonite Pellets	8/27	1145	8/27	1155

Well Development:

First atempt to develop on 8/30/87
Well goes dry and is ledt to recharge

Comments:

Drilled into bedford shale at 24'. 2' bentonite plug is place to seal it off. 1' of sand is placed over that to set well in at 21'. Very slow recharger. Water is extreamly turbid.

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Well W-5S

Well Construction Summary

Location or Coords: _____ Elevation: Ground Level _____

Top of Casing _____

Location Elyria, Ohio
Personnel Greg Kinsall

Project Site - Parcel Outline
Phase 2 Groundwater Quality Assessment

Drilling Summary:

Total Depth 20'
Borehole Diameter 8" to 11'
4" to 20'
Driller Rick Gerald
Asst. Dave Wright

Rig Mobile 13-61
Bit(s) HSA and 3 7/8" roller bit

Drilling Fluid Water

Surface Casing 4" Drive Casing

Well Design:

Basis: Geologic Log X Geophysical Log ____

Casing String(s): C = Casing S = Screen

20'	-	15'	S		
15'	-	+2	C_1		
-3	-	+2	C_2		

Casing: C1 #304 Sch 5 Stainless Steel
2" diameter
C2 6" Protective Steel Casing

Screen: S1 #304 Sch 5 Stainless Steel
0.010" slot
S2 _____

Centralizers _____

Filter Material #4 Coarse sand washed and graded 20' to 13'

Cement Portland Type I
2 bags cement to 15lb. bentonite

Other Bentonite Pellets 13' to 10'

Construction Time Log:

Task	Start Date 1987	Start Time	Finish Date 1987	Finish Time
Drilling: HSA	8/28	0840	8/28	0920
Rotary Wash	8/28	0930	8/28	1025
Geophys. Logging:				
Casing: C_1	8/28	1030	8/28	1035
C_2	8/28	1425	8/28	1430
Filter Placement:	8/28	1040	8/28	1045
Cementing:	8/28	1410	8/28	1420
Development:				
Other:				
Bentonite Pellets	8/28	1045	8/28	1055

Well Development:

Well developed 8/30/87
5 volumes removed. Ph, cond. and temp checked after 1 vol., 3 vol., and 5 vol. stable each time

Comments:

Well is fairly good recharger.

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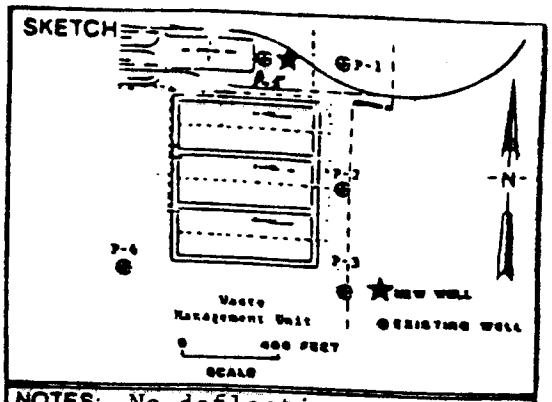
WESTON

DRILLING LOG

WELL NUMBER: W-5S
LOCATION: About 15' East of W-5
OWNER: GMC Fisher Guide
ADDRESS: Elyria, OH
TOTAL DEPTH: 20'
SURFACE ELEVATION: _____
WATER LEVEL: 8.5'
DRILLING COMPANY: Bowser MOrner
DRILLING METHOD: HSA/Rotary
DATE DRILLED: 8/28/87
DRILLER: Rick Gerald
HELPER: Dave Wright
LOG BY: Greg Kinsall

SKETCH



NOTES: No deflection on Hnu TOX and VOC taken at 10-11' intervals

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		1	SPT	push 2 2	0-2ft Soft, light brown, CLAY, dry to slightly moist, look as if material is disturbed (CL)
		2		2 2 2 2	2-4ft Soft, mottled black-green-red, CLAY, dry to moist, traces of cardboard and brick. (Still disturbed) (CL/OL)
		3		2 2 2 2	4-6ft. Soft, black, CLAY, moist. (OL)
		4		3 5 8 9	6-8ft. Stiff, mottled gray and black, CLAY, moist (CL/OL)
		5		6 10 15 20	8-10ft Very stiff, light brown, CLAY, wet, trace of sand grains, (CH)
10		6		15 38	10-11ft Very stiff to hard, light brown grading to gray, CLAY with weathered sandstone, wet (CH)
					Berea Sandstone topped at 11ft.
15					

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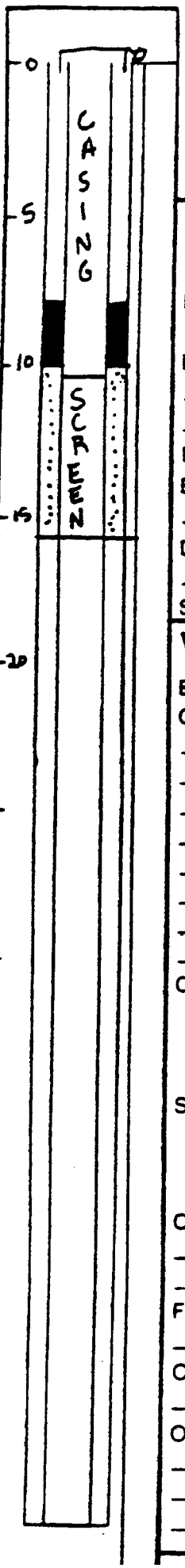
Well P6 Mw 7

Well Construction Summary

Location or Coords West of P6

Elevation Ground Level 754.35

Top of Casing 756.84



Location Elyria, Ohio
Personnel E.M.U.
Project GM

Drilling Summary:

Total Depth 16.5'
Borehole Diameter 4.25" ID
Driller Herron
Rig GME 75
Bit(s) H.S.A. 4.25" ID
Drilling Fluid Water (washed out hole)
Surface Casing Steel Protective/locked

Well Design:

Basis: Geologic Log X Geophysical Log ___

Casing String(s): C = Casing S = Screen

16	-	11	S		-
11	-	0	C		-
0	-	2	S.U.		-
	-				-
	-				-
	-				-
	-				-
	-				-

Casing C1 PVC 2"

C2

Screen: S1 PVC 2"
.010 inch slot

S2

Centralizers

Filter Material Medium sand (16 - 10')

Cement Cement/Bentonite
(8 - 0')

Other Bentonite pelle
(10 - 8')

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling X	1987 2/13	3p	1987 2/13	5p
Geophys. Logging				
Casing	2/14	9a	2/14	11:3(
Filter Placement	2/14	9a	2/14	11:3(
Cementing	2/14	9a	2/14	11:3(
Development:	2/19		2/19	
Other	2/20		2/20	

Well Development:

Well Development went slowly - pumped dry and would let well recover repeated procedure Removed 15 gallons totally, still silty

Comments:

2 bags sand
1 bucket pellets
grout 8'

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WESTON

DRILLING LOG

MW 7 P8

WELL NUMBER ~~P8~~ MW 7 P8 | OWNER GM
LOCATION West of P6 | ADDRESS Lowell St
Elyria, Ohio
TOTAL DEPTH 18.5
SURFACE ELEVATION | WATER LEVEL:
DRILLING COMPANY Herron Testing | DRILLING METHOD HSA 4.25" ID | DATE DRILLED 2/13/87
DRILLER | HELPER:
LOG BY: E.M.U.

SKETCH MAP

NOTES
Water in augers at 15'4" - 2-14-87

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		01	ss	1 2 2	SOFT, Dark brown to black silty clay, organic rich, veg. roots (clay)
		02	ss	12 5 8	STIFF, Yellowish brown, sandy silty clay, trace fine sand, some silt, trace gravel chips
5		03	ss	9 14 22	HARD
		04	ss	9 14 25	HARD, Gray clayey silt, some gravel size chips
10		05	ss	32 33 14	DENSE (14 blows - bent spoon) SS05 - top 7", white to gray fine sand, hit cobble - top of Berea Sandstone. - Lower 7", reddish to mauve silt (rods wet)
		05	ss	22 23 25	DENSE, Appears to be interbedded sandstones and shales
15		07	ss	19 22 27	HARD, Reddish to mauve, silt, contains shale chips, Bedford shale
		08	ss	18 27 28	
20					

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WESTON

GEOLOGIC DRILL LOG	PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
	GMC FISHER GUIDE, Elyria, OH.	1 of 1	P-7T

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
10/25/88	10/25/88	BOWSER	HSA	6"	2"	17.50'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
G. KINSALL			'/'

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION SAMPLE INTERVAL	DESCRIPTION	NOTES
1	SS	10	11 13 16		5				Light to medium brown, hard, non-plastic CLAYEY SILT, trace coarse sand to fine gravel, moist	
2	SS	10	10 19 29						A/A Gray, firm to hard, CLAYEY SILT, trace of coarse gravel, moist	
3	SS	8	8 27 29		10				A/A	
4	SS	8	17 37 28						Gray, fine, SILTY SAND, some pieces of sandstone, dry to moist A/A with some large (1-1.5") pieces of fine, gray sandstone, moist.	
5	SS	8	11 17 23		15				Dark brown to dark reddish brown, hard, CLAYEY SILT, starting to get shale texture, moist	
6	SS	12	11 24 44						Dark reddish brown, fissile SHALE, moist to damp	
									End of boring @ 17.5 feet	

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D = DENNISON C = CORE CS = CONTINUOUS SAMPLER
CT = CUTTINGS OT = OTHER

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WESTON

GEOLOGIC DRILL LOG	PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
	GMC FISHER GUIDE, Elyria, OH.	1 of 1	P-8T

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
10/26/88	10/26/88	BOWSER	HSA	6"	2"	10.00'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
G. KINSALL			'/'

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	NOTES
1	SS	10	3 4 5		5					Gray, slightly sticky, non-plastic CLAYEY SILT, trace of root hairs and organic material, wet.	
2	SS	8	4 6 11							Mottled light brown, orange, gray, hard, slightly plastic SILTY CLAY, a little fine sand, trace angular pebbles, moist.	
3	SS	1	100/3		10					Light brown, fine SANDSTONE, wet.	
										End of boring @ 10.0 feet	

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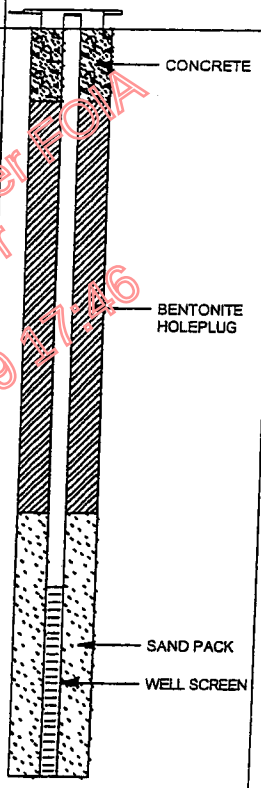
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-8R
DATE COMPLETED: May 29, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
	SILTY CLAY, dark brown, moist, roots	
2	CL-SILTY CLAY, soft, dark brown, moist, sticky	2.00
4	CL-SILTY CLAY, medium plasticity, friable, light brown, orange and gray mottling, slightly moist	4.00
6	CL-CLAY, firm, light brown, orange mottling, sticky, dry - 4" sand lense, damp at 6.5ft BGS	6.00
8	CL-CLAY, silty, very soft, friable, light brown, damp - weathered gray sandstone, damp at 9.0ft BGS	8.00
10	CL-CLAY, mixed with gray weathered sandstone, competent, light brown, wet	10.00
12		
14		
16		
18		
20	END OF BOREHOLE @ 20.0ft BGS	20.00
22		
24		
26		
28		
30		
32		
34		

MONITOR INSTALLATION



WELL DETAILS
Screened interval:
15.00 to 20.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: .010
Sand Pack:
13.00 to 20.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			7	0
2			5	0
3			8	0
4			11	0
5			46	0
6				0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 12616.GPJ CRA_CORP.GDT 9/17/02

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Well W-9

Well Construction Summary

Location or Coords: _____ Elevation: Ground Level _____

Top of Casing _____

Location Elyria, Ohio
Personnel Skip Ricketts - RFW

Project Phase 2 Groundwater Quality Assessment

Drilling Summary:

Total Depth 21'
Borehole Diameter 8" to 8.5', 4" to 15'
Driller Rich Gerald
Asst. Dave Wright
Rig 13-61 Mobile
Bit(s) 4 1/4 HSA, 3 7/8" roller bit Mill tooth
Drilling Fluid Water
Surface Casing 4" Drive Casing

Well Design:

Basis: Geologic Log ___ Geophysical Log ___

Casing String(s): C = Casing S = Screen

21'	-	16'	S		-
16'	-	+2	C_1		-
-3	-	+2	C_2		-
	-				-
	-				-
	-				-
	-				-
	-				-

Casing: C_1 #304 Sch 5 2" diameter Stainless Steel riser
C_2 6" diameter Protective Steel Casing

Screen: S_1 #304 Sch 5 2" diameter Stainless Steel.
S_2 0.010" slot

Centralizers _____

Filter Material #4 Quartz Sand - Coarse washed and graded 21'-13'

Cement Portland Type I Cement 2 bags cement with 15lb. Bentonite

Other Bentonite Pellets 13'-10'

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	1987		1987	
HSA	9/1	0850	9/1	0915
Rotary Wash	9/1	0915	9/1	1115
Geophys. Logging:				
Casing:				
C_1	9/1	1117	9/1	1120
C_2	9/1	1155	9/1	1200
Filter Placement:	9/1	1120	9/1	1125
Cementing:	9/1	1135	9/1	1150
Development:	9/2	1245	9/2	1315
Other:				
Bentonite Pellets	9/1	1125	9/1	1127

Well Development:

5 Volumes equals approximatly 10.6 gallons. Removed 11.1 gallons Water was initially clear becomming strongly turbid - reddish brown at 3 gallons removed. Continued development yielded mildly turbid light gray water at 8 gallons removed.

Comments:

Drill HSA to 8.5' at Berea Sandstone
WOB-500 PSI
Ran out of drill water at 19' - 10:40 hrs. Resume drilling at 11:05hr

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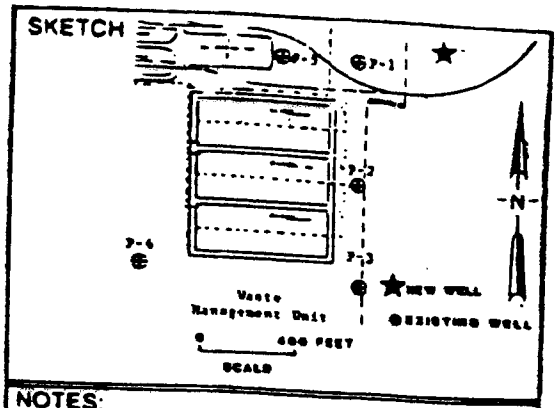
WESTON

DRILLING LOG

WELL NUMBER: W-9
LOCATION: East of P-1
OWNER: GMC Fisher Guide
ADDRESS: Elyria, OH
TOTAL DEPTH 21 ft.
SURFACE ELEVATION:
WATER LEVEL:
DRILLING COMPANY: Bowser Morner
DRILLING METHOD: HSA
DATE DRILLED: 9/1/87
DRILLER: Rick Gerald
HELPER: Dave Wright
LOG BY: Ricketts

SKETCH



NOTES:
No deflection on Hnu

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		1	SPT	3 6 9 11	0-2ft. Slightly stiff, dark brown - medium gray with orange brown mottling, organic CLAY grading to CLAY, plastic, moist, abndt. root hairs (CH/CH)
		2		8 12 12 12	2-4ft. As above, however: stiff, less moist
		3		3 6 9 13	4-6ft. Slighty stiff, orange brown mottled with gray, CLAY plastic, moist, abndt. root hairs, traces of gravel-pebbles (CH)
		4		14 21 25 43	6-8ft. Very stiff, orange brown SILTY CLAY, slightly moist, trace of pebbles (CL). Shale at 7.5ft. fissile, brittle, gray-black cleavage faces oxidised.
10		5	cut-ting		8.5ft. Sandstone, tan, occ. brown bands, fine grain, friable moist, moderately hard
		6			Drill break at 12ft. 8.5-12ft. Sandstone, tan grading to light gray, fine-med. grain, fining down to gray shaly sand Shale in sanstone probably accounts for drill break
5					12-18ft. Sandstone, light gray, very fine grain, occ. thin shale interbeds
					Berea Sandstone to 21ft. Top of bedford shale at 21ft. Black, fissile mod hard

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Well W-10

Well Construction Summary

Location or Coords: _____ Elevation: Ground Level _____

Top of Casing _____

Location Elyria, Ohio
Personnel Skip Ricketts - RFW

Phase 2 Groundwater Quality Assessment

Drilling Summary:

Total Depth 15'
Borehole Diameter 8" to 7 1/2'
4" to 15'
Driller Rick Gerald
Asst. Dave Wright
Rig Mobile 13-61
Bit(s) HSA, 3 7/8" roller bit
Drilling Fluid Water
Surface Casing 4" Drive Casing

Well Design:

Basis: Geologic Log X Geophysical Log _____
Casing String(s): C = Casing S = Screen

15	-	10	S		
10	-	+2	C_1		
-3	-	+2	C_2		

Casing: C_1 #304 Sch. 5 Stainless Steel 2" diameter
C_2 6" Protectibe Steel Casing

Screen: S1 #304 Sch 5 Stainless Steel 0.010" slot
S2 _____

Centralizers _____

Filter Material #4 coarse sand washed and graded 15 - 8'
Cement Portland Type 1 Cement 2 bags cement with 15lb. bentonite
Other Bentonite Pellets 8 - 6 1/2'

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	1987			
HSA	9/1	1545	9/1	1610
Rotary Wash	9/1	1645	9/1	1715
Geophys. Logging:				
Casing:				
C_1	9/1	1715	9/1	1725
C_2				
Filter Placement:	9/1	1725	9/1	1730
Cementing:	9/1	1745	9/1	1815
Development:	9/2	1400	9/2	1420
Other:				
Bentonite Pellets	9/1	1730	9/1	1733

Well Development:

5 volumes equals approximately 9 gallons Well dry after removing 3.5 gallons Well water was stronly turbid and red-brown colored.

Comments:

HSA drilling to 7 1/2'
Rotary wash drilling - 7 1/2 to 15'
Extremely hard drilling 7 1/2' -8½'

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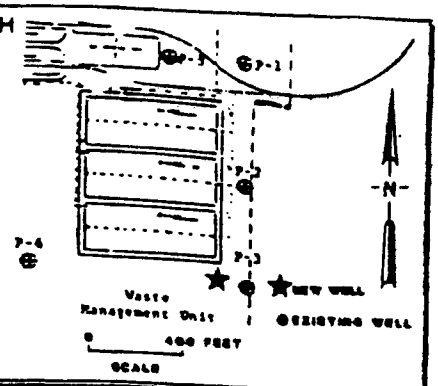
WESTON

DRILLING LOG

WELL NUMBER: W-10 OWNER: GMC Fisher Guide
LOCATION: Wooded area South of P-3 ADDRESS: Elyria, OH
TOTAL DEPTH 15'
SURFACE ELEVATION: WATER LEVEL:
DRILLING COMPANY: Bowser Morner DRILLING METHOD: HSA/Rotary DATE DRILLED: 9/1/87
DRILLER: Rick Gerald HELPER: Daves Wright
LOG BY: Ricketts

SKETCH



NOTES:
No readings on Hnu.

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		1	SPT	3 8 10 11	0-2' Firm to hard, medium gray-brown CLAY with orange mottling, abundant root hair, moist-slightly moist (OH/CH)
		2		9 13 18 21	2-4' hard, orange brown mottled with gray, CLAY, non-plastic, occ. sm shale frags and pebbles, moist to dry (CH)
		3		6 9 18 41	4-6' Hard, mottled orange brown-gray CLAY, nonplastic, abndt. shale frags and root hairs, moist to dry (CH/CL)
		4		21 40 60/3	6-7.5' No Recovery 7.0' top of Berea sandstone
10					
15					

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WESTON

GEOLOGIC DRILL LOG	PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
	GMC FISHER GUIDE, Elyria, OH.	1 of 1	P-11

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
10/27/88	10/27/88	BOWSER	HSA	6"	2"	13.00'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
G. KINSALL			'/'

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	NOTES
1	SS	24	4 6 9		5					Mottled orange, light brown and gray, stiff to hard, slightly plastic CLAY, some silt, trace fine to medium pebbles, moist.	
2	SS	24	10 19 29							A/A	
3	SS	6	100/6		10					Light orangish brown, fine grained, weathered SANDSTONE, moist.	
										End of boring @ 13.0 feet	

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CT = CUTTINGS OT = OTHER

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-01)
Page 1 of 1

PROJECT NAME: ELYRIA HYDRO INV.
PROJECT NUMBER: 12616-02
CLIENT: REALM
LOCATION: ELYRIA, OHIO

HOLE DESIGNATION: P-12
DATE COMPLETED: FEBRUARY 3, 2000
DRILLING METHOD: HSA/ TRICONE ROLLER
CRA SUPERVISOR: D. NEWTON

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft.	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	TOPSOIL, trace roots		CONCRETE	1SS		4	0.0
2.5	SC-SAND, silty, light brown clay with orange mottling, trace roots, some black organic streaking, dry			2SS		7	0.0
	CL-SILTY CLAY, low plasticity, firm, light brown with some orange mottling, dry to moist						
5.0	- some black shale pieces mixed, moist to wet		BENTONITE SLURRY	3SS		8	0.0
7.5			2"Ø PVC CASING	4SS		15	0.0
	CL-CLAY, coarse shale cobbles mixed, hard, dark brown, dry, gray shale layer at 9.3' to 9.5', then dark brown clay with trace gray shale fines		8"Ø BOREHOLE	5SS		22	0.0
10.0	CL-SILTY CLAY, plastic, light brown, moist			6SS		47	0.0
	CL-CLAY, with black shale pieces, trace gray shale fines mixed, dark brown, dry		BENTONITE CHIPS				
12.5	- shale layer at 11.5' bgs, dark brownish-gray with red mottling						
15.0	SHALE, dry, gray - weathered shale						
17.5	- orange, reddish shale		2"Ø PVC SCREEN				
20.0	- gray, weathered shale - rustic orange, reddish shaled mixed with brownish, red shale		SANDPACK				
22.5	- brown shale						
25.0	END OF HOLE @ 24.5ft BGS						
27.5							
30.0							
32.5							

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SCREEN DETAILS
Screened interval:
15.0 to 20.0ft BGS
Length: 10.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
13.0 to 23.5ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(OL-02)

PROJECT NAME: ELYRIA HYDRO INV.
PROJECT NUMBER: 12616-02
CLIENT: REALM
LOCATION: ELYRIA, OHIO

HOLE DESIGNATION: P-12T
DATE COMPLETED: FEBRUARY 3, 2000
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: D. NEWTON

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft.	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	TOPSOIL, roots, grass		CONCRETE	1SS		14	0.0
	SC-SILTY SAND, clay sand mixture, trace roots, non-plastic, light brown, dry		BENTONITE				
2.5	CL-CLAY, some silty sand, fine, brown with some gray mottling, moist		2"Ø PVC CASING	2SS		7	0.0
	- some silty, trace sand, light brown, wet		8"Ø BOREHOLE	3SS		11	0.0
5.0	- some coarse black shale pieces, pieces of gray, fine sandstone, smooth, hard, light brown with reddish, brown mottling, dry		2"Ø PVC SCREEN	4SS		22	0.0
7.5			SANDPACK				
	CL-CLAY, trace pebbles, shale chips, hard, brownish gray, rock formation at 9.1, dry to moist			5SS		58	0.0
10.0	END OF HOLE @ 9.1ft BGS						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

SCREEN DETAILS
Screened interval:
4.1 to 9.1ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
3.1 to 9.1ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-12)
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PROJECT NAME: HYDROGEOLOGIC INVESTIGATION
PROJECT NUMBER: 12618-02
CLIENT: REALM
LOCATION: ELYRIA, OHIO

HOLE DESIGNATION: P-13
DATE COMPLETED: MARCH 9, 2000
DRILLING METHOD: 4¼" HSA/AIR ROTARY
CRA SUPERVISOR: D. NEWTON

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft.	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	CH-CLAY, topsoil, plastic, brown, damp		CONCRETE	1SS		38	0.0
2.5	CL-SILTY CLAY, some shale cobbles and friable sandstone cobbles, brown, dry - very stiff, light brown with orange-gray mottling, dry		BENTONITE CHIPS	2SS		9	0.0
5.0	- moist		2"Ø PVC CASING	3SS		21	0.0
7.5			8"Ø BOREHOLE	4SS		25	0.0
10.0	SANDSTONE, coarse shale and sandstne gravels, friable, tan/gray, wet - competent sandstone			5SS		--	0.0
12.5	(collect core sample from air rotary at 9-17ft BGS)						
15.0			2"Ø PVC SCREEN SANDPACK				
17.5	END OF HOLE @ 17.0ft BGS						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

SCREEN DETAILS
Screened interval:
12 to 17ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
10 to 17ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-13)
Page 1 of 1

PROJECT NAME: HYDROGEOLOGIC INVESTIGATION
PROJECT NUMBER: 12616-02
CLIENT: REALM
LOCATION: ELYRIA, OHIO

HOLE DESIGNATION: P-13T
DATE COMPLETED: MARCH 9, 2000
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: D. NEWTON

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft.	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	CH-CLAY, topsoil, dark brown, moist		CONCRETE	1SS		33	0.0
2.5	- light brown sandstone, friable cobbles, dry		BENTONITE CHIPS	2SS		19	0.0
	- brown, wet		2"Ø PVC CASING	3SS		18	0.0
5.0	SANDSTONE, friable, tan, dry		8"Ø BOREHOLE	4SS		22	0.0
	CL-CLAY, some small sandstone fine gravels, very stiff, dark brown with gray mottling, dry		2"Ø PVC SCREEN	5SS		--	0.0
7.5			SANDPACK				
	BEDROCK, competent						
8.17	END OF HOLE @ 8.17ft BGS						
10.0			SCREEN DETAILS Screened interval: 2.5 to 8ft BGS Length: 5.0ft Diameter: 2" Slot Size: #10 Material: PVC Sand Pack: 2.5 to 8.17ft BGS Material: Sand				
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

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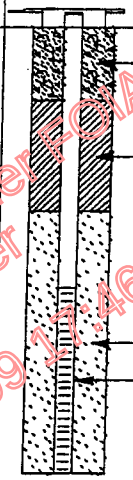
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-14T
DATE COMPLETED: May 24, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
	CL-CLAY, silty, compact, stiff, medium plasticity, friable, dark brown, dry, gravel fragments	
2	CL-CLAY, silty, firm, medium plasticity, gray clay with brown and orange streaking, gravel fragments, dry	2.00
4	CL-CLAY, medium plasticity, sticky, light brown with orange and gray mottling, slightly moist	4.00
6	CL-CLAY, silty, medium plasticity, brown, stick, gravel fragments, smooth, wet	6.00
8	CL-CLAY, silty, high plasticity, wet, sandstone (weathered), gray sandstone layer at 9.5'	8.00
10	- gray clay at 9.8ft BGS	
12	- wet, brown, silty clay mixed with gray weathered shale, sandy, hard, compact at 11.5ft BGS	12.00
	END OF BOREHOLE @ 12.0ft BGS	
14		
16		
18		
20		
22		
24		
26		
28		
30		
32		
34		



WELL DETAILS
Screened interval:
7.00 to 12.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack:
5.00 to 12.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			15	0
2			14	0
3			3	0
4			20	0
5			44	0
6			33	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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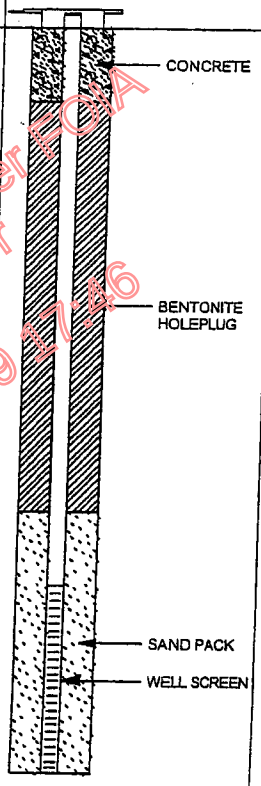
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-14
DATE COMPLETED: June 5, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
0	TOPSOIL	0.30
	CL-CLAY, poorly graded sands, light brown, moist to dry	
2	- becoming dark-brown, rootlets, silty, dry at 0.8ft BGS	
	- becoming gray with orange mottling, some broken gravel fragments, medium plasticity, silty clay, dry at 2.0ft BGS	
4	- decrease in sands at 4.0ft BGS	
6	- light brown silty clay, dry, increase in gravel pieces, dry to moist at 6.0ft BGS	
	- increase in fine grained sands, moist to wet at 7.5ft BGS	
8	- becoming hard, light brown, dry, friable at 8.5ft BGS	
10	- light brown weathered sandstone at 9.8ft BGS	
12		
	- shale layer, moist at 13.0ft BGS	13.20
14	SANDSTONE, grey, wet	
16		
18		
20	END OF BOREHOLE @ 20.0ft BGS	20.00
22		
24		
26		
28		
30		
32		
34		

MONITOR INSTALLATION



WELL DETAILS
Screened interval:
15.00 to 20.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack:
13.00 to 20.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			12	0
2			17	0
3			3	0
4			12	0
5			35	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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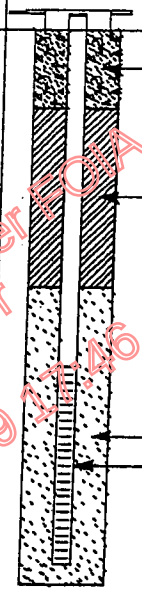
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-15T
DATE COMPLETED: May 23, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
	TOPSOIL	0.30
	CL-CLAY, silty, medium plasticity, trace roots, some gravel fragments, firm, brown, orange mottling, dry	
	- grayish silty clay, moist at 3.0ft BGS	
	- brown clay at 3.5ft BGS	
	- damp at 4.0ft BGS	
	- light brown sand lense, wet at 7.0ft BGS	
	- brown sandstone, weathered fragments at 8.0ft BGS	
	- becoming firm, brown clay, dense, dry, some sand and gravel, poorly graded, mixed sand lense, wet, fine at 8.4ft BGS	
	- becoming compact, low plasicity, dry at 10.0ft BGS	
	CL-CLAY, some graded sands, firm, silty	12.00
	- weathered gray broken sandstone, hard, gray, moist, competant bedrock at 13.0ft BGS	
	END OF BOREHOLE @ 14.0ft BGS	14.00

MONITOR INSTALLATION



WELL DETAILS
Screened interval:
8.50 to 13.50ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack:
6.50 to 14.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			9	0
2			17	0
3			8	0
4			16	0
5			53	0
6			25	0
7			32	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-15
DATE COMPLETED: May 30, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
0	SW-SAND (FILL), well graded, trace vegetation, fine to coarse sands, dark brown, moist	0.30
	SP-FILL, poorly graded medium sands, black, moist	0.40
2	CL-SILTY CLAY, trace medium sands, trace subrounded gravel, very low plasticity, compact, orange/brown mottling throughout, moist	
4	- becoming gray at 2.2ft BGS - decrease in silts, increase in fine sands at 3.0ft BGS	
6	- becoming olive gray at 3.5ft BGS - some well graded gravels, fine, subangular to rounded brown/gray mottling, brown, moist at 5.2ft BGS	
8	- decrease in gravels and sands, moist at 6.3ft BGS - orange/brown mottling, moist at 6.8ft BGS - some well graded gravels, fine, subangular to subrounded at 7.0ft BGS - becoming brown, increase in density, dense, dry at 7.4ft BGS	8.00
10		
12	CL-SILTY CLAY (NATIVE), trace subangular fine gravel, compact, low plasticity, brittle, competent, gray, dry	12.00
14	Sandstone/shale, weathered, streaked, gray, saturated	
16		
18		
20		
22	END OF BOREHOLE @ 22.0ft BGS	22.00
24		
26		
28		
30		
32		
34		

MONITOR INSTALLATION

- CONCRETE
- BENTONITE HOLEPLUG
- SAND PACK
- WELL SCREEN

WELL DETAILS
Screened interval:
17.00 to 22.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack:
15.00 to 22.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			9	0.0
2			24	0.0
3			8	0.0
4			14	0.0
5			55	0.0
6			12	0.0
7				0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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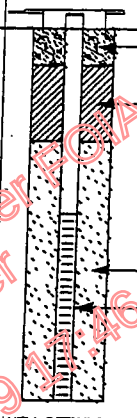
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-16T
DATE COMPLETED: May 24, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
0	TOPSOIL, trace vegetation, well graded, fill sands, moist	0.40
2	CL-CLAY, silty, stiff, medium plasticity, brown, orange mottling throughout, dry	
4	- some gravel fragments mixed, compact clay at 4.5ft BGS	
6	- slightly moist, becoming friable, some well graded sands at 6.0ft BGS	
8	- gray sandstone, weathered, broken fragments, moist at 7.0ft BGS	
10	- competent gray sandstone, wet at 9.5ft BGS	10.00
12	END OF BOREHOLE @ 10.0ft BGS	

MONITOR INSTALLATION



WELL DETAILS
Screened interval:
5.00 to 10.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack:
3.00 to 10.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			9	0
2			10	0
3			18	0
4			44	0
5			>60	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: REALM LANDFILL
PROJECT NUMBER: 12616-31
CLIENT: REALM
LOCATION: ELYRIA, OH

HOLE DESIGNATION: P-16
DATE COMPLETED: June 5, 2002
DRILLING METHOD: HSA
FIELD PERSONNEL: D. NEWTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
	TOPSOIL, some sandy fill, trace vegetation, moist	0.30
	CL-CLAY, silty, medium plasticity, stiff, brown, orange mottling, dry	
	- becoming more firm, some brown angular gravel fragments at 4.8ft BGS	
	- becoming moist, friable, more sandy, gray mottling at 6.0ft BGS	
	- weathered gray sandstone, broken fragments, poorly graded fine sands mixed, moist at 7.5ft BGS	
	SANDSTONE, competent, gray, wet	9.20
	- Bedrock fracture. Sandstone bedrock pieces mixed between coarse flakes to fine beds to large chunks from the fracture, at 14.5ft BGS	
	END OF BOREHOLE @ 18.0ft BGS	18.00

MONITOR INSTALLATION: CONCRETE; BENTONITE HOLEPLUG; SAND PACK; WELL SCREEN

WELL DETAILS
Screened interval:
13.00 to 18.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: #10
Sand Pack
11.00 to 18.00ft BGS
Material: SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
1			10	0
2			11	0
3			16	0
4			37	0
5			53	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-17
DATE COMPLETED: 26 June 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Borehole	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID
	GROUND SURFACE	752.16						
0	CL - CLAY (Till), silty, trace sand, firm, fine to coarse sand, moderate plasticity, poorly graded, medium brown, damp		Concrete	1		58	7	0.0
2	SC/CH - SAND and CLAY (Till), silty, trace fine gravel, firm to stiff, fine to coarse sand, high plasticity, slight dilatency, poorly graded, medium brown, wet	750.66		2		67	10	0.0
4			8 1/4 inch Ø Borehole	3		92	8	0.0
6	SM - SAND (Till), silty, clayey, trace fine gravel, firm, fine to coarse sand, non-plastic, slight dilatency, poorly graded, dark brown, wet	746.66	6 inch Ø PVC Casing					
	ML - SILT (Till), clayey, with sand, trace fine gravel, stiff to very stiff, fine to coarse sand, moderate plasticity, slight dilatency, poorly graded, dark brown, wet	745.66	2 inch Ø PVC Riser	4		75	10	0.0
8	- becomes gray brown, very stiff, damp		Bentonite Gravel	5		92	22	0.0
10								
12	Bedrock - Sandstone (Berea Formation),medium gray, silty, very fine sandstone, laminated to thin bedded, moderately cemented, low angle cross-bedded/laminated, dark gray to black mica flakes on laminations, numerous near-horizontal fractures (primarily mechanical), approximately 1/2 to 1 gpm water entering corehole, poor recovery	740.66	Bentonite Gravel	6		58	26	0.0
14	END OF OVERBURDEN HOLE @ 12.0ft BGS							
16								
18								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 12616 - ELYRIA.GPJ CRA_CORP.GDT 2/3/04

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-17
DATE COMPLETED: 26 June 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL
12	Bedrock - Sandstone (Berea Formation),medium gray, silty, very fine sandstone, laminated to thin bedded, moderately cemented, low angle cross-bedded/laminated, dark gray to black mica flakes on laminations, numerous near-horizontal fractures (primarily mechanical), approximately 1/2 to 1 gpm water entering corehole, poor recovery	740.66
14	Poor core recovery, fractures (primarily mechanical), spaced 1 to 1 1/2", numerous drilling and air compressor problems	737.16
16	Hole reamed out to 4 7/8" diameter to 16'2 ft BGS	
	Poor core recovery	735.99
18	Poor core recovery	733.91
20		
	Hole reamed out to 4 7/8" diameter	731.16
22	END OF BOREHOLE @ 22.7ft BGS	729.49
24	Bedrock material difficult to core. Temporary 6-inch diameter PVC casing installed, could not remove. RQD = 0 due to poor core recovery	
26		
28		

Borehole: Bentonite Gravel; 4 7/8 inch Ø Reamed Hole; Sand Pack; 2 inch Ø PVC Screen

RUN NUMBER	CORE RECOVERY %	RQD %
1	58	0
2	36	0
3	28	0
4	18	0

WELL DETAILS
Screened interval:
735.16 to 730.16ft AMSL
17.00 to 22.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 10
Material: PVC
Seal:
750.16 to 737.16ft AMSL
2.00 to 15.00ft BGS
Material: Bentonite Gravel
Sand Pack:
737.16 to 729.49ft AMSL
15.00 to 22.67ft BGS
Material: #5, #7 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

BEDROCK LOG 12616 - ELYRIA.GPJ CRA_CORP.GDT 2/3/04

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-18
DATE COMPLETED: 30 June 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID
	GROUND SURFACE	748.47						
0	CH - CLAY (Till), silty, with sand, firm to stiff, fine to coarse sand, moderate plasticity, poorly graded, medium brown to medium orange brown, moist, occasional pebble		Concrete	1		75	12	0.0
2	- sandstone cobble			2		58	13	0.0
4			8 1/4 inch Ø Borehole	3		67	9	0.0
6	- 12" of gray, silty till, wet - becomes dark brown, mottled with gray		2 inch Ø PVC Riser	4		75	24	0.0
8			6 inch Ø PVC Casing	5		75	33	0.0
10	- becomes dark gray, moist to wet, occasional sandstone fragments, coarse gravel to cobble size		Bentonite Gravel	6		33	50/4"	0.0
12	Sandstone Boulder (misidentified as bedrock) - Hole reamed out to 12.3 ft, collapsed to 11.67 ft	736.97	Bentonite Gravel					
14	CL - CLAY, silty, trace sand, trace gravel, hard, fine to coarse sand, fine gravel, low plasticity, poorly graded, dark brown, moist to wet, occasional thin sandy zones	734.97	4 7/8 inch Ø Reamed Hole	7		83	79	0.0
16				8		83	68	0.0
17	END OF OVERBURDEN HOLE @ 17.0ft BGS							
18								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-18
DATE COMPLETED: 30 June 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	RUN NUMBER	CORE RECOVERY %	RQD %
		731.47				
18	BEDROCK, shale, dark gray-green, highly weathered to clay, laminated, with fragments of less weathered shale - Collected Split Spoon from 17.5' to 18.5', (100% Recovery, N>85) - becomes dark red-brown, gradational color change - 10" shale fragements recovered by coring from 18.5 to 24 ft BGS, few fragments dark gray-green, most dark red-brown					
20				1	10"	
22						
24	- alternating thin layers of gray-green and red-brown shale, collected with Split Spoon Sampler from 24' to 24.5' (67% Recovery, N>100) - borehole reamed out, dry red-brown shale cuttings in air return		Sand Pack			
26	- red-brown shale fragments recovered by coring, hole reamed out, Split Spoon Sampler Driven from 25.5' to 26' (2" Recovery, N>100) - core 25.5 to 28 ft BGS, recover 10 inches of red-brown weathered shale fragments, to 1.5 inch long axis		2 inch Ø PVC Screen	2	10"	
28	END OF BOREHOLE @ 28.3ft BGS	720.14				
30						
32						
34						

WELL DETAILS
Screened interval:
725.30 to 720.14ft AMSL
23.17 to 28.33ft BGS
Length: 5.16ft
Diameter: 2in
Slot Size: 10
Material: PVC
Seal:
746.47 to 727.47ft AMSL
2.00 to 21.00ft BGS
Material: Bentonite Gravel
Sand Pack:
727.47 to 720.14ft AMSL
21.00 to 28.33ft BGS
Material: #5, #7 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-19
DATE COMPLETED: 27 June 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID
	GROUND SURFACE	747.59						
0	CH - CLAY (Till), silty, with sand, firm to very stiff, fine to coarse sand, moderate plasticity, poorly graded, orange brown, mottled gray, moist, occasional pebbles - near-vertical fracture, mottled gray, rootlets		Concrete	1		92	7	0.0
2				2		75	1	0.0
4			6 inch ∅ PVC Casing 8 1/4 inch ∅ Borehole	3		96	18	0.0
6	- near-vertical fracture, mottled gray, becomes trace fine gravel		2 inch ∅ PVC Riser Bentonite Gravel	4		100	31	0.0
8		739.09		5		0	>50	0.0
10	BEDROCK - Sandstone (Berea Formation), silty, very fine to fine sand, orange-brown, thin bedded, some fragments light gray - Hole reamed out to 10 ft BGS END OF OVERBURDEN HOLE @ 10.0ft BGS		Bentonite Gravel					
12								
14								
16								
18								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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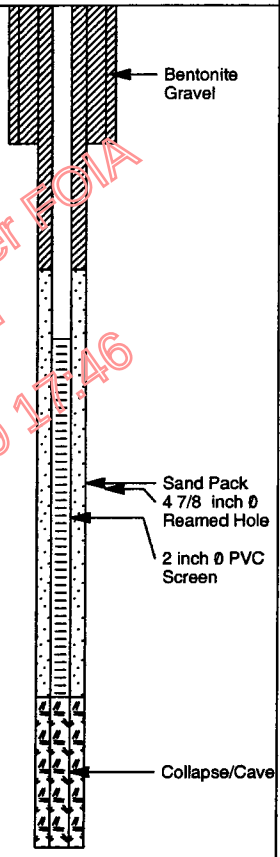
STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-19
DATE COMPLETED: 27 June 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL
	BEDROCK - Sandstone (Berea Formation), silty, very fine to fine sand, orange-brown, thin bedded, some fragments light gray	739.09
10	- Hole reamed out to 10 ft BGS	
	- becomes silty, very fine sand, medium gray no core recover from 10.5' to 15', drove very hard boulder into bedrock	
12		
14	sample collected with split Spoon Sampler from 14' to 15.5' (89% Recovery, N=134), dark gray shale, highly weathered to clay, with shale fragments, dark gray	733.59
	light gray, silty, very fine sandstone, moderately cemented	733.42
	dark gray weathered shale	733.09
	light gray, silty, very fine sandstone	732.92
	dark gray weathered shale	732.67
16	sample collected with Split Spoon Sampler from 16' to 17.5' (89% Recovery, N>140), interbedded highly weathered shale, dark gray with siltstone, medium gray-brown, and silty very fine sandstone, light gray, borehole reamed out to 17.5'	732.26
	light gray-green, silty very fine sandstone, colected with Split Spoon Sampler (17% Recovery, N>100), hole reamed out to 18' 3"	730.09
18	- Hole reamed out, collapsed to 18'	729.09
20	END OF BOREHOLE @ 20.2ft BGS	727.42
22		
24		
26		

Monitoring Well



WELL DETAILS
Screened interval:
734.76 to 729.59ft AMSL
12.83 to 18.00ft BGS
Length: 5.17ft
Diameter: 2in
Slot Size: 10
Material: PVC
Seal:
745.59 to 735.76ft AMSL
2.00 to 11.83ft BGS
Material: Bentonite Gravel
Sand Pack:
735.76 to 729.59ft AMSL
11.83 to 18.00ft BGS
Material: #5, #7 Sand

RUN NUMBER	CORE RECOVERY %	RQD %
1	3%	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-20
DATE COMPLETED: 1 July 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID
	GROUND SURFACE	745.98						
	Topsoil	745.81						
	SP - SAND, trace silt, loose, fine to coarse sand, poorly graded, medium gray brown, wet	745.48						
	CH - CLAY (Till), silty, with sand, firm to stiff, moderate plasticity, poorly graded, orange brown, mottled dark gray, moist, occasional pebble		Concrete	1		58	16	0.0
2				2		67	15	0.0
4	- becomes olive brown - 3" layer of CH - Clay, soft, dark gray green, wet		6 inch Ø PVC Casing 8 1/4 inch Ø Borehole	3		67	12	0.0
6			Bentonite Gravel 2 inch Ø PVC Riser	4		67	16	0.0
	BEDROCK - Sandstone, very fine to fine sand, light orange to gray	738.98						
8	- Hole reamed out to 9'							
10	- becomes medium gray-green sandstone, fine to coarse grained, well cemented, unfractured, cross-bedded, occasional dark gray streaks, (possibly plant material), occasional pyrite nodules 1 to 4mm END OF OVERBURDEN HOLE @ 9.0ft BGS							
12								
14								
16								
18								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-20
DATE COMPLETED: 1 July 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	RUN NUMBER	CORE RECOVERY %	RQD %
10	- becomes medium gray-green sandstone, fine to coarse grained, well cemented, unfractured, cross-bedded, occasional dark gray streaks, (possibly plant material), occasional pyrite nodules 1 to 4mm - probable fracture, orientation unknown Shale, red-brown, laminated, weathered to clay, trace silt, damp to moist, with fragments of less weathered shale	735.98	Bentonite Gravel	1	20	0
12						
14	- Collected Split Spoon Sample from 14' to 15' (100% Recovery, N>110)		Sand Pack 4 7/8 inch Ø Reamed Hole 2 inch Ø PVC Screen			
16						
18	- Collected Split Spoon Sample from 16.5' to 17.5' (100% Recovery, N>105)	727.81				
20	END OF BOREHOLE @ 18.5ft BGS					
22						
24						
26						

WELL DETAILS
Screened interval:
732.98 to 727.81ft AMSL
13.00 to 18.17ft BGS
Length: 5.17ft
Diameter: 2in
Slot Size: 10
Material: PVC
Seal:
743.98 to 734.90ft AMSL
2.00 to 11.08ft BGS
Sand Pack:
734.90 to 727.81ft AMSL
11.08 to 18.17ft BGS
Material: #5, #7 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-21
DATE COMPLETED: 2 July 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL
	GROUND SURFACE	748.40
0	CLAY (FILL), silty, with sand, trace gravel, hard, fine to coarse sand, fine gravel, moderate plasticity, poorly graded, medium brown, to medium gray-brown, damp, crumbly	
2	- Sandstone cobble	
4	CH - CLAY (TILL), silty, with sand, trace gravel, very stiff to hard, fine to coarse sand, fine gravel, moderate plasticity, poorly graded, orange brown, mottled gray, moist	744.40
6		
8	- becomes medium gray, wet	
	- Sandstone cobble	
10	SM - SAND (Till), silty, clayey, with gravel, hard, very fine to fine sand, fine to coarse gravel, slight plasticity, slight dilatency, poorly graded, dark gray, wet	738.40
12	BEDROCK - weathered sandstone, very fine to fine sand, clayey, (auger flight samples), dark gray, wet	736.40
14	END OF OVERBURDEN HOLE @ 14.0ft BGS	
16		
18		

Monitoring Well: Concrete; 8 1/4 inch Ø Borehole; 2 inch Ø PVC Riser; 6 inch Ø PVC Casing; Bentonite Gravel; Bentonite Gravel

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID
1		95	31	0.0
2		16	56	0.0
3		95	32	0.0
4		100	22	0.0
5		90	37	0.0
6		100	66	0.0
7		0	>50	NA

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: Bedrock Investigation
PROJECT NUMBER: 012616-60
CLIENT: REALM
LOCATION: Realm Landfill, Elyria, Ohio

HOLE DESIGNATION: P-21
DATE COMPLETED: 2 July 2003
DRILLING METHOD: 6¼" HSA/NX Coring/4 7/8" Reaming
FIELD PERSONNEL: Brad Trytten

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	RUN NUMBER	CORE RECOVERY %	RQD %
14	BEDROCK - weathered sandstone, very fine to fine sand, clayey, (auger flight samples), dark gray, wet	736.40	4 7/8 inch ∅ Reamed Hole			
16	- sandstone, medium gray-green, very fine to fine sand, silty, massive to laminated, cross-bedded where laminated, occasional black specks and streaks, mechanical fractures 1 1/" - 2" spacing			1	39	0
18	BEDROCK - Shale, green, weathered to clay with less weathered shale fragments, laminated, dry to damp, collected with Split Spoon Sampler from 18' to 20' (83% Recovery, N=85)	730.40	Sand Pack 2 inch ∅ PVC Screen			
20	- red-brown, near vertical fracture - Collected Split Spoon Sample from 20' to 21' (50% Recovery, N>50)					
22	END OF BOREHOLE @ 22.0ft BGS	726.40				
24						
26						
28						
30						

WELL DETAILS
Screened interval:
732.40 to 727.23ft AMSL
16.00 to 21.17ft BGS
Length: 5.17ft
Diameter: 2in
Slot Size: 10
Material: PVC
Seal:
746.40 to 733.90ft AMSL
2.00 to 14.50ft BGS
Material: Bentonite Gravel
Sand Pack:
733.90 to 726.40ft AMSL
14.50 to 22.00ft BGS
Material: #5, #7 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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APPENDIX E

Field Sampling/Logging Forms

>>> Select a Laboratory <<<

#N/A
#N/A
#N/A
#N/A

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	**Project Manager:**	**Site Contact:**	**Date:**	COC No:
Your Company Name here	**Tel/Fax:**	**Lab Contact:**	**Carrier:**	_____ of _____ COCs
Address	**Analysis Turnaround Time**			Sampler:
City/State/Zip	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(xxx) xxx-xxxx Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	**Sample Date**	**Sample Time**	**Sample Type (C=Comp, G=Grab)**	**Matrix**	**# of Cont.**	**Filtered Sample (Y / N)**	**Perform MS / MSD (Y / N)**																Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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DAILY FIELD REPORT

Page of

Project		**Report No.**	
Location		**Date**	
Client		**Page**	of
Contractor		**File No.**	
Weather		**Temperature**	

Field Representative(s)	**Time on site**	**Report/Travel/Other**	**Total hours**

Distribution:

Haley & Aldrich, Inc.

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GROUNDWATER MONITORING REPORT

OW/PZ NUMBER

Page of

PROJECT _____ H&A FILE NO. _____

LOCATION _____ PROJECT MGR. _____

CLIENT _____ FIELD REP. _____

CONTRACTOR _____ DATE _____

ELEVATION OF REFERENCE POINT _____ REFERENCE POINT: Ground Surface ☐ PVC ☐ Other ☐

Date	Time	Elapsed Time (days)	Depth of Water from Reference Point	Elevation of Water	Remarks	Read By

HALEY & ALDRICH

LOW-FLOW SAMPLING FIELD FORM

Monitoring Well I.D.:	Date:	Time Started:	File Number:
Weather Conditions:		Time Ended:	Field Personnel:

Initial Readings

Measured Well Bottom (TOR-ft)	Riser Pipe Diameter (in.)
Measured Water Level (TOR-ft)	PID background (ppm)
Notes:	PID headspace (ppm)

Well Condition

Well Riser Type (place an X in one box)		Stainless Steel		Carbon Steel		PVC

Casing Condition:	OK		Repair Required:
Cap Condition:	OK		Repair Required:
Paint Condition:	OK		Repair Required:
Lock Condition:	OK		Repair Required:
Inner Casing Condition:	OK		Repair Required:
Surface Seal Condition:	OK		Repair Required:
Other:	OK		Repair Required:

Purge Information

Purging Method:		Peristaltic Pump		Bladder Pump		Grundfos Pump		Other:

Purge Start Time:	
Water Level Prior to Purging (TOR ft.)	Water Level After Purging (TOR ft.)
Amount Purged:	Flow Rate (mL per minute):
Comments:	

Time Elapsed (min)	Temperature (deg C)	pH	Conductivity (mS/cm)	Turbidity (NTUs)	Dissolved Oxygen (mg/L)	Redox (ORP)	Water Level (TOR ft)	Comments

Sampling Information

Date:	Time Sampled:	Field Personnel:

Measured Water Level (TOR ft):										
Sampling Method: (place X in box)		Stainless Steel Bailer		Peristaltic Pump		Grundfos Pump		Teflon Bailer
		Polyethylene Bailer		Bladder Pump		Other:		

Analysis:	
Sample ID:	
Odor:	Appearance:
QA/QC Samples Taken:	
Comments:	

Sampler (Print)	Sampler (signature):	Date:

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LOW-FLOW GROUNDWATER SAMPLING RECORD

Page of

PROJECT		**H&A FILE NO.**	
LOCATION		**PROJECT MGR.**	
CLIENT		**FIELD REP**	
CONTRACTOR		**DATE**	

GROUNDWATER SAMPLING INFORMATION

Well ID		
Depth Of Well (ft.) per Log		
Reference Mark		
Depth to Water from Reference Mark (ft.)		
Time		
Depth to Product (ft.)		
Field Measured Depth Of Well (ft.)		
Inside Diameter (in.)		
Standing Water Depth (ft.)		
Volume Of Water In Well (gallons/liters)		
Purging Device		
Volume of Bailer/Pump Capacity		
Cleaning Procedure		
Bails Removed/ Volume Removed		
Time Purging Started		
Time Purging Stopped		
Instrument Used to Monitor Field Parameters		
Sampling Device		
Cleaning Procedure		
Color		
Odor		

TIME SAMPLES TAKEN	VOA		
	ABN		
	Metals		

PARAMETERS	Time													
	Temp, C													
	Conductivity (umhos/cm)													
	Dissolved Oxygen (mg/L)													
	pH													
	ORP													
	Drawdown Ft													
	Volume purged/Gals													
	Turbidity (NTU)													

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

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EQUIPMENT CALIBRATION LOG

Project Name: _____
Location: _____
Model Name: _____
Model Number: _____

Employee Signature: _____
Employee Name: _____
Cal. Standards: _____
Serial Number: _____

Date	Time	GW Monitoring Standard						Calibration/Check Results						PID Standard	Calibration/ Check Result	Calibration?	Check?
		pH	Temp.	Cond.	ORP	DO	Turb.	pH	Temp.	Cond.	ORP	DO	Turb.				

Other Comments: _____

APPENDIX B
Target Organ Evaluation

APPENDIX B

UPDATED TARGET ENDPOINT ANALYSIS

Consistent with the *Supplemental RFI report*, this target endpoint analysis uses the U.S. Environmental Protection Agency (U.S. EPA) November 2019 Commercial/Industrial Regional Screening Levels (RSLs) to quantify the non-cancer hazard levels for the commercial /industrial direct contact to surface soil pathway at the four Areas of Concern (AOC) identified with a cumulative hazard index (HI) greater than 1. The RSLs are based on upper-bound exposure assumptions for direct contact with soil (incidental ingestion and dermal contact), dust inhalation, and ambient vapor inhalation. The source of the industrial soil RSLs is the Summary Table (available at: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

As noted in the main text of the *Supplemental RFI Report*, to estimate noncancer hazards:

- For each constituent for which a non-cancer based industrial soil RSL was published, ratios were calculated to compare the exposure point concentration of the constituent to the RSL. This ratio represents the non-cancer hazard ratio for that constituent (i.e., the hazard quotient or HQ).
- Non-cancer hazard ratios for all constituents within an AOC were then summed to derive a total non-cancer hazard ratio (i.e., the hazard index or HI).
- Results for each AOC were compared to the non-cancer hazard goal of an HI of 1.

Based on the evaluation, non-cancer hazards for AOCs 1, 3, 4, and 8 do not exceed an HI of 1; non-cancer hazards for AOCs 2, 5, 6, and 7 exceed an HI of 1.

For noncarcinogens, grouping constituents based on target organs and their mechanism of action may be appropriate and result in the derivation of multiple hazard indices (Ohio EPA, 2019). Therefore, when HI values exceed 1, and the HQ values associated with any given constituent of concern (COC) do not exceed 1, it is appropriate to conduct an additional evaluation of the target organ effects for each COC individually to determine if it is appropriate to sum HQ values among COCs. Separate HI values for specific target organ effects may then be calculated and evaluated against the goal of an HI of 1. This evaluation was completed for AOCs 2, 5, 6, and 7.

Based on Ohio EPA's 5 October 2020 comments on the target endpoint evaluation, a refined target endpoint analysis has been conducted for AOCs 2, 5 ,6, and 7 as part of the response to comments. This analysis is presented in this document. U.S. EPA guidance regarding the hierarchy of sources of human health dose-response values in risk assessment was followed, as reflected in the U.S. EPA Regional Screening Level tables toxicity value sources (U.S. EPA, 2019).

The constituents evaluated are all of the COCs in AOCs 2, 5, 6, and 7. Table A-1 presents the non-cancer target endpoint and source for the reference doses (RfD) and reference concentrations (RfC) used by U.S. EPA for the industrial soil RSLs for each of the COCs. We note that hazard ratios for the ingestion/dermal routes and the inhalation route for constituents that have the same target endpoint are summed together later in the process.

Each specific RSL for industrial soil includes direct contact (ingestion, dermal) and inhalation exposures, and is protective of the sum of these exposures. (See the User's Guide at the above link). The

"Composite Worker Soil" table identifies the ingestion, dermal, and inhalation components of the final industrial soil RSLs.

The final RSL is calculated using the following equation:

- Total

$$SL_{w\text{-}soil\text{-}nc\text{-}tot}\,(mg/kg) = \frac{1}{\frac{1}{SL_{w\text{-}soil\text{-}nc\text{-}ing}} + \frac{1}{SL_{w\text{-}soil\text{-}nc\text{-}der}} + \frac{1}{SL_{w\text{-}soil\text{-}nc\text{-}inh}}}$$

Using this information, the percentage component of each RSL in terms of the ingestion/dermal routes (which use the constituent's RfD) and the inhalation route (which uses the constituent's RfC) can be determined. Table A-2 shows for each COC:

- Summary Industrial Soil RSL
- Ingestion Component of the Industrial Soil RSL
- Dermal Component of the Industrial Soil RSL
- Inhalation Component of the Industrial Soil RSL
- % of the Summary Industrial Soil that is Ingestion + Dermal
- % of the Summary Industrial Soil that is Inhalation

These percentages are used in Tables B-1 through B-4 (one table for each AOC) to calculate the non-cancer hazard ratios for ingestion/dermal and for inhalation routes for each COC. The tables show for each COC:

- The total hazard ratio
- The percent of the non-cancer hazard ratio that is attributable to the ingestion/dermal routes
- The resulting non-cancer hazard ratio for the ingestion/dermal routes
- The target endpoint for the ingestion/dermal routes
- The percent of the non-cancer hazard ratio that is attributable to the inhalation route
- The resulting non-cancer hazard ratio for the inhalation route
- The target endpoint for the inhalation route

This same information is presented in Tables C-1 through C-4 (for each AOC) organized by target endpoint. A constituent and hazard ratios may be included in multiple target endpoints based on both the RfD or RfC effects. The total HI values are calculated in Tables C-1 through C-4 using two different summations based on the target endpoints:

- In the column "Total HI by Target Organ (Undifferentiated by Route)," total non-cancer hazard ratios from the *Supplemental RFI* tables for AOC-2, 5, 6, and 7 (Tables 12, 15, 16, and 17 respectively) are summed for each target endpoint. The total HI value is calculated assuming that all exposure routes (ingestion/dermal and inhalation) could result in risk to the same target organ even if the identified target organ endpoints for the two exposure routes are different.
- In column "Total HI by Target Organ (Pathway-Specific)", non-cancer hazard ratios are apportioned according to the percent of the hazard ratio that is attributable to either the ingestion/dermal routes and/or the inhalation routes, and then summed for when that exposure route is associated with that target endpoint.
- Yellow shading in Tables C-1 through C-4 indicates differences in HQ or HI values in the two columns. All HI values are at or below 1 when evaluated by target organ effect.

According to Ohio EPA grouping non-carcinogens based on target organs and mechanism of action may be appropriate (Ohio EPA, 2019); similarly, U.S. EPA states that dose additivity is most properly applied to chemicals that induce the same effect (U.S. EPA, 1989). However, there remain some uncertainties that can result in over- or under-estimating risk when using target organ risk summation.

As noted in the beginning discussion of this Appendix, non-cancer hazard ratios for all constituents within an AOC were initially summed to derive the hazard index. This method of evaluating non-cancer hazards assumes that each chemical, regardless of the health effect it may have on humans, is dose-additive (U.S. EPA, 2000). This method of summing the risk of adverse health effects for COCs without accounting for the pathway of exposure may *overestimate* risk.

The target organ evaluation may *underestimate* risk because it does not account for secondary or synergistic effects between chemicals or different organ systems. Conversely, the target organ evaluation may overestimate risk even for the same target organ because chemicals that have different modes of action may not result in dose-additive responses. Furthermore, when toxic effects are known to occur but at much higher exposure levels than the levels being assessed at a Site, then the HI for those effects is an overestimate of risk.

As noted above, the HI values based on two approaches to summation of the target organ evaluations presented herein are at or below the target hazard of 1.

References

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U.S. EPA, 2000. Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures. PA/630/R-00/002, August 2000.

U.S. EPA, 2019. Commercial/Industrial Regional Screening Levels (RSLs), November 2019.

TABLES

TABLE A-1
NONCANCER TARGET ENDPOINTS FOR AOC-2, AOC-5, AOC-6 AND AOC-7 COCs
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Target Endpoint - Ingestion/Dermal	Basis	Chronic Oral Reference Dose RfD-o (mg/kg-day)	Source	Target Endpoint - Inhalation	Basis	Chronic Inhalation Reference Concentration RfC (mg/m3)	Source
75-34-3	1,1-Dichloroethane	Kidney	Increased urinary enzyme markers for renal damage and CNS depression	2.0E-01	P				
75-35-4	1,1-Dichloroethene	Liver	Liver toxicity (fatty change)	5.0E-02	I	Liver	Liver toxicity (fatty change)	2.0E-01	I
120-82-1	1,2,4-Trichlorobenzene	Endocrine - Adrenal	Increased adrenal weights; vacuolization of zona fasciculata in the cortex	1.0E-02	I	Kidney	Increased urinary excretion of porphyrins	2.0E-03	P
95-50-1	1,2-Dichlorobenzene	None observed	No adverse effects observed	9.0E-02	I	General Toxicity - Growth	Decreased weight gain	2.0E-01	H
541-73-1	1,3-Dichlorobenzene [a]	Liver	Serum AP level	7.0E-02	A	Liver	Increased liver weights	8.0E-01	I
106-46-7	1,4-Dichlorobenzene	Liver	Serum AP level	7.0E-02	A	Liver	Increased liver weights	8.0E-01	I
120-83-2	2,4-Dichlorophenol	Immune System	Decreased delayed hypersensitivity response	3.0E-03	I				
105-67-9	2,4-Dimethylphenol	Nervous System, Hematological	Clinical signs (lethargy, prostration, and ataxia) and hematological changes	2.0E-02	I				
78-93-3	2-Butanone (Methyl Ethyl Ketone)	Developmental	Decreased pup body weight	6.0E-01	I	Developmental, Musculoskeletal	Developmental toxicity (skeletal variations)	5.0E+00	I
591-78-6	2-Hexanone	Nervous System	Axonal swelling of the peripheral nerve	5.0E-03	I	Nervous System	Motor conduction velocity of the sciatic-tibial nerve	3.0E-02	I
91-57-6	2-Methylnaphthalene	Respiratory	Pulmonary alveolar proteinosis	4.0E-03	I				
95-48-7	2-Methylphenol (o-Cresol)	Nervous System, General Toxicity - Growth	Decreased body weights and neurotoxicity	5.0E-02	I	Nervous System	Neurotoxicity	6.0E-01	C
3/4-CRESOL	3&4-Methylphenol [a]	Nervous System, General Toxicity - Growth	Decreased body weights and neurotoxicity	5.0E-02	I	Nervous System	Neurotoxicity	6.0E-01	C
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)					Developmental, Musculoskeletal	Reduced fetal body weight, skeletal variations, and increased fetal death in mice, and skeletal variations in rats.	3.0E+00	I
83-32-9	Acenaphthene	Liver	Hepatotoxicity	6.0E-02	I				
67-64-1	Acetone	Kidney	Nephropathy	9.0E-01	I	Nervous System	Neurobehavioral effects	3.1E+01	A
98-86-2	Acetophenone	None observed	No observed effects	1.0E-01	I				
7429-90-5	Aluminum	Nervous System	Minimal neurotoxicity in the offspring of mice	1.0E+00	P	Nervous System	Psychomotor and cognitive impairment	5.0E-03	P
120-12-7	Anthracene	None observed	No observed effects	3.0E-01	I				
7440-36-0	Antimony	General Toxicity - Mortality, Hematological	Longevity, blood glucose, and cholesterol	4.0E-04	I	Respiratory	Chronic lung inflammation in female rats exposed to antimony trioxide	3.0E-04	A
11097-69-1	Aroclor-1254 (PCB-1254)	Immune System, Skin, Ocular	Ocular exudate, inflamed and prominent Meibomian glands, distorted growth of finger and toe nails; decreased antibody (IgG and IgM) response to sheep erythrocytes	2.0E-05	I				
7440-38-2	Arsenic	Skin, Vascular	Hyperpigmentation, keratosis and possible vascular complications	3.0E-04	I	Developmental, Nervous System	Decreased intellectual function in 10 year old children	1.5E-05	C
7440-39-3	Barium	Kidney	Nephropathy	2.0E-01	I	Developmental	Fetotoxicity	5.0E-04	H
100-52-7	Benzaldehyde	Gastrointestinal, Kidney	Forestomach lesions, kidney toxicity	1.0E-01	I				
71-43-2	Benzene	Immune System	Decreased lymphocyte count	4.0E-03	I	Immune System	Decreased lymphocyte count	3.0E-02	I
50-32-8	Benzo(a)pyrene	Developmental	Neurobehavioral changes	3.0E-04	I	Developmental	Decreased embryo/fetal survival	2.0E-06	I
191-24-2	Benzo(g,h,i)perylene [a]	Kidney	Kidney effects (renal tubular pathology, decreased kidney weights)	3.0E-02	I				
7440-41-7	Beryllium	Gastrointestinal	Small intestinal lesions	2.0E-03	I	Immune System, Respiratory	Beryllium sensitization and progression to CBD	2.0E-05	I

TABLE A-1
NONCANCER TARGET ENDPOINTS FOR AOC-2, AOC-5, AOC-6 AND AOC-7 COCs
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Target Endpoint - Ingestion/Dermal	Basis	Chronic Oral Reference Dose RfD-o (mg/kg-day)	Source	Target Endpoint - Inhalation	Basis	Chronic Inhalation Reference Concentration RfC (mg/m3)	Source
92-52-4	Biphenyl	Kidney	Renal papillary mineralization	5.0E-01	I	Respiratory, Liver, Kidney	Congestion and edema of the lungs were identified as critical respiratory effects, and congestion and edema in the liver and kidneys were identified as critical effects at the remote site of studied CD1 mice.	4.0E-04	X
117-81-7	bis(2-Ethylhexyl)phthalate	Liver	Increased relative liver weight	2.0E-02	I				
7440-43-9	Cadmium	Kidney	Significant proteinuria	1.0E-03	I	Kidney	Prevalence of β2-microglobulin proteinuria	1.0E-05	A
75-15-0	Carbon disulfide	Developmental	Fetal toxicity/ malformations	1.0E-01	I	Nervous System	Peripheral nervous system dysfunction	7.0E-01	I
108-90-7	Chlorobenzene	Liver	Histopathologic changes in liver	2.0E-02	I	Kidney, Liver	Liver - Increased weight and hepatocellualr hypertrophy. Kidney - Increased weights, tubule dilation, inflamation of the interstitial cells, and regeneration of the epithelium in males	5.0E-02	P
7440-47-3	Chromium	None observed	No effects observed	1.5E+00	I				
18540-29-9	Chromium VI (Hexavalent)	None observed	None reported	3.0E-03	I	Respiratory	Lactate dehydrogenase in bronchioalveolar lavage fluid	1.0E-04	I
156-59-2	cis-1,2-Dichloroethene	Kidney	Increased relative kidney weight in male rats	2.0E-03	I				
7440-48-4	Cobalt	Endocrine - Thyroid	Decreased iodine uptake	3.0E-04	P	Respiratory	Decreased pulmonary function and respiratory tract irritation	6.0E-06	P
7440-50-8	Copper	Gastrointestinal	Irritation	4.0E-02	H				
57-12-5	Cyanide	Reproductive	Decreased cauda epididymis weight in male F344/N rats. The RfD for cyanide, free is presented in section 1.A.3 of the hydrogen cyanide and cyanide salts IRIS Summary.	6.0E-04	I	Endocrine - Thyroid	Thyroid enlargement and altered iodide uptake	8.0E-04	I
110-82-7	Cyclohexane					Developmental	Reduced pup weights	6.0E+00	I
132-64-9	Dibenzofuran	General Toxicity - Growth	Reduced length and organ weight, excessabdominal fat	1.0E-03	X				
131-11-3	Dimethyl phthalate [a]	General Toxicity - Growth	Decreased growth rate, food consumption and altered organ weights	8.0E-01	I				
84-74-2	Di-n-butylphthalate	General Toxicity - Mortality	Increased mortality	1.0E-01	I				
100-41-4	Ethylbenzene	Liver, Kidney	Liver and kidney toxicity	1.0E-01	I	Developmental	Developmental toxicity	1.0E+00	I
206-44-0	Fluoranthene	Kidney, Liver	Nephropathy, increased liver weights	4.0E-02	I				
86-73-7	Fluorene	Hematological	Decreased RBC, packed cell volume and hemoglobin	4.0E-02	I				
118-74-1	Hexachlorobenzene	Liver	Liver effects	8.0E-04	I				
98-82-8	Isopropylbenzene (Cumene)	Kidney	Increased average kidney weight	1.0E-01	I	Endocrine - Adrenal, Kidney	Increased kidney weights, adrenal weights	4.0E-01	I
7439-96-5	Manganese	Nervous System	CNS effects	1.4E-01	I	Nervous System	Impairment of neurobehavioral function	5.0E-05	I
7439-97-6	Mercury					Nervous System	Hand tremor; increases in memory disturbances; slight subjective and objective evidence of autonomic dysfunction	3.0E-04	I
79-20-9	Methyl Acetate	Liver, Cardiovascular, Nervous System	Increased serum alkaline phosphatase (SAP) and serum glutamic pyruvic transaminase (SGPT), and decreased brain weight	1.0E+00	X				
108-87-2	Methyl cyclohexane [a]					Developmental	Reduced pup weights	6.0E+00	I
75-09-2	Methylene chloride	Liver	Hepatic effects (hepatic vacuolation, liver foci)	6.0E-03	I	Liver	Hepatic effects (hepatic vacuolation)	6.0E-01	I

TABLE A-1
NONCANCER TARGET ENDPOINTS FOR AOC-2, AOC-5, AOC-6 AND AOC-7 COCs
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Target Endpoint - Ingestion/Dermal	Basis	Chronic Oral Reference Dose RfD-o (mg/kg-day)	Source	Target Endpoint - Inhalation	Basis	Chronic Inhalation Reference Concentration RfC (mg/m3)	Source
91-20-3	Naphthalene	General Toxicity - Growth	Decreased mean terminal body weight	2.0E-02	I	Respiratory	Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively	3.0E-03	I
7440-02-0	Nickel	General Toxicity - Growth	Decreased body and organ weights	2.0E-02	I	Respiratory	Respiratory effects (chronic lung inflammation and bronchialization)	9.0E-05	A
85-01-8	Phenanthrene [a]	Kidney	Kidney effects (renal tubular pathology, decreased kidney weights)	3.0E-02	I				
108-95-2	Phenol	General Toxicity - Growth	Decreased maternal weight gain	3.0E-01	I	Liver, Nervous System	Systemic effects including liver and nervous system effects	2.0E-01	C
129-00-0	Pyrene	Kidney	Kidney effects (renal tubular pathology, decreased kidney weights)	3.0E-02	I				
7782-49-2	Selenium	Nervous System, Hematological, Skin	Clinical selenosis	5.0E-03	I	Nervous system, Hematological, Skin	Clinical selenosis	2.0E-02	C
7440-22-4	Silver	Skin	Argyria	5.0E-03	I				
127-18-4	Tetrachloroethene	Nervous System, Ocular	Neurotoxicity (changes in reaction time and cognitive effects), change in color vision	6.0E-03	I	Nervous System, Ocular	Neurotoxicity (changes in reaction time and cognitive effects), change in color vision	4.0E-02	I
7440-28-0	Thallium	Dermal - Hair	Hair follicle atrophy	1.0E-05	X				
108-88-3	Toluene	Kidney	Increased kidney weight	8.0E-02	I	Nervous System	Neurological effects	5.0E+00	I
156-60-5	trans-1,2-Dichloroethene	Immune system	Decrease in number of antibody forming cells (AFCs) against sheep red blood cells (sRBCs) in male mice	2.0E-02	I				
79-01-6	Trichloroethene	Developmental, Immune System	Decreased thymus weight in mice, developmental immunotoxicity (decreased PFC and increased delayed-type hypersensitivity) in mice, fetal heart malformations in rats	5.0E-04	I	Developmental, Immune System	Decreased thymus weight in mice, fetal heart malformations in rats	2.0E-03	I
7440-62-2	Vanadium	Dermal - Hair	Decreased hair cystine	5.0E-03	I	Respiratory	Degeneration of epiglottis respiratory epithelium	1.0E-04	A
75-01-4	Vinyl chloride	Liver	Liver cell polymorphism	3.0E-03	I	Liver	Liver cell polymorphism	1.0E-01	I
1330-20-7	Xylene (total)	General Toxicity - Growth, Mortality	Decreased body weight, increased mortality	2.0E-01	I	Nervous System	Impaired motor coordination (decreased rotarod performance)	1.0E-01	I
7440-66-6	Zinc	Immune System, Hematological	Decreases in erythrocyte Cu, Zn-superoxide dismutase (ESOD) activity in healthy adult male and female volunteers	3.0E-01	I				

Notes and Abbreviations:

mg/kg = milligrams per kilogram

mg/m^3 = milligrams per cubic meter

Sources:

I = IRIS
P = PPRTV
O = OPP
A = ATSDR
C = Cal EPA
X = PPRTV Screening Level
H = HEAST

[a] - Surrogates:

cis-1,2-dichloroethylene used as a surrogate for 1,2-Dichloroethene (total).
Chromium (III) used as a surrogate for Chromium, Total.
Cyclohexane used as a surrogate for methyl cychlohexane.
1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene.
Diethyl phthalate used as a surrogate for dimethylphthalate.
2-methylphenol used as a surrogate for 3&4-methylphenol
Pyrene used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
1,1,2-trichloroethane used as a surrogate for trichloroethane.
Hydrogen Cyanide inhalation target endpoint is used as a surrogate for Cyanide.

TABLE A-2
INDUSTRIAL SOIL RSL - PERCENT CONTRIBUTION OF INGESTION/DERMAL AND INHALATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	USEPA November 2019 Industrial Soil RSL Noncancer Hazard Index (HI) = 1				Ratio of Ingestion/ Derm to Total SL	Ratio of Inhalation to Total SL
		Noncarcinogenic SL THI=1 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)		
75-34-3	1,1-Dichloroethane	230000	230000			100%	
75-35-4	1,1-Dichloroethene	1000	58000		1000	2%	98%
120-82-1	1,2,4-Trichlorobenzene	260	12000		260	2%	98%
95-50-1	1,2-Dichlorobenzene	9300	110000		10000	8%	92%
541-73-1	1,3-Dichlorobenzene	25000	82000		37000	31%	69%
106-46-7	1,4-Dichlorobenzene	25000	82000		37000	31%	69%
120-83-2	2,4-Dichlorophenol	2500	3500	8300		100%	
105-67-9	2,4-Dimethylphenol	16000	23000	55000		100%	
78-93-3	2-Butanone (Methyl Ethyl Ketone)	190000	700000		270000	28%	72%
591-78-6	2-Hexanone	1300	5800		1700	23%	77%
91-57-6	2-Methylnaphthalene	3000	4700	8500		100%	
95-48-7	2-Methylphenol (o-Cresol)	41000	58000	140000	3600000000	99.999%	0.001%
3/4-CRESOL	3&4-Methylphenol	41000	58000	140000	3600000000	99.999%	0.001%
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	140000			140000		100%
83-32-9	Acenaphthene	45000	70000	130000		100%	
67-64-1	Acetone	670000	1100000		1800000	62%	38%
98-86-2	Acetophenone	120000	120000			100%	
7429-90-5	Aluminum	1100000	1200000		30000000	96%	4%
120-12-7	Anthracene	230000	350000	640000		100%	
7440-36-0	Antimony	470	470		1800000	99.974%	0.026%
11097-69-1	Aroclor-1254 (PCB-1254)	15	23	39		100%	
7440-38-2	Arsenic	480	580	2800	89000	99%	1%
7440-39-3	Barium	220000	230000		3000000	93%	7%
100-52-7	Benzaldehyde	120000	120000			100%	
71-43-2	Benzene	420	4700		460	9%	91%
50-32-8	Benzo(a)pyrene	220	350	640	12000	98%	2%
191-24-2	Benzo(g,h,i)perylene	23000	35000	64000		100%	
7440-41-7	Beryllium	2300	2300		120000	98%	2%
92-52-4	Biphenyl	200	580000		200	0%	100%
117-81-7	bis(2-Ethylhexyl)phthalate	16000	23000	55000		100%	
7440-43-9	Cadmium	980	1200	6900	60000	98%	2%
75-15-0	Carbon disulfide	3500	120000		3600	3%	97%
108-90-7	Chlorobenzene	1300	23000		1400	6%	94%
7440-47-3	Chromium	1800000	1800000			100%	
18540-29-9	Chromium VI (Hexavalent)	3500	3500		600000	99%	1%
156-59-2	cis-1,2-Dichloroethene	2300	2300			100%	
7440-48-4	Cobalt	350	350		36000	99%	1%
7440-50-8	Copper	47000	47000			100%	
57-12-5	Cyanide	150	700		190	21%	79%
110-82-7	Cyclohexane	27000			27000		100%
132-64-9	Dibenzofuran	1000	1200	9200		100%	
131-11-3	Dimethyl phthalate	660000	930000	2200000		100%	
84-74-2	Di-n-butylphthalate	82000	120000	280000		100%	
100-41-4	Ethylbenzene	20000	120000		25000	17%	83%
206-44-0	Fluoranthene	30000	47000	85000		100%	
86-73-7	Fluorene	30000	47000	85000		100%	
118-74-1	Hexachlorobenzene	930	930			100%	
98-82-8	Isopropylbenzene (Cumene)	9900	120000		11000	8%	92%
7439-96-5	Manganese	26000	28000		300000	91%	9%
7439-97-6	Mercury	46			46		100%
79-20-9	Methyl Acetate	1200000	1200000			100%	
108-87-2	Methyl cyclohexane	27000			27000		100%
75-09-2	Methylene chloride	3200	7000		5800	45%	55%
91-20-3	Naphthalene	590	23000	42000	610	4%	96%
7440-02-0	Nickel	22000	23000		540000	96%	4%
85-01-8	Phenanthrene	23000	35000	64000		100%	
108-95-2	Phenol	250000	350000	830000	1200000000	99.979%	0.021%
129-00-0	Pyrene	23000	35000	64000		100%	
7782-49-2	Selenium	5800	5800		120000000	99.995%	0.005%
7440-22-4	Silver	5800	5800			100%	
127-18-4	Tetrachloroethene	390	7000		410	6%	94%
7440-28-0	Thallium	12	12			100%	
108-88-3	Toluene	47000	93000		94000	50%	50%
156-60-5	trans-1,2-Dichloroethene	23000	23000			100%	
79-01-6	Trichloroethene	19	580		19	3%	97%
7440-62-2	Vanadium	5800	5900		600000	99%	1%
75-01-4	Vinyl chloride	370	3500		420	11%	89%
1330-20-7	Xylene (total)	2500	230000		2500	1%	99%
7440-66-6	Zinc	350000	350000			100%	

TABLE A-2
INDUSTRIAL SOIL RSL - PERCENT CONTRIBUTION OF INGESTION/DERMAL AND INHALATION
RACER ELYRIA
ELYRIA, OHIO

Abbreviations:

COC = constituent of concern
HI = Hazard index
mg/kg = milligrams per kilogram
RSL = Regional Screening Level
SL = Screening level
THI = Target Hazard Index
THQ = Target Hazard Quotient
USEPA = United States Environmental Protection Agency

Notes:

(1) USEPA Regional Screening Levels are the November 2019 Industrial Soil values, based on a hazard index of 1.
https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables

Substitutions:

cis-1,2-dichloroethylene used as a surrogate for 1,2-Dichloroethene (total).
Chromium (III) used as a surrogate for Chromium, Total.
Cyclohexane used as a surrogate for methyl cychlohexane.
1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene.
Diethyl phthalate used as a surrogate for dimethylphthalate.
2-methylphenol used as a surrogate for 3&4-methylphenol
Pyrene used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
1,1,2-trichloroethane used as a surrogate for trichloroethane.

TABLE B-1
AOC-2: NORTHERN SLUDGE AREA - TARGET ORGAN SUMMARY
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total Non-cancer Hazard Ratio	Ingestion/Dermal			Inhalation		
			Noncancer Hazard Ratio - Ingestion/ Dermal (Percent)	Noncancer Hazard Ratio - Ingestion/ Dermal	Target Endpoint - Ingestion/Dermal	Noncancer Hazard Ratio - Inhalation	Noncancer Inhalation Hazard Ratio	Target Endpoint - Inhalation
91-57-6	2-Methylnaphthalene	3.E-05	100%	3.E-05	Respiratory			
7429-90-5	Aluminum	2.E-02	96%	2.E-02	Nervous System	4%	8.E-04	Nervous System
7440-36-0	Antimony	7.E-01	99.97%	7.E-01	General Toxicity - Mortality, Hematological	0.03%	2.E-04	Respiratory
7440-38-2	Arsenic	6.E-02	99%	6.E-02	Skin, Vascular	1%	3.E-04	Developmental, Nervous System
7440-39-3	Barium	1.E-03	93%	9.E-04	Kidney	7%	7.E-05	Developmental
50-32-8	Benzo(a)pyrene	7.E-05	98%	7.E-05	Developmental	2%	1.E-06	Developmental
191-24-2	Benzo(g,h,i)perylene	7.E-07	100%	7.E-07	Kidney			
7440-41-7	Beryllium	4.E-04	98%	4.E-04	Gastrointestinal	2%	8.E-06	Immune System, Respiratory
117-81-7	bis(2-Ethylhexyl)phthalate	2.E-04	100%	2.E-04	Liver			
7440-43-9	Cadmium	2.E-02	98%	2.E-02	Kidney	2%	4.E-04	Kidney
75-15-0	Carbon disulfide	4.E-07	3%	1.E-08	Developmental	97%	4.E-07	Nervous System
7440-47-3	Chromium	2.E-02	100%	2.E-02	None observed			
18540-29-9	Chromium VI (Hexavalent)	4.E-03	99%	4.E-03	None observed	1%	2.E-05	Respiratory
7440-48-4	Cobalt	3.E-02	99%	3.E-02	Endocrine - Thyroid	1%	3.E-04	Respiratory
7440-50-8	Copper	1.E-01	100%	1.E-01	Gastrointestinal			
57-12-5	Cyanide	1.E+00	21%	2.E-01	Reproductive	79%	7.E-01	Endocrine - Thyroid
132-64-9	Dibenzofuran	2.E-05	100%	2.E-05	General Toxicity - Growth			
84-74-2	Di-n-butylphthalate	3.E-07	100%	3.E-07	General Toxicity - Mortality			
206-44-0	Fluoranthene	1.E-06	100%	1.E-06	Kidney, Liver			
7439-96-5	Manganese	6.E-02	91%	5.E-02	Nervous System	9%	5.E-03	Nervous System
7439-97-6	Mercury	1.E-02				100%	1.E-02	Nervous System
79-20-9	Methyl Acetate	2.E-08	100%	2.E-08	Liver, Cardiovascular, Nervous System			
75-09-2	Methylene chloride	1.E-05	45%	5.E-06	Liver	55%	6.E-06	Liver
91-20-3	Naphthalene	1.E-04	4%	4.E-06	General Toxicity - Growth	96%	1.E-04	Respiratory
7440-02-0	Nickel	6.E-01	96%	6.E-01	General Toxicity - Growth	4%	2.E-02	Respiratory
85-01-8	Phenanthrene	1.E-06	100%	1.E-06	Kidney			
129-00-0	Pyrene	1.E-06	100%	1.E-06	Kidney			
7782-49-2	Selenium	6.E-04	99.995%	6.E-04	Nervous System, Hematological, Skin	0.005%	3.E-08	Nervous system, Hematological, Skin
7440-22-4	Silver	1.E-03	100%	1.E-03	Skin			
7440-28-0	Thallium	8.E-01	100%	8.E-01	Dermal - Hair			
79-01-6	Trichloroethene	5.E-05	3%	2.E-06	Developmental, Immune System	97%	5.E-05	Developmental, Immune System
7440-62-2	Vanadium	5.E-03	99%	5.E-03	Dermal - Hair	1%	5.E-05	Respiratory
7440-66-6	Zinc	8.E-03	100%	8.E-03	Immune System, Hematological			
			Sum:	**3.E+00**		**Sum:**	**8.E-01**	

TABLE B-2
AOC-5: SOUTHERN TRENCHES AREA - TARGET ORGAN SUMMARY
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total Noncancer Hazard Ratio	Ingestion/Dermal			Inhalation		
			Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Ingestion/ Dermal	Target Endpoint - Ingestion/Dermal	Noncancer Hazard Ratio - Inhalation	Noncancer Inhalation Hazard Ratio	Target Endpoint - Inhalation
75-34-3	1,1-Dichloroethane	2.E-09	100%	2.E-09	Kidney			
75-35-4	1,1-Dichloroethene	7.E-05	2%	1.E-06	Liver	98%	7.E-05	Liver
120-82-1	1,2,4-Trichlorobenzene	7.E-04	2%	1.E-05	Endocrine - Adrenal	98%	7.E-04	Kidney
95-50-1	1,2-Dichlorobenzene	1.E-05	8%	8.E-07	None observed	92%	9.E-06	General Toxicity - Growth
541-73-1	1,3-Dichlorobenzene	8.E-08	31%	2.E-08	Liver	69%	6.E-08	Liver
106-46-7	1,4-Dichlorobenzene	3.E-08	31%	9.E-09	Liver	69%	2.E-08	Liver
78-93-3	2-Butanone (Methyl Ethyl Ketone)	4.E-06	28%	1.E-06	Developmental	72%	3.E-06	Developmental, Musculoskeletal
591-78-6	2-Hexanone	1.E-04	23%	3.E-05	Nervous System	77%	1.E-04	Nervous System
91-57-6	2-Methylnaphthalene	1.E-04	100%	1.E-04	Respiratory			
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	2.E-06				100%	2.E-06	Developmental, Musculoskeletal
67-64-1	Acetone	2.E-07	62%	1.E-07	Kidney	38%	8.E-08	Nervous System
120-12-7	Anthracene	1.E-07	100%	1.E-07	None observed			
11097-69-1	Aroclor-1254 (PCB-1254)	9.E-01	100%	9.E-01	Immune System, Skin, Ocular			
7440-39-3	Barium	5.E-04	93%	5.E-04	Kidney	7%	4.E-05	Developmental
71-43-2	Benzene	8.E-03	9%	7.E-04	Immune System	91%	7.E-03	Immune System
50-32-8	Benzo(a)pyrene	3.E-04	98%	2.E-04	Developmental	2%	5.E-06	Developmental
191-24-2	Benzo(g,h,i)perylene	2.E-06	100%	2.E-06	Kidney			
7440-41-7	Beryllium	4.E-04	98%	4.E-04	Gastrointestinal	2%	7.E-06	Immune System, Respiratory
92-52-4	Biphenyl	1.E-03	0.03%	4.E-07	Kidney	99.97%	1.E-03	Respiratory, Liver, Kidney
117-81-7	bis(2-Ethylhexyl)phthalate	8.E-05	100%	8.E-05	Liver			
7440-43-9	Cadmium	6.E-04	98%	5.E-04	Kidney	2%	9.E-06	Kidney
75-15-0	Carbon disulfide	2.E-06	3%	5.E-08	Developmental	97%	2.E-06	Nervous System
108-90-7	Chlorobenzene	2.E-05	6%	1.E-06	Liver	94%	2.E-05	Kidney, Liver
7440-47-3	Chromium	2.E-03	100%	2.E-03	None observed			
156-59-2	cis-1,2-Dichloroethene	9.E-05	100%	9.E-05	Kidney			
7440-50-8	Copper	8.E-02	100%	8.E-02	Gastrointestinal			
110-82-7	Cyclohexane	5.E-06				100%	5.E-06	Developmental
132-64-9	Dibenzofuran	4.E-05	100%	4.E-05	General Toxicity - Growth			
100-41-4	Ethylbenzene	2.E-05	17%	4.E-06	Liver, Kidney	83%	2.E-05	Developmental
206-44-0	Fluoranthene	4.E-06	100%	4.E-06	Kidney, Liver			
86-73-7	Fluorene	2.E-06	100%	2.E-06	Hematological			
118-74-1	Hexachlorobenzene	6.E-05	100%	6.E-05	Liver			
98-82-8	Isopropylbenzene (Cumene)	1.E-05	8%	1.E-06	Kidney	92%	1.E-05	Endocrine - Adrenal, Kidney
7439-96-5	Manganese	3.E-01	91%	3.E-01	Nervous System	9%	3.E-02	Nervous System
7439-97-6	Mercury	1.E-03				100%	1.E-03	Nervous System
79-20-9	Methyl acetate	8.E-07	100%	8.E-07	Liver, Cardiovascular, Nervous System			
108-87-2	Methyl cyclohexane	2.E-06				100%	2.E-06	Developmental
91-20-3	Naphthalene	4.E-04	4%	1.E-05	General Toxicity - Growth	96%	3.E-04	Respiratory
7440-02-0	Nickel	7.E-02	96%	7.E-02	General Toxicity - Growth	4%	3.E-03	Respiratory
85-01-8	Phenanthrene	1.E-05	100%	1.E-05	Kidney			
129-00-0	Pyrene	7.E-06	100%	7.E-06	Kidney			
127-18-4	Tetrachloroethene	1.E-06	6%	7.E-08	Nervous System, Ocular	94%	1.E-06	Nervous System, Ocular
7440-28-0	Thallium	2.E-01	100%	2.E-01	Dermal - Hair			
108-88-3	Toluene	2.E-04	50%	1.E-04	Kidney	50%	9.E-05	Nervous System
156-60-5	trans-1,2-Dichloroethene	2.E-06	100%	2.E-06	Immune system			
79-01-6	Trichloroethene	5.E-02	3%	1.E-03	Developmental, Immune System	97%	5.E-02	Developmental, Immune System
75-01-4	Vinyl chloride	2.E-04	11%	2.E-05	Liver	89%	2.E-04	Liver
1330-20-7	Xylene (total)	8.E-04	1%	9.E-06	General Toxicity - Growth, Mortality	99%	8.E-04	Nervous System
7440-66-6	Zinc	2.E-02	100%	2.E-02	Immune System, Hematological			
			Sum:	**2.E+00**		**Sum:**	**9.E-02**	

TABLE B-3
AOC-6: NORTHERN DIE STORAGE PAD AREA - TARGET ORGAN SUMMARY
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total Noncancer Hazard Ratio	Ingestion/Dermal			Inhalation		
			Noncancer Hazard Ratio - Ingestion/ Dermal (Percent)	Noncancer Hazard Ratio - Ingestion/ Dermal	Target Endpoint - Ingestion/Dermal	Noncancer Hazard Ratio - Inhalation	Noncancer Inhalation Hazard Ratio	Target Endpoint - Inhalation
95-50-1	1,2-Dichlorobenzene	4.E-08	8%	3.E-09	None observed	92%	3.E-08	General Toxicity - Growth
541-73-1	1,3-Dichlorobenzene	1.E-08	31%	4.E-09	Liver	69%	9.E-09	Liver
106-46-7	1,4-Dichlorobenzene	2.E-08	31%	5.E-09	Liver	69%	1.E-08	Liver
120-83-2	2,4-Dichlorophenol	6.E-05	100%	6.E-05	Immune System			
105-67-9	2,4-Dimethylphenol	1.E-05	100%	1.E-05	Nervous System, Hematological			
78-93-3	2-Butanone (Methyl Ethyl Ketone)	2.E-07	28%	5.E-08	Developmental	72%	1.E-07	Developmental, Musculoskeletal
591-78-6	2-Hexanone	1.E-06	23%	3.E-07	Nervous System	77%	9.E-07	Nervous System
91-57-6	2-Methylnaphthalene	5.E-05	100%	5.E-05	Respiratory			
95-48-7	2-Methylphenol (o-Cresol)	4.E-06	99.999%	4.E-06	Nervous System, General Toxicity - Growth	0.001%	5.E-11	Nervous System
3/4-CRESOL	3&4-Methylphenol	2.E-05	100%	2.E-05	Nervous System, General Toxicity - Growth	0%	2.E-10	Nervous System
67-64-1	Acetone	3.E-07	62%	2.E-07	Kidney	38%	1.E-07	Nervous System
98-86-2	Acetophenone	3.E-06	100%	3.E-06	None observed			
120-12-7	Anthracene	2.E-07	100%	2.E-07	None observed			
11097-69-1	Aroclor-1254 (PCB-1254)	5.E-03	100%	5.E-03	Immune System, Skin, Ocular			
7440-39-3	Barium	3.E-03	93%	3.E-03	Kidney	7%	2.E-04	Developmental
100-52-7	Benzaldehyde	2.E-06	100%	2.E-06	Gastrointestinal, Kidney			
71-43-2	Benzene	5.E-06	9%	4.E-07	Immune System	91%	4.E-06	Immune System
92-52-4	Biphenyl	2.E-03	0%	8.E-07	Kidney	100%	2.E-03	Respiratory, Liver, Kidney
117-81-7	bis(2-Ethylhexyl)phthalate	2.E-04	100%	2.E-04	Liver			
7440-43-9	Cadmium	6.E-03	98%	6.E-03	Kidney	2%	1.E-04	Kidney
75-15-0	Carbon disulfide	8.E-07	3%	2.E-08	Developmental	97%	7.E-07	Nervous System
108-90-7	Chlorobenzene	2.E-07	6%	1.E-08	Liver	94%	2.E-07	Kidney, Liver
7440-47-3	Chromium	6.E-04	100%	6.E-04	None observed			
156-59-2	cis-1,2-Dichloroethene	4.E-07	100%	4.E-07	Kidney			
7440-48-4	Cobalt	7.E-02	99%	7.E-02	Endocrine - Thyroid	1%	6.E-04	Respiratory
7440-50-8	Copper	8.E-01	100%	8.E-01	Gastrointestinal			
110-82-7	Cyclohexane	2.E-08				100%	2.E-08	Developmental
132-64-9	Dibenzofuran	3.E-04	100%	3.E-04	General Toxicity - Growth			
100-41-4	Ethylbenzene	9.E-08	17%	1.E-08	Liver, Kidney	83%	7.E-08	Developmental
206-44-0	Fluoranthene	8.E-06	100%	8.E-06	Kidney, Liver			
86-73-7	Fluorene	3.E-06	100%	3.E-06	Hematological			
118-74-1	Hexachlorobenzene	5.E-05	100%	5.E-05	Liver			
7439-96-5	Manganese	6.E-02	91%	6.E-02	Nervous System	9%	5.E-03	Nervous System
7439-97-6	Mercury	3.E-03				100%	3.E-03	Nervous System
108-87-2	Methyl cyclohexane	2.E-08				100%	2.E-08	Developmental
75-09-2	Methylene chloride	3.E-07	45%	1.E-07	Liver	55%	1.E-07	Liver
91-20-3	Naphthalene	2.E-03	4%	9.E-05	General Toxicity - Growth	96%	2.E-03	Respiratory
7440-02-0	Nickel	1.E+00	96%	9.E-01	General Toxicity - Growth	4%	4.E-02	Respiratory
85-01-8	Phenanthrene	2.E-05	100%	2.E-05	Kidney			
108-95-2	Phenol	5.E-07	99.98%	5.E-07	General Toxicity - Growth	0.02%	1.E-10	Liver, Nervous System
129-00-0	Pyrene	4.E-06	100%	4.E-06	Kidney			
7440-22-4	Silver	1.E-03	100%	1.E-03	Skin			
108-88-3	Toluene	1.E-07	50%	5.E-08	Kidney	50%	5.E-08	Nervous System
79-01-6	Trichloroethene	8.E-05	3%	3.E-06	Developmental, Immune System	97%	8.E-05	Developmental, Immune System
1330-20-7	Xylene (total)	3.E-06	1%	3.E-08	General Toxicity - Growth, Mortality	99%	3.E-06	Nervous System
7440-66-6	Zinc	2.E-01	100%	2.E-01	Immune System, Hematological			
			Sum:	**2.E+00**		**Sum:**	**5.E-02**	

TABLE B-4
AOC-7: SOUTHERN DIE STORAGE PAD AREA - TARGET ORGAN SUMMARY
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total Noncancer Hazard Ratio	Ingestion/Dermal			Inhalation		
			Noncancer Hazard Ratio - Ingestion/ Dermal (Percent)	Noncancer Hazard Ratio - Ingestion/ Dermal	Target Endpoint - Ingestion/Dermal	Noncancer Hazard Ratio - Inhalation	Noncancer Inhalation Hazard Ratio	Target Endpoint - Inhalation
75-35-4	1,1-Dichloroethene	6.E-05	2%	1.E-06	Liver	98%	6.E-05	Liver
120-82-1	1,2,4-Trichlorobenzene	8.E-04	2%	2.E-05	Endocrine - Adrenal	98%	8.E-04	Kidney
78-93-3	2-Butanone (Methyl Ethyl Ketone)	6.E-08	28%	2.E-08	Developmental	72%	4.E-08	Developmental, Musculoskeletal
91-57-6	2-Methylnaphthalene	8.E-05	100%	8.E-05	Respiratory			
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	5.E-09				100%	5.E-09	Developmental, Musculoskeletal
83-32-9	Acenaphthene	2.E-07	100%	2.E-07	Liver			
67-64-1	Acetone	1.E-07	62%	7.E-08	Kidney	38%	4.E-08	Nervous System
98-86-2	Acetophenone	3.E-07	100%	3.E-07	None observed			
7429-90-5	Aluminum	3.E-02	96%	3.E-02	Nervous System	4%	1.E-03	Nervous System
120-12-7	Anthracene	5.E-08	100%	5.E-08	None observed			
11097-69-1	Aroclor-1254 (PCB-1254)	3.E-02	100%	3.E-02	Immune System, Skin, Ocular			
7440-38-2	Arsenic	5.E-02	99%	5.E-02	Skin, Vascular	1%	3.E-04	Developmental, Nervous System
7440-39-3	Barium	9.E-04	93%	8.E-04	Kidney	7%	6.E-05	Developmental
50-32-8	Benzo(a)pyrene	7.E-05	98%	7.E-05	Developmental	2%	1.E-06	Developmental
191-24-2	Benzo(g,h,i)perylene	5.E-06	100%	5.E-06	Kidney			
7440-41-7	Beryllium	2.E-03	98%	2.E-03	Gastrointestinal	2%	5.E-05	Immune System, Respiratory
92-52-4	Biphenyl	1.E-03	0%	4.E-07	Kidney	100%	1.E-03	Respiratory, Liver, Kidney
117-81-7	bis(2-Ethylhexyl)phthalate	9.E-05	100%	9.E-05	Liver			
7440-43-9	Cadmium	3.E-03	98%	3.E-03	Kidney	2%	5.E-05	Kidney
75-15-0	Carbon disulfide	8.E-07	3%	2.E-08	Developmental	97%	7.E-07	Nervous System
7440-47-3	Chromium	1.E-03	100%	1.E-03	None observed			
156-59-2	cis-1,2-Dichloroethene	2.E-03	100%	2.E-03	Kidney			
7440-50-8	Copper	4.E-01	100%	4.E-01	Gastrointestinal			
132-64-9	Dibenzofuran	2.E-04	100%	2.E-04	General Toxicity - Growth			
131-11-3	Dimethyl phthalate	8.E-07	100%	8.E-07	General Toxicity - Growth			
84-74-2	Di-n-butylphthalate	2.E-07	100%	2.E-07	General Toxicity - Mortality			
100-41-4	Ethylbenzene	1.E-07	17%	2.E-08	Liver, Kidney	83%	1.E-07	Developmental
206-44-0	Fluoranthene	2.E-06	100%	2.E-06	Kidney, Liver			
86-73-7	Fluorene	4.E-07	100%	4.E-07	Hematological			
118-74-1	Hexachlorobenzene	5.E-03	100%	5.E-03	Liver			
7439-96-5	Manganese	6.E-02	91%	6.E-02	Nervous System	9%	5.E-03	Nervous System
7439-97-6	Mercury	3.E-03				100%	3.E-03	Nervous System
108-87-2	Methyl cyclohexane	2.E-08				100%	2.E-08	Developmental
75-09-2	Methylene chloride	8.E-07	45%	4.E-07	Liver	55%	4.E-07	Liver
91-20-3	Naphthalene	3.E-04	4%	1.E-05	General Toxicity - Growth	96%	3.E-04	Respiratory
7440-02-0	Nickel	4.E-01	96%	4.E-01	General Toxicity - Growth	4%	2.E-02	Respiratory
85-01-8	Phenanthrene	9.E-06	100%	9.E-06	Kidney			
129-00-0	Pyrene	3.E-06	100%	3.E-06	Kidney			
7782-49-2	Selenium	5.E-04	99.995%	5.E-04	Nervous System, Hematological, Skin	0.005%	3.E-08	Nervous system, Hematological, Skin
7440-22-4	Silver	7.E-04	100%	7.E-04	Skin			
127-18-4	Tetrachloroethene	3.E-05	6%	2.E-06	Nervous System, Ocular	94%	3.E-05	Nervous System, Ocular
7440-28-0	Thallium	2.E-01	100%	2.E-01	Dermal - Hair			
108-88-3	Toluene	1.E-06	50%	7.E-07	Kidney	50%	7.E-07	Nervous System
156-60-5	trans-1,2-Dichloroethene	7.E-06	100%	7.E-06	Immune system			
79-01-6	Trichloroethene	8.E-01	3%	3.E-02	Developmental, Immune System	97%	8.E-01	Developmental, Immune System
75-01-4	Vinyl chloride	1.E-04	11%	1.E-05	Liver	89%	9.E-05	Liver
1330-20-7	Xylene (total)	2.E-05	1%	2.E-07	General Toxicity - Growth, Mortality	99%	2.E-05	Nervous System
7440-66-6	Zinc	3.E-01	100%	3.E-01	Immune System, Hematological			
			Sum:	**1.E+00**		**Sum:**	**8.E-01**	

TABLE C-1
AOC-2: NORTHERN SLUDGE AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3
7440-28-0	Thallium	8.E-01	100%		8.E-01		Dermal - Hair		8.E-01
7440-62-2	Vanadium	5.E-03	99%	1%	5.E-03	5.E-05	Dermal - Hair	Respiratory	5.E-03
	Dermal - Hair	**8.E-01**							**8.E-01 Dermal - Hair**
7440-38-2	Arsenic	6.E-02	99%	1%	6.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	3.E-04
7440-39-3	Barium	1.E-03	93%	7%	9.E-04	7.E-05	Kidney	Developmental	7.E-05
50-32-8	Benzo(a)pyrene	7.E-05	98%	2%	7.E-05	1.E-06	Developmental	Developmental	7.E-05
75-15-0	Carbon disulfide	4.E-07	3%	97%	1.E-08	4.E-07	Developmental	Nervous System	1.E-08
79-01-6	Trichloroethene	5.E-05	3%	97%	2.E-06	5.E-05	Developmental, Immune System	Developmental, Immune System	5.E-05
	Developmental	**6.E-02**							**5.E-04 Developmental**
57-12-5	Cyanide	1.E+00	21%	79%	2.E-01	7.E-01	Reproductive	Endocrine - Thyroid	7.E-01
7440-48-4	Cobalt	3.E-02	99%	1%	3.E-02	3.E-04	Endocrine - Thyroid	Respiratory	3.E-02
	Endocrine - Thyroid	**1.E+00**							**8.E-01 Endocrine - Thyroid**
7440-41-7	Beryllium	4.E-04	98%	2%	4.E-04	8.E-06	Gastrointestinal	Immune System, Respiratory	4.E-04
7440-50-8	Copper	1.E-01	100%		1.E-01		Gastrointestinal		1.E-01
	Gastrointestinal	**1.E-01**							**1.E-01 Gastrointestinal**
132-64-9	Dibenzofuran	2.E-05	100%		2.E-05		General Toxicity - Growth		2.E-05
91-20-3	Naphthalene	1.E-04	4%	96%	4.E-06	1.E-04	General Toxicity - Growth	Respiratory	4.E-06
7440-02-0	Nickel	6.E-01	96%	4%	6.E-01	2.E-02	General Toxicity - Growth	Respiratory	6.E-01
	General Toxicity - Growth	**6.E-01**							**6.E-01 General Toxicity - Growth**
84-74-2	Di-n-butylphthalate	3.E-07	100%		3.E-07		General Toxicity - Mortality		3.E-07
7440-36-0	Antimony	7.E-01	99.97%	0.03%	7.E-01	2.E-04	General Toxicity - Mortality, Hematological	Respiratory	7.E-01
	General Toxicity - Mortality	**7.E-01**							**7.E-01 General Toxicity - Mortality**
7440-41-7	Beryllium	4.E-04	98%	2%	4.E-04	8.E-06	Gastrointestinal	Immune System, Respiratory	8.E-06
79-01-6	Trichloroethene	5.E-05	3%	97%	2.E-06	5.E-05	Developmental, Immune System	Developmental, Immune System	5.E-05
7440-66-6	Zinc	8.E-03	100%		8.E-03		Immune System, Hematological		8.E-03
	Immune System	**8.E-03**							**8.E-03 Immune System**
7440-36-0	Antimony	7.E-01	99.97%	0.03%	7.E-01	2.E-04	General Toxicity - Mortality, Hematological	Respiratory	7.E-01
7782-49-2	Selenium	6.E-04	99.995%	0.005%	6.E-04	3.E-08	Nervous System, Hematological, Skin	Nervous system, Hematological, Skin	6.E-04
7440-66-6	Zinc	8.E-03	100%		8.E-03		Immune System, Hematological		8.E-03
	Hematological	**8.E-01**							**8.E-01 Hematological**
7440-39-3	Barium	1.E-03	93%	7%	9.E-04	7.E-05	Kidney	Developmental	9.E-04
191-24-2	Benzo(g,h,i)perylene	7.E-07	100%		7.E-07		Kidney		7.E-07
7440-43-9	Cadmium	2.E-02	98%	2%	2.E-02	4.E-04	Kidney	Kidney	2.E-02
85-01-8	Phenanthrene	1.E-06	100%		1.E-06		Kidney		1.E-06
129-00-0	Pyrene	1.E-06	100%		1.E-06		Kidney		1.E-06
206-44-0	Fluoranthene	1.E-06	100%		1.E-06		Kidney, Liver		1.E-06
	Kidney	**2.E-02**							**2.E-02 Kidney**

TABLE C-1
AOC-2: NORTHERN SLUDGE AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3
117-81-7	bis(2-Ethylhexyl)phthalate	2.E-04	100%		2.E-04		Liver		2.E-04
206-44-0	Fluoranthene	1.E-06	100%		1.E-06		Kidney, Liver		1.E-06
75-09-2	Methylene chloride	1.E-05	45%	55%	5.E-06	6.E-06	Liver		1.E-05
79-20-9	Methyl Acetate	2.E-08	100%		2.E-08		Liver, Cardiovascular, Brain		2.E-08
	Liver	**2.E-04**							**2.E-04 Liver**
7440-38-2	Arsenic	6.E-02	99%	1%	6.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	3.E-04
7429-90-5	Aluminum	2.E-02	96%	4%	2.E-02	8.E-04	Nervous System	Nervous System	2.E-02
75-15-0	Carbon disulfide	4.E-07	3%	97%	1.E-08	4.E-07	Developmental	Nervous System	4.E-07
7439-96-5	Manganese	6.E-02	91%	9%	5.E-02	5.E-03	Nervous System	Nervous System	6.E-02
7439-97-6	Mercury	1.E-02		100%		1.E-02		Nervous System	1.E-02
79-20-9	Methyl Acetate	2.E-08	100%		2.E-08		Liver, Cardiovascular, Nervous System		2.E-08
7782-49-2	Selenium	6.E-04	99.995%	0.005%	6.E-04	3.E-08	Nervous System, Hematological, Skin	Nervous system, Hematological, Skin	6.E-04
	Nervous System	**1.E-01**							**9.E-02 Nervous System**
57-12-5	Cyanide	1.E+00	21%	79%	2.E-01	7.E-01	Reproductive	Endocrine - Thyroid	2.E-01
	Reproductive	**1.E+00**							**2.E-01 Reproductive**
91-57-6	2-Methylnaphthalene	3.E-05	100%		3.E-05		Respiratory		3.E-05
7440-36-0	Antimony	7.E-01	99.97%	0.03%	7.E-01	2.E-04	General Toxicity - Mortality, Hematological	Respiratory	2.E-04
7440-41-7	Beryllium	4.E-04	98%	2%	4.E-04	8.E-06	Gastrointestinal	Immune System, Respiratory	8.E-06
18540-29-9	Chromium VI (Hexavalent)	4.E-03	99%	1%	4.E-03	2.E-05	None observed	Respiratory	2.E-05
7440-48-4	Cobalt	3.E-02	99%	1%	3.E-02	3.E-04	Endocrine - Thyroid	Respiratory	3.E-04
91-20-3	Naphthalene	1.E-04	4%	96%	4.E-06	1.E-04	General Toxicity - Growth	Respiratory	1.E-04
7440-02-0	Nickel	6.E-01	96%	4%	6.E-01	2.E-02	General Toxicity - Growth	Respiratory	2.E-02
7440-62-2	Vanadium	5.E-03	99%	1%	5.E-03	5.E-05	Dermal - Hair	Respiratory	5.E-05
	Respiratory	**1.E+00**							**3.E-02 Respiratory**
7440-38-2	Arsenic	6.E-02	99%	1%	6.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	6.E-02
7782-49-2	Selenium	6.E-04	99.995%	0.005%	6.E-04	3.E-08	Nervous System, Hematological, Skin	Nervous system, Hematological, Skin	6.E-04
7440-22-4	Silver	1.E-03	100%		1.E-03		Skin		1.E-03
	Skin	**6.E-02**							**6.E-02 Skin**
7440-38-2	Arsenic	6.E-02	99%	1%	6.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	6.E-02
79-20-9	Methyl Acetate	2.E-08	100%		2.E-08		Liver, Cardiovascular, Brain		2.E-08
	Vascular/ Cardiovascular	**6.E-02**							**6.E-02 Vascular/ Cardiovascular**
7440-47-3	Chromium	2.E-02	100%		2.E-02		None observed		2.E-02
18540-29-9	Chromium VI (Hexavalent)	4.E-03	99%	1%	4.E-03	2.E-05	None observed	Respiratory	4.E-03

Notes
1. Total Hazard Index (HI) undifferentiated by route: the total HI value is calculated assuming that all exposure routes (ingestion/dermal and inhalation) could result in risk to the same target organ.
2. Total Hazard Index (HI) route-specific: the total HI value is calculated assuming that risk to a target organ is apportioned according to the route for which the target endpoint is the target organ being evaluated.
3. Yellow shading indicates HI values undifferentiated by exposure route that do not equal HI values that are exposure route-specific.

TABLE C-2
AOC-5: SOUTHERN TRENCHES AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
79-20-9	Methyl acetate	8.E-07	100%		8.E-07		Liver, Cardiovascular, Brain		8.E-07	
	Cardiovascular	**8.E-07**							**8.E-07**	**Cardiovascular**
7440-28-0	Thallium	2.E-01	100%		2.E-01		Dermal - Hair		2.E-01	
	Dermal - Hair	**2.E-01**							**2.E-01**	**Dermal - Hair**
78-93-3	2-Butanone (Methyl Ethyl Ketone)	4.E-06	28%	72%	1.E-06	3.E-06	Developmental	Developmental, Musculoskeletal	4.E-06	
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	2.E-06		100%		2.E-06		Developmental, Musculoskeletal	2.E-06	
7440-39-3	Barium	5.E-04	93%	7%	5.E-04	4.E-05	Kidney	Developmental	4.E-05	
75-15-0	Carbon disulfide	2.E-06	3%	97%	5.E-08	2.E-06	Developmental	Nervous System	5.E-08	
110-82-7	Cyclohexane	5.E-06		100%		5.E-06		Developmental	5.E-06	
50-32-8	Benzo(a)pyrene	3.E-04	98%	2%	2.E-04	5.E-06	Developmental	Developmental	3.E-04	
100-41-4	Ethylbenzene	2.E-05	17%	83%	4.E-06	2.E-05	Liver, Kidney	Developmental	2.E-05	
108-87-2	Methyl cyclohexane	2.E-06		100%		2.E-06		Developmental	2.E-06	
79-01-6	Trichloroethene	5.E-02	3%	97%	1.E-03	5.E-02	Developmental, Immune System	Developmental, Immune System	5.E-02	
	Developmental	**5.E-02**							**5.E-02**	**Developmental**
120-82-1	1,2,4-Trichlorobenzene	7.E-04	2%	98%	1.E-05	7.E-04	Endocrine - Adrenal	Kidney	1.E-05	
98-82-8	Isopropylbenzene (Cumene)	1.E-05	8%	92%	1.E-06	1.E-05	Kidney	Endocrine - Adrenal, Kidney	1.E-05	
	Endocrine - Adrenal	**7.E-04**							**3.E-05**	**Endocrine - Adrenal**
7440-41-7	Beryllium	4.E-04	98%	2%	4.E-04	7.E-06	Gastrointestinal	Immune System, Respiratory	4.E-04	
7440-50-8	Copper	8.E-02	100%		8.E-02		Gastrointestinal		8.E-02	
	Gastrointestinal	**8.E-02**							**8.E-02**	**Gastrointestinal**
95-50-1	1,2-Dichlorobenzene	1.E-05	8%	92%	8.E-07	9.E-06	None observed	General Toxicity - Growth	9.E-06	
132-64-9	Dibenzofuran	4.E-05	100%		4.E-05		General Toxicity - Growth		4.E-05	
91-20-3	Naphthalene	4.E-04	4%	96%	1.E-05	3.E-04	General Toxicity - Growth	Respiratory	1.E-05	
7440-02-0	Nickel	7.E-02	96%	4%	7.E-02	3.E-03	General Toxicity - Growth	Respiratory	7.E-02	
1330-20-7	Xylene (total)	8.E-04	1%	99%	9.E-06	8.E-04	General Toxicity - Growth, Mortality	Nervous System	9.E-06	
	General Toxicity - Growth	**7.E-02**							**7.E-02**	**General Toxicity - Growth**
1330-20-7	Xylene (total)	8.E-04	1%	99%	9.E-06	8.E-04	General Toxicity - Growth, Mortality	Nervous System	9.E-06	
	General Toxicity - Mortality	**8.E-04**							**9.E-06**	**General Toxicity - Mortality**
86-73-7	Fluorene	2.E-06	100%		2.E-06		Hematological		2.E-06	
7440-66-6	Zinc	2.E-02	100%		2.E-02		Immune System, Hematological		2.E-02	
	Hematological	**2.E-02**							**2.E-02**	**Hematological**
11097-69-1	Aroclor-1254 (PCB-1254)	9.E-01	100%		9.E-01		Immune System, Skin, Ocular		9.E-01	
71-43-2	Benzene	8.E-03	9%	91%	7.E-04	7.E-03	Immune System	Immune System	8.E-03	
7440-41-7	Beryllium	4.E-04	98%	2%	4.E-04	7.E-06	Gastrointestinal	Immune System, Respiratory	7.E-06	
156-60-5	trans-1,2-Dichloroethene	2.E-06	100%		2.E-06		Immune system		2.E-06	
79-01-6	Trichloroethene	5.E-02	3%	97%	1.E-03	5.E-02	Developmental, Immune System	Developmental, Immune System	5.E-02	
7440-66-6	Zinc	2.E-02	100%		2.E-02		Immune System, Hematological		2.E-02	
	Immune System	**1.E+00**							**1.E+00**	**Immune System**

TABLE C-2
AOC-5: SOUTHERN TRENCHES AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
75-34-3	1,1-Dichloroethane	2.E-09	100%		2.E-09		Kidney		2.E-09	
120-82-1	1,2,4-Trichlorobenzene	7.E-04	2%	98%	1.E-05	7.E-04	Endocrine - Adrenal	Kidney	7.E-04	
67-64-1	Acetone	2.E-07	62%	38%	1.E-07	8.E-08	Kidney	Nervous System	1.E-07	
7440-39-3	Barium	5.E-04	93%	7%	5.E-04	4.E-05	Kidney	Developmental	5.E-04	
191-24-2	Benzo(g,h,i)perylene	2.E-06	100%		2.E-06		Kidney		2.E-06	
92-52-4	Biphenyl	1.E-03	0.03%	99.97%	4.E-07	1.E-03	Kidney	Respiratory, Liver, Kidney	1.E-03	
7440-43-9	Cadmium	6.E-04	98%	2%	5.E-04	9.E-06	Kidney	Kidney	6.E-04	
156-59-2	cis-1,2-Dichloroethene	9.E-05	100%		9.E-05		Kidney		9.E-05	
108-90-7	Chlorobenzene	2.E-05	6%	94%	1.E-06	2.E-05	Liver	Kidney, Liver	2.E-05	
100-41-4	Ethylbenzene	2.E-05	17%	83%	4.E-06	2.E-05	Liver, Kidney	Developmental	4.E-06	
206-44-0	Fluoranthene	4.E-06	100%		4.E-06		Kidney, Liver		4.E-06	
98-82-8	Isopropylbenzene (Cumene)	1.E-05	8%	92%	1.E-06	1.E-05	Kidney	Endocrine - Adrenal, Kidney	1.E-05	
85-01-8	Phenanthrene	1.E-05	100%		1.E-05		Kidney		1.E-05	
129-00-0	Pyrene	7.E-06	100%		7.E-06		Kidney		7.E-06	
108-88-3	Toluene	2.E-04	50%	50%	1.E-04	9.E-05	Kidney	Nervous System	1.E-04	
	Kidney	**3.E-03**							**3.E-03**	**Kidney**
75-35-4	1,1-Dichloroethene	7.E-05	2%	98%	1.E-06	7.E-05	Liver	Liver	7.E-05	
541-73-1	1,3-Dichlorobenzene	8.E-08	31%	69%	2.E-08	6.E-08	Liver	Liver	8.E-08	
106-46-7	1,4-Dichlorobenzene	3.E-08	31%	69%	9.E-09	2.E-08	Liver	Liver	3.E-08	
92-52-4	Biphenyl	1.E-03	0.03%	99.97%	4.E-07	1.E-03	Kidney	Respiratory, Liver, Kidney	1.E-03	
117-81-7	bis(2-Ethylhexyl)phthalate	8.E-05	100%		8.E-05		Liver		8.E-05	
108-90-7	Chlorobenzene	2.E-05	6%	94%	1.E-06	2.E-05	Liver	Kidney, Liver	2.E-05	
100-41-4	Ethylbenzene	2.E-05	17%	83%	4.E-06	2.E-05	Liver, Kidney	Developmental	4.E-06	
206-44-0	Fluoranthene	4.E-06	100%		4.E-06		Kidney, Liver		4.E-06	
118-74-1	Hexachlorobenzene	6.E-05	100%		6.E-05		Liver		6.E-05	
75-01-4	Vinyl chloride	2.E-04	11%	89%	2.E-05	2.E-04	Liver	Liver	2.E-04	
79-20-9	Methyl acetate	8.E-07	100%		8.E-07		Liver, Cardiovascular, Brain		8.E-07	
	Liver	**2.E-03**							**2.E-03**	**Liver**
591-78-6	2-Hexanone	1.E-04	23%	77%	3.E-05	1.E-04	Nervous System	Nervous System	1.E-04	
67-64-1	Acetone	2.E-07	62%	38%	1.E-07	8.E-08	Kidney	Nervous System	8.E-08	
75-15-0	Carbon disulfide	2.E-06	3%	97%	5.E-08	2.E-06	Developmental	Nervous System	2.E-06	
7439-96-5	Manganese	3.E-01	91%	9%	3.E-01	3.E-02	Nervous System	Nervous System	3.E-01	
7439-97-6	Mercury	1.E-03		100%		1.E-03		Nervous System	1.E-03	
79-20-9	Methyl acetate	8.E-07	100%		8.E-07		Liver, Cardiovascular, Brain		8.E-07	
127-18-4	Tetrachloroethene	1.E-06	6%	94%	7.E-08	1.E-06	Nervous System, Ocular	Nervous System, Ocular	1.E-06	
108-88-3	Toluene	2.E-04	50%	50%	1.E-04	9.E-05	Kidney	Nervous System	9.E-05	
1330-20-7	Xylene (total)	8.E-04	1%	99%	9.E-06	8.E-04	General Toxicity - Growth, Mortality	Nervous System	8.E-04	
	Nervous System	**3.E-01**							**3.E-01**	**Nervous System**
78-93-3	2-Butanone (Methyl Ethyl Ketone)	4.E-06	28%	72%	1.E-06	3.E-06	Developmental	Developmental, Musculoskeletal	3.E-06	
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	2.E-06		100%		2.E-06		Developmental, Musculoskeletal	2.E-06	
	Musculoskeletal	**6.E-06**							**5.E-06**	**Musculoskeletal**
11097-69-1	Aroclor-1254 (PCB-1254)	9.E-01	100%		9.E-01		Immune System, Skin, Ocular		9.E-01	
127-18-4	Tetrachloroethene	1.E-06	6%	94%	7.E-08	1.E-06	Nervous System, Ocular	Nervous System, Ocular	1.E-06	
	Ocular	**9.E-01**							**9.E-01**	**Ocular**

TABLE C-2
AOC-5: SOUTHERN TRENCHES AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
91-57-6	2-Methylnaphthalene	1.E-04	100%		1.E-04		Respiratory		1.E-04	
7440-41-7	Beryllium	4.E-04	98%	2%	4.E-04	7.E-06	Gastrointestinal	Immune System, Respiratory	7.E-06	
92-52-4	Biphenyl	1.E-03	0.03%	99.97%	4.E-07	1.E-03	Kidney	Respiratory, Liver, Kidney	1.E-03	
91-20-3	Naphthalene	4.E-04	4%	96%	1.E-05	3.E-04	General Toxicity - Growth	Respiratory	3.E-04	
7440-02-0	Nickel	7.E-02	96%	4%	7.E-02	3.E-03	General Toxicity - Growth	Respiratory	3.E-03	
	Respiratory	**7.E-02**							**4.E-03**	**Respiratory**
11097-69-1	Aroclor-1254 (PCB-1254)	9.E-01	100%		9.E-01		Immune System, Skin, Ocular		9.E-01	
	Skin	**9.E-01**							**9.E-01**	**Skin**
95-50-1	1,2-Dichlorobenzene	1.E-05	8%	92%	8.E-07	9.E-06	None observed	General Toxicity - Growth	8.E-07	
120-12-7	Anthracene	1.E-07	100%		1.E-07		None observed		1.E-07	
7440-47-3	Chromium	2.E-03	100%		2.E-03		None observed		2.E-03	

Notes
1. Total Hazard Index (HI) undifferentiated by route: the total HI value is calculated assuming that all exposure routes (ingestion/dermal and inhalation) could result in risk to the same target organ.
2. Total Hazard Index (HI) route-specific: the total HI value is calculated assuming that risk to a target organ is apportioned according to the route for which the target endpoint is the target organ being evaluated.
3. Yellow shading indicates HI values undifferentiated by exposure route that do not equal HI values that are exposure route-specific.

TABLE C-3
AOC-6: NORTHERN DIE STORAGE PAD AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
78-93-3	2-Butanone (Methyl Ethyl Ketone)	2.E-07	28%	72%	5.E-08	1.E-07	Developmental	Developmental, Musculoskeletal	2.E-07	
7440-39-3	Barium	3.E-03	93%	7%	3.E-03	2.E-04	Kidney	Developmental	2.E-04	
75-15-0	Carbon disulfide	8.E-07	3%	97%	2.E-08	7.E-07	Developmental	Nervous System	2.E-08	
110-82-7	Cyclohexane	2.E-08		100%		2.E-08		Developmental	2.E-08	
100-41-4	Ethylbenzene	9.E-08	17%	83%	1.E-08	7.E-08	Liver, Kidney	Developmental	7.E-08	
108-87-2	Methyl cyclohexane	2.E-08		100%		2.E-08		Developmental	2.E-08	
79-01-6	Trichloroethene	8.E-05	3%	97%	3.E-06	8.E-05	Developmental, Immune System	Developmental, Immune System	8.E-05	
	Developmental	**3.E-03**							**3.E-04**	**Developmental**
7440-48-4	Cobalt	7.E-02	99%	1%	7.E-02	6.E-04	Endocrine - Thyroid	Respiratory	7.E-02	
	Endocrine - Thyroid	**7.E-02**							**7.E-02**	**Endocrine - Thyroid**
100-52-7	Benzaldehyde	2.E-06	100%		2.E-06		Gastrointestinal, Kidney		2.E-06	
7440-50-8	Copper	8.E-01	100%		8.E-01		Gastrointestinal		8.E-01	
	Gastrointestinal	**8.E-01**							**8.E-01**	**Gastrointestinal**
95-50-1	1,2-Dichlorobenzene	4.E-08	8%	92%	3.E-09	3.E-08	None observed	General Toxicity - Growth	3.E-08	
95-48-7	2-Methylphenol (o-Cresol)	4.E-06	99.999%	0.001%	4.E-06	5.E-11	Nervous System, General Toxicity - Growth	Nervous System	4.E-06	
3/4-CRESOL	3&4-Methylphenol	2.E-05	100%	0%	2.E-05	2.E-10	Nervous System, General Toxicity - Growth	Nervous System	2.E-05	
132-64-9	Dibenzofuran	3.E-04	100%		3.E-04		General Toxicity - Growth		3.E-04	
91-20-3	Naphthalene	2.E-03	4%	96%	9.E-05	2.E-03	General Toxicity - Growth	Respiratory	9.E-05	
7440-02-0	Nickel	1.E+00	96%	4%	9.E-01	4.E-02	General Toxicity - Growth	Respiratory	9.E-01	
108-95-2	Phenol	5.E-07	99.98%	0.02%	5.E-07	1.E-10	General Toxicity - Growth	Liver, Nervous System	5.E-07	
1330-20-7	Xylene (total)	3.E-06	1%	99%	3.E-08	3.E-06	General Toxicity - Growth, Mortality	Nervous System	3.E-08	
	General Toxicity - Growth	**1.E+00**							**9.E-01**	**General Toxicity - Growth**
1330-20-7	Xylene (total)	3.E-06	1%	99%	3.E-08	3.E-06	General Toxicity - Growth, Mortality	Nervous System	3.E-08	
	General Toxicity - Mortality	**3.E-06**							**3.E-08**	**General Toxicity - Mortality**
105-67-9	2,4-Dimethylphenol	1.E-05	100%		1.E-05		Nervous System, Hematological		1.E-05	
86-73-7	Fluorene	3.E-06	100%		3.E-06		Hematological		3.E-06	
7440-66-6	Zinc	2.E-01	100%		2.E-01		Immune System, Hematological		2.E-01	
	Hematological	**2.E-01**							**2.E-01**	**Hematological**
120-83-2	2,4-Dichlorophenol	6.E-05	100%		6.E-05		Immune System		6.E-05	
11097-69-1	Aroclor-1254 (PCB-1254)	5.E-03	100%		5.E-03		Immune System, Skin, Ocular		5.E-03	
71-43-2	Benzene	5.E-06	9%	91%	4.E-07	4.E-06	Immune System	Immune System	5.E-06	
79-01-6	Trichloroethene	8.E-05	3%	97%	3.E-06	8.E-05	Developmental, Immune System	Developmental, Immune System	8.E-05	
7440-66-6	Zinc	2.E-01	100%		2.E-01		Immune System, Hematological		2.E-01	
	Immune System	**2.E-01**							**2.E-01**	**Immune System**

TABLE C-3
AOC-6: NORTHERN DIE STORAGE PAD AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
67-64-1	Acetone	3.E-07	62%	38%	2.E-07	1.E-07	Kidney	Nervous System	2.E-07	
7440-39-3	Barium	3.E-03	93%	7%	3.E-03	2.E-04	Kidney	Developmental	3.E-03	
100-52-7	Benzaldehyde	2.E-06	100%		2.E-06		Gastrointestinal, Kidney		2.E-06	
92-52-4	Biphenyl	2.E-03	0%	100%	8.E-07	2.E-03	Kidney	Respiratory, Liver, Kidney	2.E-03	
7440-43-9	Cadmium	6.E-03	98%	2%	6.E-03	1.E-04	Kidney	Kidney	6.E-03	
108-90-7	Chlorobenzene	2.E-07	6%	94%	1.E-08	2.E-07	Liver	Kidney, Liver	2.E-07	
156-59-2	cis-1,2-Dichloroethene	4.E-07	100%		4.E-07		Kidney		4.E-07	
100-41-4	Ethylbenzene	9.E-08	17%	83%	1.E-08	7.E-08	Liver, Kidney	Developmental	1.E-08	
85-01-8	Phenanthrene	2.E-05	100%		2.E-05		Kidney		2.E-05	
129-00-0	Pyrene	4.E-06	100%		4.E-06		Kidney		4.E-06	
108-88-3	Toluene	1.E-07	50%	50%	5.E-08	5.E-08	Kidney	Nervous System	5.E-08	
206-44-0	Fluoranthene	8.E-06	100%		8.E-06		Kidney, Liver		8.E-06	
	Kidney	**1.E-02**							**1.E-02**	**Kidney**
541-73-1	1,3-Dichlorobenzene	1.E-08	31%	69%	4.E-09	9.E-09	Liver	Liver	1.E-08	
106-46-7	1,4-Dichlorobenzene	2.E-08	31%	69%	5.E-09	1.E-08	Liver	Liver	2.E-08	
92-52-4	Biphenyl	2.E-03	0%	100%	8.E-07	2.E-03	Kidney	Respiratory, Liver, Kidney	2.E-03	
117-81-7	bis(2-Ethylhexyl)phthalate	2.E-04	100%		2.E-04		Liver		2.E-04	
108-90-7	Chlorobenzene	2.E-07	6%	94%	1.E-08	2.E-07	Liver	Kidney, Liver	2.E-07	
100-41-4	Ethylbenzene	9.E-08	17%	83%	1.E-08	7.E-08	Liver, Kidney	Developmental	1.E-08	
118-74-1	Hexachlorobenzene	5.E-05	100%		5.E-05		Liver		5.E-05	
75-09-2	Methylene chloride	3.E-07	45%	55%	1.E-07	1.E-07	Liver	Liver	3.E-07	
206-44-0	Fluoranthene	8.E-06	100%		8.E-06		Kidney, Liver		8.E-06	
108-95-2	Phenol	5.E-07	99.98%	0.02%	5.E-07	1.E-10	General Toxicity - Growth	Liver, Nervous System	1.E-10	
	Liver	**3.E-03**							**3.E-03**	**Liver**
78-93-3	2-Butanone (Methyl Ethyl Ketone)	2.E-07	28%	72%	5.E-08	1.E-07	Developmental	Developmental, Musculoskeletal	1.E-07	
	Musculoskeletal	**2.E-07**							**1.E-07**	**Musculoskeletal**
591-78-6	2-Hexanone	1.E-06	23%	77%	3.E-07	9.E-07	Nervous System	Nervous System	1.E-06	
95-48-7	2-Methylphenol (o-Cresol)	4.E-06	99.999%	0.001%	4.E-06	5.E-11	Nervous System, General Toxicity - Growth	Nervous System	4.E-06	
3/4-CRESOL	3&4-Methylphenol	2.E-05	100%	0%	2.E-05	2.E-10	Nervous System, General Toxicity - Growth	Nervous System	2.E-05	
105-67-9	2,4-Dimethylphenol	1.E-05	100%		1.E-05		Nervous System, Hematological		1.E-05	
67-64-1	Acetone	3.E-07	62%	38%	2.E-07	1.E-07	Kidney	Nervous System	1.E-07	
75-15-0	Carbon disulfide	8.E-07	3%	97%	2.E-08	7.E-07	Developmental	Nervous System	7.E-07	
7439-96-5	Manganese	6.E-02	91%	9%	6.E-02	5.E-03	Nervous System	Nervous System	6.E-02	
7439-97-6	Mercury	3.E-03		100%		3.E-03		Nervous System	3.E-03	
108-95-2	Phenol	5.E-07	99.98%	0.02%	5.E-07	1.E-10	General Toxicity - Growth	Liver, Nervous System	1.E-10	
108-88-3	Toluene	1.E-07	50%	50%	5.E-08	5.E-08	Kidney	Nervous System	5.E-08	
1330-20-7	Xylene (total)	3.E-06	1%	99%	3.E-08	3.E-06	General Toxicity - Growth, Mortality	Nervous System	3.E-06	
	Nervous System	**6.E-02**							**6.E-02**	**Nervous System**
11097-69-1	Aroclor-1254 (PCB-1254)	5.E-03	100%		5.E-03		Immune System, Skin, Ocular		5.E-03	
	Ocular	**5.E-03**							**5.E-03**	**Ocular**
91-57-6	2-Methylnaphthalene	5.E-05	100%		5.E-05		Respiratory		5.E-05	
92-52-4	Biphenyl	2.E-03	0%	100%	8.E-07	2.E-03	Kidney	Respiratory, Liver, Kidney	2.E-03	
7440-48-4	Cobalt	7.E-02	99%	1%	7.E-02	6.E-04	Endocrine - Thyroid	Respiratory	6.E-04	
91-20-3	Naphthalene	2.E-03	4%	96%	9.E-05	2.E-03	General Toxicity - Growth	Respiratory	2.E-03	
7440-02-0	Nickel	1.E+00	96%	4%	9.E-01	4.E-02	General Toxicity - Growth	Respiratory	4.E-02	
	Respiratory	**1.E+00**							**5.E-02**	**Respiratory**

TABLE C-3
AOC-6: NORTHERN DIE STORAGE PAD AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3
11097-69-1	Aroclor-1254 (PCB-1254)	5.E-03	100%		5.E-03		Immune System, Skin, Ocular		5.E-03
7440-22-4	Silver	1.E-03	100%		1.E-03		Skin		1.E-03
	Skin	**6.E-03**							**6.E-03 Skin**
95-50-1	1,2-Dichlorobenzene	4.E-08	8%	92%	3.E-09	3.E-08	None observed	General Toxicity - Growth	3.E-09
98-86-2	Acetophenone	3.E-06	100%		3.E-06		None observed		3.E-06
120-12-7	Anthracene	2.E-07	100%		2.E-07		None observed		2.E-07
7440-47-3	Chromium	6.E-04	100%		6.E-04		None observed		6.E-04

Notes
1. Total Hazard Index (HI) undifferentiated by route: the total HI value is calculated assuming that all exposure routes (ingestion/dermal and inhalation) could result in risk to the same target organ.
2. Total Hazard Index (HI) route-specific: the total HI value is calculated assuming that risk to a target organ is apportioned according to the route for which the target endpoint is the target organ being evaluated.
3. Yellow shading indicates HI values undifferentiated by exposure route that do not equal HI values that are exposure route-specific.

TABLE C-4
AOC-7: SOUTHERN DIE STORAGE PAD AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/ Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
7440-28-0	Thallium	2.E-01	100%		2.E-01		Dermal - Hair		2.E-01	
	Dermal - Hair	**2.E-01**							**2.E-01**	**Dermal - Hair**
78-93-3	2-Butanone (Methyl Ethyl Ketone)	6.E-08	28%	72%	2.E-08	4.E-08	Developmental	Developmental, Musculoskeletal	6.E-08	
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	5.E-09		100%		5.E-09		Developmental, Musculoskeletal	5.E-09	
7440-38-2	Arsenic	5.E-02	99%	1%	5.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	3.E-04	
7440-39-3	Barium	9.E-04	93%	7%	8.E-04	6.E-05	Kidney	Developmental	6.E-05	
50-32-8	Benzo(a)pyrene	7.E-05	98%	2%	7.E-05	1.E-06	Developmental	Developmental	7.E-05	
75-15-0	Carbon disulfide	8.E-07	3%	97%	2.E-08	7.E-07	Developmental	Nervous System	2.E-08	
100-41-4	Ethylbenzene	1.E-07	17%	83%	2.E-08	1.E-07	Liver, Kidney	Developmental	1.E-07	
108-87-2	Methyl cyclohexane	2.E-08		100%		2.E-08		Developmental	2.E-08	
79-01-6	Trichloroethene	8.E-01	3%	97%	3.E-02	8.E-01	Developmental, Immune System	Developmental, Immune System	8.E-01	
	Developmental	**9.E-01**							**8.E-01**	**Developmental**
120-82-1	1,2,4-Trichlorobenzene	8.E-04	2%	98%	2.E-05	8.E-04	Endocrine - Adrenal	Kidney	2.E-05	
	Endocrine - Adrenal	**8.E-04**							**2.E-05**	**Endocrine - Adrenal**
7440-41-7	Beryllium	2.E-03	98%	2%	2.E-03	5.E-05	Gastrointestinal	Immune System, Respiratory	2.E-03	
7440-50-8	Copper	4.E-01	100%		4.E-01		Gastrointestinal		4.E-01	
	Gastrointestinal	**4.E-01**							**4.E-01**	**Gastrointestinal**
132-64-9	Dibenzofuran	2.E-04	100%		2.E-04		General Toxicity - Growth		2.E-04	
131-11-3	Dimethyl phthalate	8.E-07	100%		8.E-07		General Toxicity - Growth		8.E-07	
91-20-3	Naphthalene	3.E-04	4%	96%	1.E-05	3.E-04	General Toxicity - Growth	Respiratory	1.E-05	
7440-02-0	Nickel	4.E-01	96%	4%	4.E-01	2.E-02	General Toxicity - Growth	Respiratory	4.E-01	
1330-20-7	Xylene (total)	2.E-05	1%	99%	2.E-07	2.E-05	General Toxicity - Growth, Mortality	Nervous System	2.E-07	
	General Toxicity - Growth	**4.E-01**							**4.E-01**	**General Toxicity - Growth**
84-74-2	Di-n-butylphthalate	2.E-07	100%		2.E-07		General Toxicity - Mortality		2.E-07	
1330-20-7	Xylene (total)	2.E-05	1%	99%	2.E-07	2.E-05	General Toxicity - Growth, Mortality	Nervous System	2.E-07	
	General Toxicity - Mortality	**2.E-05**							**5.E-07**	**General Toxicity - Mortality**
86-73-7	Fluorene	4.E-07	100%		4.E-07		Hematological		4.E-07	
7782-49-2	Selenium	5.E-04	99.995%	0.005%	5.E-04	3.E-08	Nervous System, Hematological, Skin	Nervous system, Hematological, Skin	5.E-04	
7440-66-6	Zinc	3.E-01	100%		3.E-01		Immune System, Hematological		3.E-01	
	Hematological	**3.E-01**							**3.E-01**	**Hematological**
11097-69-1	Aroclor-1254 (PCB-1254)	3.E-02	100%		3.E-02		Immune System, Skin, Ocular		3.E-02	
7440-41-7	Beryllium	2.E-03	98%	2%	2.E-03	5.E-05	Gastrointestinal	Immune System, Respiratory	5.E-05	
156-60-5	trans-1,2-Dichloroethene	7.E-06	100%		7.E-06		Immune system		7.E-06	
79-01-6	Trichloroethene	8.E-01	3%	97%	3.E-02	8.E-01	Developmental, Immune System	Developmental, Immune System	8.E-01	
7440-66-6	Zinc	3.E-01	100%		3.E-01		Immune System, Hematological		3.E-01	
	Immune System	**1.E+00**							**1.E+00**	**Immune System**
120-82-1	1,2,4-Trichlorobenzene	8.E-04	2%	98%	2.E-05	8.E-04	Endocrine - Adrenal	Kidney	8.E-04	
67-64-1	Acetone	1.E-07	62%	38%	7.E-08	4.E-08	Kidney	Nervous System	7.E-08	
7440-39-3	Barium	9.E-04	93%	7%	8.E-04	6.E-05	Kidney	Developmental	8.E-04	
191-24-2	Benzo(g,h,i)perylene	5.E-06	100%		5.E-06		Kidney		5.E-06	
92-52-4	Biphenyl	1.E-03	0%	100%	4.E-07	1.E-03	Kidney	Respiratory, Liver, Kidney	1.E-03	
7440-43-9	Cadmium	3.E-03	98%	2%	3.E-03	5.E-05	Kidney	Kidney	3.E-03	
156-59-2	cis-1,2-Dichloroethene	2.E-03	100%		2.E-03		Kidney		2.E-03	
100-41-4	Ethylbenzene	1.E-07	17%	83%	2.E-08	1.E-07	Liver, Kidney	Developmental	2.E-08	
85-01-8	Phenanthrene	9.E-06	100%		9.E-06		Kidney		9.E-06	
129-00-0	Pyrene	3.E-06	100%		3.E-06		Kidney		3.E-06	
108-88-3	Toluene	1.E-06	50%	50%	7.E-07	7.E-07	Kidney	Nervous System	7.E-07	
206-44-0	Fluoranthene	2.E-06	100%		2.E-06		Kidney, Liver		2.E-06	
	Kidney	**8.E-03**							**8.E-03**	**Kidney**

TABLE C-4
AOC-7: SOUTHERN DIE STORAGE PAD AREA - TARGET ORGAN EVALUATION
RACER ELYRIA
ELYRIA, OHIO

CAS Number	COC	Total HI by Target Organ (Undifferentiated by Route) Notes 1,3	Noncancer Hazard Ratio - Ingestion/ Dermal (Percent)	Noncancer Hazard Ratio - Inhalation	Noncancer Hazard Ratio - Ingestion/ Dermal	Noncancer Inhalation Hazard Ratio	Target Endpoint - Ingestion/Dermal	Target Endpoint - Inhalation	Total HI by Target Organ (Route-Specific) Notes 2,3	
75-35-4	1,1-Dichloroethene	6.E-05	2%	98%	1.E-06	6.E-05	Liver	Liver	6.E-05	
83-32-9	Acenaphthene	2.E-07	100%		2.E-07		Liver		2.E-07	
92-52-4	Biphenyl	1.E-03	0%	100%	4.E-07	1.E-03	Kidney	Respiratory, Liver, Kidney	1.E-03	
117-81-7	bis(2-Ethylhexyl)phthalate	9.E-05	100%		9.E-05		Liver		9.E-05	
100-41-4	Ethylbenzene	1.E-07	17%	83%	2.E-08	1.E-07	Liver, Kidney	Developmental	2.E-08	
206-44-0	Fluoranthene	2.E-06	100%		2.E-06		Kidney, Liver		2.E-06	
118-74-1	Hexachlorobenzene	5.E-03	100%		5.E-03		Liver		5.E-03	
75-09-2	Methylene chloride	8.E-07	45%	55%	4.E-07	4.E-07	Liver	Liver	8.E-07	
75-01-4	Vinyl chloride	1.E-04	11%	89%	1.E-05	9.E-05	Liver	Liver	1.E-04	
	Liver	**7.E-03**							**7.E-03**	**Liver**
78-93-3	2-Butanone (Methyl Ethyl Ketone)	6.E-08	28%	72%	2.E-08	4.E-08	Developmental	Developmental, Musculoskeletal	4.E-08	
108-10-1	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	5.E-09		100%		5.E-09		Developmental, Musculoskeletal	5.E-09	
	Musculoskeletal	**6.E-08**							**5.E-08**	**Musculoskeletal**
67-64-1	Acetone	1.E-07	62%	38%	7.E-08	4.E-08	Kidney	Nervous System	4.E-08	
7429-90-5	Aluminum	3.E-02	96%	4%	3.E-02	1.E-03	Nervous System	Nervous System	3.E-02	
7440-38-2	Arsenic	5.E-02	99%	1%	5.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	3.E-04	
75-15-0	Carbon disulfide	8.E-07	3%	97%	2.E-08	7.E-07	Developmental	Nervous System	7.E-07	
7439-96-5	Manganese	6.E-02	91%	9%	6.E-02	5.E-03	Nervous System	Nervous System	6.E-02	
7439-97-6	Mercury	3.E-03		100%		3.E-03		Nervous System	3.E-03	
7782-49-2	Selenium	5.E-04	99.995%	0.005%	5.E-04	3.E-08	Nervous System, Hematological, Skin	Nervous system, Hematological, Skin	5.E-04	
127-18-4	Tetrachloroethene	3.E-05	6%	94%	2.E-06	3.E-05	Nervous System, Ocular	Nervous System, Ocular	3.E-05	
108-88-3	Toluene	1.E-06	50%	50%	7.E-07	7.E-07	Kidney	Nervous System	7.E-07	
1330-20-7	Xylene (total)	2.E-05	1%	99%	2.E-07	2.E-05	General Toxicity - Growth, Mortality	Nervous System	2.E-05	
	Nervous System	**1.E-01**							**9.E-02**	**Nervous System**
11097-69-1	Aroclor-1254 (PCB-1254)	3.E-02	100%		3.E-02		Immune System, Skin, Ocular		3.E-02	
127-18-4	Tetrachloroethene	3.E-05	6%	94%	2.E-06	3.E-05	Nervous System, Ocular	Nervous System, Ocular	3.E-05	
	Ocular	**3.E-02**							**3.E-02**	**Ocular**
91-57-6	2-Methylnaphthalene	8.E-05	100%		8.E-05		Respiratory			
7440-41-7	Beryllium	2.E-03	98%	2%	2.E-03	5.E-05	Gastrointestinal	Immune System, Respiratory	8.E-05	
92-52-4	Biphenyl	1.E-03	0%	100%	4.E-07	1.E-03	Kidney	Respiratory, Liver, Kidney	1.E-03	
91-20-3	Naphthalene	3.E-04	4%	96%	1.E-05	3.E-04	General Toxicity - Growth	Respiratory	3.E-04	
7440-02-0	Nickel	4.E-01	96%	4%	4.E-01	2.E-02	General Toxicity - Growth	Respiratory	2.E-02	
	Respiratory	**4.E-01**							**2.E-02**	**Respiratory**
11097-69-1	Aroclor-1254 (PCB-1254)	3.E-02	100%		3.E-02		Immune System, Skin, Ocular		3.E-02	
7440-38-2	Arsenic	5.E-02	99%	1%	5.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	5.E-02	
7782-49-2	Selenium	5.E-04	99.995%	0.005%	5.E-04	3.E-08	Nervous System, Hematological, Skin	Nervous system, Hematological, Skin	5.E-04	
7440-22-4	Silver	7.E-04	100%		7.E-04		Skin		7.E-04	
	Skin	**7.E-02**							**7.E-02**	**Skin**
7440-38-2	Arsenic	5.E-02	99%	1%	5.E-02	3.E-04	Skin, Vascular	Developmental, Nervous System	5.E-02	
	Vascular/Cardiovascular	**5.E-02**							**5.E-02**	**Vascular/Cardiovascular**
98-86-2	Acetophenone	3.E-07	100%		3.E-07		None observed		3.E-07	
120-12-7	Anthracene	5.E-08	100%		5.E-08		None observed		5.E-08	
7440-47-3	Chromium	1.E-03	100%		1.E-03		None observed		1.E-03	

Notes
1. Total Hazard Index (HI) undifferentiated by route: the total HI value is calculated assuming that all exposure routes (ingestion/dermal and inhalation) could result in risk to the same target organ.
2. Total Hazard Index (HI) route-specific: the total HI value is calculated assuming that risk to a target organ is apportioned according to the route for which the target endpoint is the target organ being evaluated.
3. Yellow shading indicates HI values undifferentiated by exposure route that do not equal HI values that are exposure route-specific.

RFI TABLES

TABLE 11
RISK EVALUATION - AOC-1: OPEN BURN AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
9E-07	0.2

COC	Frequency of Detection			Range of Detected Concentrations			TEF	Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Dioxins/Furans (pg/g)																		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1	/	1	45	-	45	0.0003	-			[a]		45	MAX	-	-		
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1	/	1	75	-	75	0.0003	-			[a]		75	MAX	-	-		
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1	/	1	24	-	24	0.01	-			[a]		24	MAX	-	-		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	1	/	1	11	-	11	0.01	-			[a]		11	MAX	-	-		
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1	/	1	5	-	5	0.01	-			[a]		5	MAX	-	-		
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1	/	1	4.5	-	4.5	0.1	-			[a]		4.5	MAX	-	-		
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1	/	1	1.4	-	1.4	0.1	-			[a]		1.4	MAX	-	-		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	1	/	1	0.49	-	0.49	0.1	-			[a]		0.49	MAX	-	-		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1	/	1	0.37	-	0.37	0.1	-			[a]		0.37	MAX	-	-		
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1	/	1	1.1	-	1.1	0.1	-			[a]		1.1	MAX	-	-		
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1	/	1	0.99	-	0.99	0.3	-			[a]		0.99	MAX	-	-		
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1	/	1	1	-	1	0.1	-			[a]		1	MAX	-	-		
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1	/	1	0.39	-	0.39	1	-			[a]		0.39	MAX				
TEQ						2							2	TEQ	22	720	9.E-02	3.E-03
Metals (mg/kg)																		
Aluminum	2	/	2	13700	-	17400		11521	YES	AB	[a]		17400	MAX	-	1100000		2.E-02
Arsenic	2	/	2	3.9	-	5.8		19.1	no	BB			NA	NA	3	480		
Barium	2	/	2	119	-	122		82.6	YES	AB	[a]		122	MAX	-	220000		6.E-04
Beryllium	2	/	2	1	-	1.2		0.61	YES	AB	[a]		1.2	MAX	6900	2300	2E-04	5.E-04
Cadmium	2	/	2	3.8	-	4.8		-	YES	NBL	[a]		4.8	MAX	9300	980	5E-04	5.E-03
Calcium	2	/	2	15500	-	40500		2522	YES	AB	[a]		40500	MAX	NSL	NSL	E	E
Chromium	2	/	2	51.8	-	671		18.2	YES	AB	[a]		671	MAX	-	1800000		4.E-04
Cobalt	12	/	12	5.7	-	14		15.7	no	BB			NA	NA	1900	350		
Copper	12	/	12	9	-	1100		26	YES	AB	451	95% Adjusted Gamma	451	95% UCL	-	47000		1.E-02
Iron	2	/	2	25200	-	29300		36177	no	BB			NA	NA	-	820000	E	E
Lead	2	/	2	7.7	-	15.2		29.5	no	BB			NA	NA	-	800		NA
Magnesium	2	/	2	5580	-	9180		3076	YES	AB	[a]		9180	MAX	NSL	NSL	E	E
Manganese	12	/	12	140	-	2810		1504	YES	AB	1426	95% Adjusted Gamma	1426	95% UCL	-	26000		5.E-02
Nickel	12	/	12	14	-	669		30.4	YES	AB	286	95% H	286	95% UCL	64000	22000	4E-03	1.E-02
Potassium	2	/	2	1650	-	1790		679	YES	AB	[a]		1790	MAX	NSL	NSL	E	E
Selenium	2	/	2	0.33	-	0.42		1.79	no	BB			NA	NA	-	5800		
Sodium	2	/	2	35.3	-	114		37.3	YES	AB	[a]		114	MAX	NSL	NSL	E	E
Vanadium	2	/	2	38	-	39		25.5	YES	AB	[a]		39	MAX	-	5800		7.E-03
Zinc	12	/	12	54	-	1900		73.6	YES	AB	1044	95% Adjusted Gamma	1044	95% UCL	-	350000		3.E-03
PCBs (mg/kg)																		
Aroclor-1254 (PCB-1254)	1	/	2	0.77	-	0.77		-			[a]		0.77	MAX	0.97	15	8E-01	5.E-02
Pesticides (mg/kg)																		
4,4'-DDD	1	/	2	0.11	-	0.11		-			[a]		0.11	MAX	9.6	25	1E-02	4.E-03
Semi-Volatile Organic Compounds (mg/kg)																		
bis(2-Ethylhexyl)phthalate	1	/	2	0.24	-	0.24		-			[a]		0.24	MAX	160	16000	2E-03	2.E-05
Fluoranthene	1	/	2	0.19	-	0.19		-			[a]		0.19	MAX	-	30000		6.E-06
Phenanthrene	1	/	2	0.22	-	0.22		-			[a]		0.22	MAX	-	23000		1.E-05
Pyrene	1	/	2	0.13	-	0.13		-			[a]		0.13	MAX	-	23000		6.E-06
Volatile Organic Compounds (mg/kg)																		
cis-1,2-Dichloroethene	1	/	1	0.014	-	0.014		-			[a]		0.014	MAX	-	2300		6.E-06
Tetrachloroethene	2	/	3	0.005	-	0.025		-			[a]		0.025	MAX	100	390	3E-04	6.E-05
Toluene	1	/	3	0.003	-	0.003		-			[a]		0.003	MAX	-	47000		6.E-08
trans-1,2-Dichloroethene	1	/	1	0.00073	-	0.00073		-			[a]		0.00073	MAX	-	23000		3.E-08
Trichloroethene	3	/	3	0.001	-	0.065		-			[a]		0.065	MAX	6	19	1E-02	3.E-03

TABLE 12
RISK EVALUATION - AOC-2: NORTHERN SLUDGE AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
1E-05	4

COC	Frequency of Detection	Range of Detected Concentrations	Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)													
Aluminum	6 / 6	9900 - 24000	11521	YES	AB	21873	95% Student's-t	21873	95% UCL	-	1100000		2E-02
Antimony	5 / 6	8.5 - 385	-	YES	NBL	352	95% KM (Chebyshev)	352	95% UCL	-	470		7E-01
Arsenic	6 / 6	5.3 - 27	19.1	YES	AB	27	95% Student's-t	27	95% UCL	3	480	9E+00	6E-02
Barium	6 / 6	80 - 230	82.6	YES	AB	213	95% Student's-t	213	95% UCL	-	220000		1E-03
Beryllium	6 / 6	0.51 - 1.1	0.61	YES	AB	1.0	95% Student's-t	1.0	95% UCL	6900	2300	1E-04	4E-04
Cadmium	6 / 6	0.36 - 20.9	-	YES	NBL	37	95% Adjusted Gamma	21	MAX	9300	980	2E-03	2E-02
Calcium	6 / 6	43000 - 220000	2522	YES	AB	209109	95% Student's-t	209109	95% UCL	NSL	NSL	E	E
Chromium	6 / 6	4500 - 45000	18.2	YES	AB	41166	95% Student's-t	41166	95% UCL	-	1800000		2E-02
Chromium VI (Hexavalent)	2 / 2	8.3 - 13	-	YES	NBL	[a]		13	MAX	6.3	3500	2E+00	4E-03
Cobalt	23 / 28	3.9 - 44	15.7	YES	AB	12	KM H	12	95% UCL	1900	350	6E-03	3E-02
Copper	28 / 28	20 - 17000	26	YES	AB	6251	95% Adjusted Gamma	6251	95% UCL	-	47000		1E-01
Cyanide	2 / 3	1.4 - 143	-	YES	NBL	[a]		143	MAX	-	150		1E+00
Iron	6 / 6	4400 - 24000	36177	no	BB			NA	NA	-	820000	E	E
Lead	6 / 6	29 - 120	29.5	YES	AB	112	95% Student's-t	112	95% UCL	-	800		NA
Magnesium	6 / 6	2300 - 4600	3076	YES	AB	4267	95% Student's-t	4267	95% UCL	NSL	NSL	E	E
Manganese	28 / 28	60 - 19000	1504	YES	AB	1492	95% H	1492	95% UCL	-	26000		6E-02
Mercury	6 / 6	0.084 - 0.62	0.0513	YES	AB	0.50	95% Student's-t	0.50	95% UCL	-	46		1E-02
Nickel	28 / 28	27 - 32000	30.4	YES	AB	13440	95% Adjusted Gamma	13440	95% UCL	64000	22000	2E-01	6E-01
Potassium	6 / 6	84 - 830	679	YES	AB	578	95% Student's-t	578	95% UCL	NSL	NSL	E	E
Selenium	2 / 6	0.97 - 3.2	1.79	YES	AB	[a]		3.2	MAX	-	5800		6E-04
Silver	3 / 6	0.13 - 7.1	-	YES	NBL	[a]		7.1	MAX	-	5800		1E-03
Sodium	3 / 6	160 - 330	37.3	YES	AB	[a]		330	MAX	NSL	NSL	E	E
Thallium	2 / 5	1.3 - 9.9	0.966	YES	AB	[a]		9.9	MAX	-	12		8E-01
Vanadium	5 / 6	14 - 33	25.5	YES	AB	29	95% Student's-t	29	95% UCL	-	5800		5E-03
Zinc	28 / 28	57 - 6600	73.6	YES	AB	2732	95% Adjusted Gamma	2732	95% UCL	-	350000		8E-03
Semi-Volatile Organic Compounds (mg/kg)													
2-Methylnaphthalene	2 / 2	0.024 - 0.097	-			[a]		0.097	MAX	-	3000		3E-05
Benzo(a)anthracene	2 / 2	0.01 - 0.016	-			[a]		0.016	MAX	21	-	8E-04	
Benzo(a)pyrene	1 / 2	0.016 - 0.016	-			[a]		0.016	MAX	2.1	220	8E-03	7E-05
Benzo(b)fluoranthene	1 / 2	0.011 - 0.011	-			[a]		0.011	MAX	21	-	5E-04	
Benzo(g,h,i)perylene	1 / 2	0.016 - 0.016	-			[a]		0.016	MAX	-	23000		7E-07
bis(2-Ethylhexyl)phthalate	3 / 3	0.25 - 3.5	-			[a]		3.5	MAX	160	16000	2E-02	2E-04
Chrysene	2 / 2	0.014 - 0.025	-			[a]		0.025	MAX	2100	-	1E-05	
Dibenzofuran	2 / 2	0.0062 - 0.019	-			[a]		0.019	MAX	-	1000		2E-05
Di-n-butylphthalate	1 / 2	0.026 - 0.026	-			[a]		0.026	MAX	-	82000		3E-07
Fluoranthene	2 / 3	0.017 - 0.029	-			[a]		0.029	MAX	-	30000		1E-06
Indeno(1,2,3-cd)pyrene	1 / 2	0.011 - 0.011	-			[a]		0.011	MAX	21	-	5E-04	
Naphthalene	2 / 2	0.011 - 0.064	-			[a]		0.064	MAX	17	590	4E-03	1E-04
Phenanthrene	2 / 3	0.025 - 0.032	-			[a]		0.032	MAX	-	23000		1E-06
Pyrene	2 / 3	0.015 - 0.026	-			[a]		0.026	MAX	-	23000		1E-06
Volatile Organic Compounds (mg/kg)													
Carbon disulfide	1 / 2	0.0013 - 0.0013	-			[a]		0.0013	MAX	-	3500		4E-07
Methyl acetate	2 / 2	0.0073 - 0.018	-			[a]		0.018	MAX	-	1200000		2E-08
Methylene chloride	3 / 3	0.0025 - 0.035	-			[a]		0.035	MAX	1000	3200	4E-05	1E-05
Trichloroethene	1 / 3	0.00092 - 0.00092	-			[a]		0.00092	MAX	6	19	2E-04	5E-05

TABLE 13
RISK EVALUATION - AOC-3: SOUTHERN SLUDGE AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
1E-08	0.06

COC	Frequency of Detection	Range of Detected Concentrations	Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)	95% UCL	EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)		**Min - Max**									
Cobalt	14 / 14	9 - 16	15.7	YES AB	13 95% Student's-t	13	95% UCL	1900	350	7E-03	4E-02
Copper	14 / 14	12 - 420	26	YES AB	232 95% Adjusted Gamma	232	95% UCL	-	47000		5E-03
Manganese	14 / 14	220 - 530	1504	no BB		NA	NA	-	26000		
Nickel	14 / 14	20 - 900	30.4	YES AB	389 95% Student's-t	389	95% UCL	64000	22000	6E-03	2E-02
Zinc	14 / 14	78 - 410	73.6	YES AB	229 95% Adjusted Gamma	229	95% UCL	-	350000		7E-04

TABLE 14
RISK EVALUATION - AOC-4: NORTHERN TRENCHES AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
7E-07	0.2

COC	Frequency of Detection			Range of Detected Concentrations			Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		*95% UCL (Too few detections to calculate)*		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)																	
Aluminum	1	/	1	10000	-	10000	11521	no	BB			NA	NA	-	1100000		
Arsenic	1	/	1	7.7	-	7.7	19.1	no	BB			NA	NA	3	480		
Barium	1	/	1	110	-	110	82.6	YES	AB	[a]		110	MAX	-	220000		5E-04
Beryllium	1	/	1	0.71	-	0.71	0.61	YES	AB	[a]		0.71	MAX	6900	2300	1E-04	3E-04
Cadmium	1	/	1	0.62	-	0.62	-	YES	NBL	[a]		0.62	MAX	9300	980	7E-05	6E-04
Calcium	1	/	1	18000	-	18000	2522	YES	AB	[a]		18000	MAX	NSL	NSL	E	E
Chromium	2	/	2	16.5	-	33	18.2	YES	AB	[a]		33	MAX	-	1800000		2E-05
Chromium VI (Hexavalent)	1	/	1	0.71	-	0.71	-	YES	NBL	[a]		0.71	MAX	6.3	3500	1E-01	2E-04
Cobalt	1	/	1	7.1	-	7.1	15.7	no	BB			NA	NA	1900	350		
Copper	2	/	2	66	-	120	26	YES	AB	[a]		120	MAX	-	47000		3E-03
Iron	1	/	1	17000	-	17000	36177	no	BB			NA	NA	-	820000	E	E
Lead	2	/	2	20	-	29	29.5	no	BB			NA	NA	-	800		NA
Magnesium	1	/	1	4500	-	4500	3076	YES	AB	[a]		4500	MAX	NSL	NSL	E	E
Manganese	1	/	1	390	-	390	1504	no	BB			NA	NA	-	26000		
Mercury	1	/	1	0.099	-	0.099	0.0513	YES	AB	[a]		0.099	MAX	-	46		2E-03
Nickel	2	/	2	21.4	-	36	30.4	YES	AB	[a]		36	MAX	64000	22000	6E-04	2E-03
Potassium	1	/	1	880	-	880	679	YES	AB	[a]		880	MAX	NSL	NSL	E	E
Silver	1	/	1	0.14	-	0.14	-	YES	NBL	[a]		0.14	MAX	-	5800		2E-05
Sodium	1	/	1	160	-	160	37.3	YES	AB	[a]		160	MAX	NSL	NSL	E	E
Thallium	1	/	1	1.2	-	1.2	0.966	YES	AB	[a]		1.2	MAX	-	12		1E-01
Vanadium	1	/	1	20	-	20	25.5	no	BB			NA	NA	-	5800		
Zinc	2	/	2	148	-	730	73.6	YES	AB	[a]		730	MAX	-	350000		2E-03
Semi-Volatile Organic Compounds (mg/kg)																	
2-Methylnaphthalene	1	/	2	0.11	-	0.11	-			[a]		0.11	MAX	-	3000		4E-05
Acenaphthene	1	/	2	0.29	-	0.29	-			[a]		0.29	MAX	-	45000		6E-06
Anthracene	1	/	2	0.56	-	0.56	-			[a]		0.56	MAX	-	230000		2E-06
Benzo(a)anthracene	1	/	2	0.69	-	0.69	-			[a]		0.69	MAX	21	-	3E-02	
Benzo(a)pyrene	1	/	2	0.6	-	0.6	-			[a]		0.6	MAX	2.1	220	3E-01	3E-03
Benzo(b)fluoranthene	1	/	2	0.81	-	0.81	-			[a]		0.81	MAX	21	-	4E-02	
Benzo(g,h,i)perylene	1	/	2	0.39	-	0.39	-			[a]		0.39	MAX	-	23000		2E-05
Benzo(k)fluoranthene	1	/	2	0.43	-	0.43	-			[a]		0.43	MAX	210	-	2E-03	
bis(2-Ethylhexyl)phthalate	1	/	2	0.039	-	0.039	-			[a]		0.039	MAX	160	16000	2E-04	2E-06
Carbazole	1	/	1	0.26	-	0.26	-			[a]		0.26	MAX	115	-	2E-03	
Chrysene	1	/	2	0.63	-	0.63	-			[a]		0.63	MAX	2100	-	3E-04	
Dibenzofuran	1	/	2	0.26	-	0.26	-			[a]		0.26	MAX	-	1000		3E-04
Fluoranthene	1	/	2	2	-	2	-			[a]		2	MAX	-	30000		7E-05
Fluorene	1	/	2	0.35	-	0.35	-			[a]		0.35	MAX	-	30000		1E-05
Indeno(1,2,3-cd)pyrene	1	/	2	0.31	-	0.31	-			[a]		0.31	MAX	21	-	1E-02	
Naphthalene	1	/	2	0.072	-	0.072	-			[a]		0.072	MAX	17	590	4E-03	1E-04
Phenanthrene	1	/	2	2.3	-	2.3	-			[a]		2.3	MAX	-	23000		1E-04
Pyrene	1	/	2	1.5	-	1.5	-			[a]		1.5	MAX	-	23000		7E-05
Volatile Organic Compounds (mg/kg)																	
1,2-Dichloroethene (total)	1	/	1	0.1	-	0.1	-			[a]		0.1	MAX	-	2300		4E-05
Acetone	1	/	2	0.006	-	0.006	-			[a]		0.006	MAX	-	670000		9E-09
Carbon disulfide	1	/	2	0.001	-	0.001	-			[a]		0.001	MAX	-	3500		3E-07
Ethylbenzene	1	/	2	0.005	-	0.005	-			[a]		0.005	MAX	25	20000	2E-04	3E-07
Methyl acetate	1	/	1	0.012	-	0.012	-			[a]		0.012	MAX	-	1200000		1E-08
Methylene chloride	2	/	2	0.00	-	0.01	-			[a]		0.012	MAX	1000	3200	1E-05	4E-06
Toluene	1	/	2	0.007	-	0.01	-			[a]		0.007	MAX	-	47000		1E-07
Trichloroethene	1	/	2	1.4	-	1.4	-			[a]		1.4	MAX	6	19	2E-01	7E-02
Xylene (total)	1	/	2	0.026	-	0.026	-			[a]		0.026	MAX	-	2500		1E-05

TABLE 15
RISK EVALUATION - AOC-5: SOUTHERN TRENCHES AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
2.E-05	2

COC	Frequency of Detection			Range of Detected Concentrations			Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)																	
Aluminum	2	/	2	7900	-	9200	11521	no	BB	[a]		NA	NA	-	1100000		
Arsenic	2	/	2	7.5	-	14	19.1	no	BB	[a]		NA	NA	3	480		
Barium	2	/	2	82	-	120	82.6	YES	AB	[a]		120	MAX	-	220000		5E-04
Beryllium	2	/	2	0.57	-	0.86	0.61	YES	AB	[a]		0.86	MAX	6900	2300	1E-04	4E-04
Cadmium	2	/	2	0.5	-	0.54	-	YES	NBL	[a]		0.54	MAX	9300	980	6E-05	6E-04
Calcium	2	/	2	11000	-	22000	2522	YES	AB	[a]		22000	MAX	NSL	NSL	E	E
Chromium	2	/	2	270	-	3400	18.2	YES	AB	[a]		3400	MAX	-	1800000		2E-03
Cobalt	7	/	7	7.5	-	9	15.7	no	BB	8.594	95% Student's-t	NA	NA	1900	350		
Copper	7	/	7	480	-	3900	26	YES	AB	3554	95% H	3554	95% UCL	-	47000		8E-02
Iron	2	/	2	21000	-	23000	36177	no	BB	[a]		NA	NA	-	820000	E	E
Lead	2	/	2	39	-	43	29.5	YES	AB	[a]		43	MAX	-	800		NA
Magnesium	2	/	2	3700	-	5000	3076	YES	AB	[a]		5000	MAX	NSL	NSL	E	E
Manganese	7	/	7	740	-	11000	1504	YES	AB	8637	95% Chebyshev (Mean, Sd)	8637	95% UCL	-	26000		3E-01
Mercury	2	/	2	0.034	-	0.068	0.0513	YES	AB	[a]		0.068	MAX	-	46		1E-03
Nickel	7	/	7	230	-	1800	30.4	YES	AB	1498	95% Adjusted Gamma	1498	95% UCL	64000	22000	2E-02	7E-02
Potassium	2	/	2	860	-	860	679	YES	AB	[a]		860	MAX	NSL	NSL	E	E
Selenium	2	/	2	1.1	-	1.5	1.79	no	BB	[a]		NA	NA	-	5800		
Sodium	2	/	2	110	-	140	37.3	YES	AB	[a]		140	MAX	NSL	NSL	E	E
Thallium	1	/	2	1	-	2	0.966	YES	AB	[a]		2	MAX	-	12		2E-01
Vanadium	2	/	2	20	-	21	25.5	no	BB	[a]		NA	NA	-	5800		
Zinc	7	/	7	1200	-	11000	73.6	YES	AB	8703	95% Adjusted Gamma	8703	95% UCL	-	350000		2E-02
PCBs (mg/kg)																	
Aroclor-1254 (PCB-1254)	21	/	21	0.094	-	36	-			13.69	95% Adjusted Gamma	13.69	95% UCL	0.97	15	1E+01	9E-01
Semi-Volatile Organic Compounds (mg/kg)																	
2-Methylnaphthalene	2	/	2	0.095	-	0.33	-			[a]		0.33	MAX	-	3000		1E-04
Anthracene	1	/	2	0.022	-	0.022	-			[a]		0.022	MAX	-	230000		1E-07
Benzo(a)anthracene	2	/	2	0.065	-	0.073	-			[a]		0.073	MAX	21	-	3E-03	
Benzo(a)pyrene	1	/	2	0.055	-	0.055	-			[a]		0.055	MAX	2.1	220	3E-02	3E-04
Benzo(b)fluoranthene	2	/	2	0.073	-	0.11	-			[a]		0.11	MAX	21	-	5E-03	
Benzo(g,h,i)perylene	1	/	2	0.042	-	0.042	-			[a]		0.042	MAX	-	23000		2E-06
Benzo(k)fluoranthene	1	/	2	0.032	-	0.032	-			[a]		0.032	MAX	210	-	2E-04	
Biphenyl	2	/	2	0.22	-	0.23	-			[a]		0.23	MAX	410	200	6E-04	1E-03
bis(2-Ethylhexyl)phthalate	2	/	2	0.45	-	1.3	-			[a]		1.3	MAX	160	16000	8E-03	8E-05
Chrysene	2	/	2	0.072	-	0.098	-			[a]		0.098	MAX	2100	-	5E-05	
Dibenzofuran	1	/	2	0.036	-	0.036	-			[a]		0.036	MAX	-	1000		4E-05
Fluoranthene	2	/	2	0.13	-	0.13	-			[a]		0.13	MAX	-	30000		4E-06
Fluorene	1	/	2	0.057	-	0.057	-			[a]		0.057	MAX	-	30000		2E-06
Hexachlorobenzene	1	/	2	0.053	-	0.053	-			[a]		0.053	MAX	0.96	930	6E-02	6E-05
Indeno(1,2,3-cd)pyrene	1	/	2	0.032	-	0.032	-			[a]		0.032	MAX	21	-	2E-03	
Naphthalene	2	/	2	0.077	-	0.21	-			[a]		0.21	MAX	17	590	1E-02	4E-04
Phenanthrene	2	/	2	0.14	-	0.22	-			[a]		0.22	MAX	-	23000		1E-05
Pyrene	2	/	2	0.13	-	0.16	-			[a]		0.16	MAX	-	23000		7E-06

TABLE 15
RISK EVALUATION - AOC-5: SOUTHERN TRENCHES AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
2.E-05	2

COC	Frequency of Detection			Range of Detected Concentrations			Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Volatile Organic Compounds (mg/kg)																	
1,1-Dichloroethane	1	/	14	0.0005	-	0.0005	-			[a]		0.00052	MAX	16	230000	3E-05	2E-09
1,1-Dichloroethene	2	/	14	0.014	-	0.073	-			[a]		0.073	MAX	-	1000		7E-05
1,2,4-Trichlorobenzene	1	/	14	0.00064	-	0.18	-			[a]		0.18	MAX	110	260	2E-03	7E-04
1,2-Dichlorobenzene	3	/	14	0.00093	-	0.091	-			[a]		0.091	MAX	-	9300		1E-05
1,3-Dichlorobenzene	2	/	14	0.0011	-	0.002	-			[a]		0.002	MAX	11	25000	2E-04	8E-08
1,4-Dichlorobenzene	1	/	14	0.00073	-	0.00073	-			[a]		0.00073	MAX	11	25000	7E-05	3E-08
2-Butanone (Methyl Ethyl Ketone)	7	/	14	0.013	-	1	-			0.824	99% KM (Chebyshev)	0.82	95% UCL	-	190000		4E-06
2-Hexanone	1	/	14	0.18	-	0.18	-			[a]		0.18	MAX	-	1300		1E-04
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	2	/	14	0.002	-	0.3	-			[a]		0.30	MAX	-	140000		2E-06
Acetone	6	/	14	0.068	-	0.33	-			0.148	95% KM (t)	0.148	95% UCL	-	670000		2E-07
Benzene	8	/	14	0.00036	-	3.4	-			9.029	95% KM Bootstrap t	3.4	MAX	5.1	420	7E-01	8E-03
Carbon disulfide	5	/	14	0.00084	-	0.014	-			0.01	95% KM (t)	0.01	95% UCL	-	3500		2E-06
Chlorobenzene	4	/	14	0.00076	-	0.086	-			0.0	95% KM (t)	0.0	95% UCL	-	1300		2E-05
cis-1,2-Dichloroethene	13	/	14	0.00033	-	0.62	-			0.2010	KM Bootstrap t	0.2010	95% UCL	-	2300		9E-05
Cyclohexane	4	/	14	0.0092	-	0.59	-			0.141	95% KM (t)	0.141	95% UCL	-	27000		5E-06
Ethylbenzene	8	/	14	0.00053	-	0.63	-			0.41	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k	0.41	95% UCL	25	20000	2E-02	2E-05
Isopropylbenzene (Cumene)	6	/	14	0.00037	-	0.12	-			0.13	95% KM Bootstrap t	0.12	MAX	-	9900		1E-05
Methyl acetate	3	/	14	0.14	-	0.9	-			[a]		0.90	MAX	-	1200000		8E-07
Methyl cyclohexane	7	/	14	0.00033	-	0.23	-			0.06	95% KM (t)	0.0606	95% UCL	-	27000		2E-06
Tetrachloroethene	2	/	14	0.00043	-	0.0005	-			[a]		0.001	MAX	100	390	5E-06	1E-06
Toluene	12	/	14	0.00047	-	8.9	-			8.947	99% KM (Chebyshev)	8.9	MAX	-	47000		2E-04
trans-1,2-Dichloroethene	2	/	14	0.026	-	0.04	-			[a]		0.04	MAX	-	23000		2E-06
Trichloroethene	13	/	14	0.0011	-	0.95	-			0.9	99% KM (Chebyshev)	0.9	95% UCL	6	19	1E-01	5E-02
Vinyl chloride	3	/	14	0.006	-	0.063	-			[a]		0.063	MAX	1.7	370	4E-02	2E-04
Xylene (total)	10	/	14	0.00039	-	3.7	-			2	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k	2	95% UCL	-	2500		8E-04

TABLE 16
RISK EVALUATION - AOC-6: NORTHERN DIE STORAGE PAD AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
6E-07	2

COC	Frequency of Detection	Range of Detected Concentrations	Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)													
Aluminum	1 / 1	6900 - 6900	11521	no	BB			NA	NA	-	1100000		
Arsenic	1 / 1	19 - 19	19.1	no	BB			NA	NA	3	480		
Barium	1 / 1	600 - 600	82.6	YES	AB	[a]		600	MAX	-	220000		3E-03
Beryllium	1 / 1	0.57 - 0.57	0.61	no	BB			NA	NA	6900	2300		
Cadmium	1 / 1	6.3 - 6.3	-	YES	NBL	[a]		6.3	MAX	9300	980	7E-04	6E-03
Calcium	1 / 1	15000 - 15000	2522	YES	AB	[a]		15000	MAX	NSL	NSL	E	E
Chromium	1 / 1	1000 - 1000	18.2	YES	AB	[a]		1000	MAX	-	1800000		6E-04
Cobalt	17 / 18	5.5 - 37	15.7	YES	AB	23.27	95% KM (Chebyshev)	23.27	95% UCL	1900	350	1E-02	7E-02
Copper	18 / 18	71 - 52000	26	YES	AB	38904	99% Chebyshev (Mean, Sd)	38904	95% UCL	-	47000		8E-01
Iron	1 / 1	130000 - 130000	36177	YES	AB	[a]		130000	MAX	-	820000	E	E
Lead	4 / 4	41 - 1200	29.5	YES	AB	NA		331.5	AVERAGE	-	800		NA
Magnesium	1 / 1	5700 - 5700	3076	YES	AB	[a]		5700	MAX	NSL	NSL	E	E
Manganese	18 / 18	170 - 5600	1504	YES	AB	1577	95% Adjusted Gamma	1577	95% UCL	-	26000		6E-02
Mercury	1 / 1	0.13 - 0.13	0.0513	YES	AB	[a]		0.13	MAX	-	46		3E-03
Nickel	18 / 18	56 - 25000	30.4	YES	AB	21585	99% Chebyshev (Mean, Sd)	21585	95% UCL	64000	22000	3E-01	1E+00
Potassium	1 / 1	820 - 820	679	YES	AB	[a]		820	MAX	NSL	NSL	E	E
Silver	1 / 1	7.5 - 7.5	-	YES	NBL	[a]		7.5	MAX	-	5800		1E-03
Sodium	1 / 1	1000 - 1000	37.3	YES	AB	[a]		1000	MAX	NSL	NSL	E	E
Vanadium	1 / 1	23 - 23	25.5	no	BB			NA	NA	-	5800		
Zinc	18 / 18	170 - 65000	73.6	YES	AB	59372	99% Chebyshev (Mean, Sd)	59372	95% UCL	-	350000		2E-01
PCBs (mg/kg)													
Aroclor-1254 (PCB-1254)	1 / 1	0.077 - 0.077	-			[a]		0.077	MAX	0.97	15	8E-02	5E-03
Semi-Volatile Organic Compounds (mg/kg)													
2,4-Dichlorophenol	1 / 1	0.15 - 0.15	-			[a]		0.15	MAX	-	2500		6E-05
2,4-Dimethylphenol	1 / 1	0.21 - 0.21	-			[a]		0.21	MAX	-	16000		1E-05
2-Methylnaphthalene	1 / 1	0.14 - 0.14	-			[a]		0.14	MAX	-	3000		5E-05
2-Methylphenol (o-Cresol)	1 / 1	0.17 - 0.17	-			[a]		0.17	MAX	-	41000		4E-06
3&4-Methylphenol	1 / 1	0.42 - 0.42	-			[a]		0.42	MAX	-	23000		2E-05
Acetophenone	1 / 1	0.41 - 0.41	-			[a]		0.41	MAX	-	120000		3E-06
Anthracene	1 / 1	0.048 - 0.048	-			[a]		0.048	MAX	-	230000		2E-07
Benzaldehyde	1 / 1	0.23 - 0.23	-			[a]		0.23	MAX	820	120000	3E-04	2E-06
Biphenyl	1 / 1	0.46 - 0.46	-			[a]		0.46	MAX	410	200	1E-03	2E-03
bis(2-Ethylhexyl)phthalate	1 / 1	3 - 3	-			[a]		3	MAX	160	16000	2E-02	2E-04
Dibenzofuran	1 / 1	0.29 - 0.29	-			[a]		0.29	MAX	-	1000		3E-04
Fluoranthene	1 / 1	0.23 - 0.23	-			[a]		0.23	MAX	-	30000		8E-06
Fluorene	1 / 1	0.082 - 0.082	-			[a]		0.082	MAX	-	30000		3E-06
Hexachlorobenzene	1 / 1	0.045 - 0.045	-			[a]		0.045	MAX	0.96	930	5E-02	5E-05
Naphthalene	1 / 1	1.4 - 1.4	-			[a]		1.4	MAX	17	590	8E-02	2E-03
Phenanthrene	1 / 1	0.48 - 0.48	-			[a]		0.48	MAX	-	23000		2E-05
Phenol	1 / 1	0.13 - 0.13	-			[a]		0.13	MAX	-	250000		5E-07
Pyrene	1 / 1	0.097 - 0.097	-			[a]		0.097	MAX	-	23000		4E-06

TABLE 16
RISK EVALUATION - AOC-6: NORTHERN DIE STORAGE PAD AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
6E-07	2

COC	Frequency of Detection	Range of Detected Concentrations	Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Volatile Organic Compounds (mg/kg)													
1,2-Dichlorobenzene	2 / 5	0.00022 - 0.00034	-			[a]		0.00034	MAX	-	9300		4E-08
1,3-Dichlorobenzene	2 / 5	0.00022 - 0.00033	-			[a]		0.00033	MAX	11	25000	3E-05	1E-08
1,4-Dichlorobenzene	2 / 5	0.00031 - 0.00039	-			[a]		0.00039	MAX	11	25000	4E-05	2E-08
2-Butanone (Methyl Ethyl Ketone)	3 / 5	0.023 - 0.035	-			[a]		0.035	MAX	-	190000		2E-07
2-Hexanone	1 / 5	0.0015 - 0.0015	-			[a]		0.0015	MAX	-	1300		1E-06
Acetone	4 / 5	0.012 - 0.21	-			0.209	95% KM (t)	0.209	95% UCL	-	670000		3E-07
Benzene	3 / 5	0.0013 - 0.002	-			[a]		0.002	MAX	5.1	420	4E-04	5E-06
Carbon disulfide	4 / 5	0.0011 - 0.0038	-			0.00263	95% KM (t)	0.00263	95% UCL	-	3500		8E-07
Chlorobenzene	1 / 5	0.00029 - 0.00029	-			[a]		0.00029	MAX	-	1300		2E-07
cis-1,2-Dichloroethene	1 / 5	0.00097 - 0.00097	-			[a]		0.00097	MAX	-	2300		4E-07
Cyclohexane	1 / 5	0.00065 - 0.00065	-			[a]		0.00065	MAX	-	27000		2E-08
Ethylbenzene	2 / 5	0.00097 - 0.0017	-			[a]		0.0017	MAX	25	20000	7E-05	9E-08
Methyl cyclohexane	1 / 5	0.00059 - 0.00059	-			[a]		0.00059	MAX	-	27000		2E-08
Methylene chloride	3 / 5	0.00035 - 0.00087	-			[a]		0.00087	MAX	1000	3200	9E-07	3E-07
Toluene	3 / 5	0.0018 - 0.0051	-			[a]		0.0051	MAX	-	47000		1E-07
Trichloroethene	4 / 5	0.00037 - 0.0017	-			0.00157	95% Student's-t	0.00157	95% UCL	6	19	3E-04	8E-05
Xylene (total)	4 / 5	0.00056 - 0.011	-			0.00784	95% KM (t)	0.00784	95% UCL	-	2500		3E-06

TABLE 17
RISK EVALUATION - AOC-7: SOUTHERN DIE STORAGE PAD AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
2E-05	2

COC	Frequency of Detection			Range of Detected Concentrations			Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)																	
Aluminum	5	/	5	3300	-	29000	11521	YES	AB	48225	95% Adjusted Gamma	29000	MAX	-	1100000		3.E-02
Arsenic	5	/	5	1.4	-	32	19.1	YES	AB	23.15	95% Student's-t	23.15	95% UCL	3	480	8E+00	5.E-02
Barium	5	/	5	41	-	250	82.6	YES	AB	194.9	95% Student's-t	194.9	95% UCL	-	220000		9.E-04
Beryllium	5	/	5	0.23	-	5.7	0.61	YES	AB	6.086	95% Chebyshev (Mean, Sd)	5.7	MAX	6900	2300	8E-04	2.E-03
Cadmium	4	/	5	0.19	-	4	-	YES	NBL	2.991	95% KM (t)	2.991	95% UCL	9300	980	3E-04	3.E-03
Calcium	5	/	5	1600	-	250,000	2522	YES	AB	543,914	99% Chebyshev (Mean, Sd)	250000	MAX	NSL	NSL	E	E
Chromium	5	/	5	7.3	-	2400	18.2	YES	AB	2325	95% Adjusted Gamma	2325	95% UCL	-	1800000		1.E-03
Cobalt	9	/	9	1	-	14	15.7	no	BB			NA	NA	1900	350		
Copper	9	/	9	1.7	-	38000	26	YES	AB	19052	95% Student's-t	19052	95% UCL	-	47000		4.E-01
Iron	5	/	5	4000	-	77000	36177	YES	AB	56270	95% Student's-t	56270	95% UCL	-	820000	E	E
Lead	5	/	5	1.3	-	430	29.5	YES	AB	289	95% Student's-t	289	95% UCL	-	800		NA
Magnesium	5	/	5	300	-	34000	3076	YES	AB	160457	95% Adjusted Gamma	34000	MAX	NSL	NSL	E	E
Manganese	9	/	9	160	-	2400	1504	YES	AB	1588	95% Adjusted Gamma	1588	95% UCL	-	26000		6.E-02
Mercury	4	/	5	0.037	-	0.2	0.0513	YES	AB	0.148	95% KM (t)	0.148	95% UCL	-	46		3.E-03
Nickel	9	/	9	0.78	-	11000	30.4	YES	AB	8092	95% Adjusted Gamma	8092	95% UCL	64000	22000	1E-01	4.E-01
Potassium	5	/	5	250	-	870	679	YES	AB	844.2	95% Student's-t	844.2	95% UCL	NSL	NSL	E	E
Selenium	5	/	5	1	-	3.6	1.79	YES	AB	3.041	95% Student's-t	3.041	95% UCL	-	5800		5.E-04
Silver	3	/	5	0.68	-	3.9	-	YES	NBL	[a]		3.9	MAX	-	5800		7.E-04
Sodium	5	/	5	89	-	1100	37.3	YES	AB	7108	95% Hall's Bootstrap	1100	MAX	NSL	NSL	E	E
Thallium	2	/	5	0.86	-	2.6	0.966	YES	AB	[a]		2.6	MAX	-	12		2.E-01
Vanadium	5	/	5	5	-	19	25.5	no	BB			NA	NA	-	5800		
Zinc	9	/	9	3.4	-	89000	73.6	YES	AB	142727	95% Adjusted Gamma	89000	MAX	-	350000		3.E-01
PCBs (mg/kg)																	
Aroclor-1254 (PCB-1254)	4	/	6	0.024	-	0.56	-			0.376	95% KM (t)	0.376	95% UCL	0.97	15	4E-01	3.E-02
Aroclor-1260 (PCB-1260)	1	/	6	0.28	-	0.28	-			[a]		0.28	MAX	0.99	-	3E-01	
Semi-Volatile Organic Compounds (mg/kg)																	
2-Methylnaphthalene	5	/	5	0.005	-	0.27	-			0.232	95% Student's-t	0.232	95% UCL	-	3000		8.E-05
Acenaphthene	1	/	5	0.011	-	0.011	-			[a]		0.011	MAX	-	45000		2.E-07
Acetophenone	1	/	5	0.033	-	0.033	-			[a]		0.033	MAX	-	120000		3.E-07
Anthracene	1	/	5	0.012	-	0.012	-			[a]		0.012	MAX	-	230000		5.E-08
Benzo(a)anthracene	2	/	5	0.013	-	0.022	-			[a]		0.022	MAX	21	-	1E-03	
Benzo(a)pyrene	2	/	5	0.01	-	0.016	-			[a]		0.016	MAX	2.1	220	8E-03	7.E-05
Benzo(b)fluoranthene	2	/	5	0.02	-	0.023	-			[a]		0.023	MAX	21	-	1E-03	
Benzo(g,h,i)perylene	2	/	5	0.0095	-	0.012	-			[a]		0.012	MAX	-	2300		5.E-06
Benzo(k)fluoranthene	2	/	5	0.0058	-	0.0078	-			[a]		0.0078	MAX	210	-	4E-05	
Biphenyl	3	/	5	0.027	-	0.26	-			[a]		0.26	MAX	410	200	6E-04	1.E-03
bis(2-Ethylhexyl)phthalate	4	/	5	0.022	-	1.7	-			1.384	95% KM (t)	1.384	95% UCL	160	16000	9E-03	9.E-05
Chrysene	2	/	5	0.019	-	0.029	-			[a]		0.029	MAX	2100	-	1E-05	
Dibenzofuran	3	/	5	0.055	-	0.17	-			[a]		0.17	MAX	-	1000		2.E-04
Dimethyl phthalate	1	/	5	0.5	-	0.5	-			[a]		0.5	MAX	-	660000		8.E-07
Di-n-butylphthalate	1	/	5	0.019	-	0.019	-			[a]		0.019	MAX	-	82000		2.E-07
Fluoranthene	4	/	5	0.0078	-	0.057	-			0.0541	95% KM (t)	0.0541	95% UCL	-	30000		2.E-06
Fluorene	1	/	5	0.013	-	0.013	-			[a]		0.013	MAX	-	30000		4.E-07
Hexachlorobenzene	2	/	5	0.093	-	4.9	-			[a]		4.9	MAX	0.96	930	5E+00	5.E-03
Indeno(1,2,3-cd)pyrene	2	/	5	0.0069	-	0.0073	-			[a]		0.0073	MAX	21	-	3E-04	
Naphthalene	5	/	5	0.0058	-	0.19	-			0.189	95% Student's-t	0.189	95% UCL	17	590	1E-02	3.E-04
Phenanthrene	5	/	5	0.012	-	0.25	-			0.2	95% Student's-t	0.2	95% UCL	-	23000		9.E-06
Pyrene	5	/	5	0.0067	-	0.073	-			0.0655	95% Student's-t	0.0655	95% UCL	-	23000		3.E-06

TABLE 17
RISK EVALUATION - AOC-7: SOUTHERN DIE STORAGE PAD AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
2E-05	2

COC	Frequency of Detection			Range of Detected Concentrations			Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Volatile Organic Compounds (mg/kg)																	
1,1-Dichloroethene	2	/	15	0.0014	-	0.061	-			[a]		0.061	MAX	-	1000		6.E-05
1,2,4-Trichlorobenzene	1	/	15	0.22	-	0.22	-			[a]		0.22	MAX	110	260	2E-03	8.E-04
2-Butanone (Methyl Ethyl Ketone)	2	/	15	0.0027	-	0.011	-			[a]		0.011	MAX	-	190000		6.E-08
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	1	/	15	0.00064	-	0.00064	-			[a]		0.00064	MAX	-	140000		5.E-09
Acetone	3	/	15	0.0073	-	0.076	-			[a]		0.076	MAX	-	670000		1.E-07
Carbon disulfide	2	/	15	0.00048	-	0.0027	-			[a]		0.0027	MAX	-	3500		8.E-07
cis-1,2-Dichloroethene	10	/	15	0.01	-	5.6	-			4.344	99% KM (Chebyshev)	4.344	95% UCL	-	2300		2.E-03
Ethylbenzene	4	/	15	0.0006	-	0.0084	-			0.00265	95% KM (t)	0.00265	95% UCL	25	20000	1E-04	1.E-07
Methyl cyclohexane	2	/	15	0.00029	-	0.00041	-			[a]		0.00041	MAX	-	27000		2.E-08
Methylene chloride	2	/	15	0.0009	-	0.0025	-			[a]		0.0025	MAX	1000	3200	3E-06	8.E-07
Tetrachloroethene	1	/	15	0.013	-	0.013	-			[a]		0.013	MAX	100	390	1E-04	3.E-05
Toluene	9	/	15	0.0025	-	0.31	-			0.0684	95% KM (t)	0.0684	95% UCL	-	47000		1.E-06
trans-1,2-Dichloroethene	2	/	15	0.002	-	0.17	-			[a]		0.17	MAX	-	23000		7.E-06
Trichloroethene	11	/	15	0.00052	-	17	-			15.44	99% KM (Chebyshev)	15.44	95% UCL	6	19	3E+00	8.E-01
Vinyl chloride	6	/	15	0.00073	-	0.09	-			0.0371	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k	0.0371	95% UCL	1.7	370	2E-02	1.E-04
Xylene (total)	7	/	15	0.00065	-	0.14	-			0.0563	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k	0.0563	95% UCL	-	2500		2.E-05

TABLE 18
RISK EVALUATION - AOC-8: FORMER FUEL OIL TANK AREA
RACER ELYRIA
ELYRIA, OHIO

ELCR	HI
1E-08	0.08

COC	Frequency of Detection	Range of Detected Concentrations	Background Concentration (Metals Only)	Retained as a COC after Background Screening? (Metals Only)		95% UCL		EPC	EPC Basis	USEPA November 2019 Industrial Soil RSL (ELCR = 1E-06) Carcinogenic SL	USEPA November 2019 Industrial Soil RSL (HI = 1.0) Non-carcinogenic SL	Cancer risk ratio	Non-cancer risk ratio
Metals (mg/kg)													
Cobalt	13 / 13	5.3 - 11	15.7	no	BB			NA	NA	1900	350		
Copper	13 / 13	25 - 460	26	YES	AB	435	95% Adjusted Gamma	435	95% UCL	-	47000		9E-03
Manganese	13 / 13	190 - 1800	1504	YES	AB	1027	95% Student's-t	1027	95% UCL	-	26000		4E-02
Nickel	13 / 13	18 - 911	30.4	YES	AB	390	95% Adjusted Gamma	390	95% UCL	64000	22000	6E-03	2E-02
Zinc	13 / 13	66 - 910	73.6	YES	AB	642	95% Student's-t	642	95% UCL	-	350000		2E-03
Volatile Organic Compounds (mg/kg)													
1,2-Dichloroethene (total)	1 - 1	0.1 - 0.1				[a]		0.1	MAX	-	2300		4E-05
Acetone	1 - 1	0.008 - 0.008				[a]		0.008	MAX	-	670000		1E-08
Methylene chloride	1 - 1	0.004 - 0.004				[a]		0.004	MAX	1000	3200	4E-06	1E-06
Trichloroethane	1 - 1	0.042 - 0.042				[a]		0.042	MAX	5	6.3	8E-03	7E-03

Abbreviations:

AB = above background.
BB = below background.
COC = constituent of concern.
E = essential nutrient
ELCR = Excess Lifetime Cancer Risk.
EPC = exposure point concentration.
HI = Hazard index.
mg/kg = milligram per kilogram.
NA = not applicable/not available.
NBL = no background level.
NSL = no screening level available.
pg/g: picogram per gram.
RSL = Regional Screening Level.
TEF: Toxicity equivalency factor.
TEQ: Toxicity equivalency quotient.
UCL = Upper confidence limit.
USEPA = United States Environmental Protection Agency.

Notes:

(1) 95%UCLs are calculated using 2016 EPA ProUCL software, version 5.1.002.
Statistic key:
[a] Insufficient number of detections to calculate 95% UCL
[b] Data do not follow a Discernible Distribution at 5% Significance Leve
[c] Data appear gamma distributed but insufficient number of detections to calculate 9%% UCL for gamma distribution

(2) EPCs are the lower value of either the calculated 95% Upper Confidence Limit (95%UCL), or the maximum detected concentrations of the COC.

(3) USEPA Regional Screening Levels are the November 2019 Industrial Soil values, based on a cancer risk of 1E-06 and a hazard index of 1,
https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables

Substitutions:
cis-1,2-dichloroethylene used as a surrogate for 1,2-Dichloroethene (total)
Chromium (III) used as a surrogate for Chromium, Total.
Cyclohexane used as a surrogate for methyl cychlohexane.
1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene
Diethyl phthalate used as a surrogate for dimethylphthalate
2-methylphenol used as a surrogate for 3&4-methylphenol
Pyrene used as a surrogate for benzo(g,h,i)perylene and phenanthrene
1,1,2-trichloroethane used as a surrogate for trichloroethane

(4) Carbazole RSL calculated using USEPA 2014 exposure factors for Commercial/Industrial worker and oral cancer slope facto of 0.02 (HEAST).

(5) HI and ELCR values were summed in accordance with "OAC 3745-300-08 Generic Numerical Standards' Paragraphs F1 and F2 - cumulative adjustment for multiple chemicals.

(6) Background data from Evaluation of Background Metal Soil Concentrations in Lorain County
Developed in Support of the Ohio Voluntary Action Program
Division of Environmental Response and Revitalization, Summary Report, July 2019

TABLE 19
SUMMARY OF ESTIMATED RISK
RACER ELYRIA
ELYRIA, OHIO

SOIL DATA SET		Estimated Risk		Notes
		ELCR	HI	
AOC-1	OPEN BURN AREA	9E-07	0.2	[a]
AOC-2	NORTHERN SLUDGE AREA	1E-05	4	[a],[b]
AOC-3	SOUTHERN SLUDGE AREA	1E-08	0.06	[a]
AOC-4	NORTHERN TRENCHES AREA	7E-07	0.2	[a]
AOC-5	SOUTHERN TRENCHES AREA	**2E-05**	2	[a],[b]
AOC-6	NORTHERN DIE STORAGE PAD AREA	6E-07	2	[a],[b],[c]
AOC-7	SOUTHERN DIE STORAGE PAD AREA	**2E-05**	2	[a],[b]
AOC-8	FORMER FUEL OIL TANK AREA	1E-08	0.08	[a]

Notes:
[a] Risks were calculated using U.S. EPA November 2019 Industrial Soil RSL (HI = 1.0, ELCR = 1E-06).
[b] Evaluation of the effect of individual COCs on target organs indicates that the hazard quotient values do not exceed 1, as discussed in Appendix K.
[c] At AOI-6, a detection of lead exceeded the U.S. EPA RSL limit of 800 mg/kg for industrial soil. See text and Appendix G.

APPENDIX C
Environmental Covenant

Doc ID: 022389420018 Type: OFF
Kind: ENVIRONMENTAL PROTECTION AGEN
Recorded: 07/24/2020 at 03:03:19 PM
Fee Amt: $162.00 Page 1 of 18
Lorain County, Ohio
Judith M Nedwick County Recorder
File 2020-0770851

To be recorded with Deed Records - ORC § 317.08

ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into by RACER Properties LLC ("Owner"), Revitalizing Auto Communities Environmental Response Trust ("RACER Trust") as the Holder, and the Ohio Environmental Protection Agency ("Ohio EPA") pursuant to Ohio Revised Code ("ORC") §§ 5301.80 to 5301.92 for the purpose of subjecting the real property located at 1400 Lowell Street, Elyria, Lorain County, Ohio ("Property" as shown and whose legal description is in Exhibit 1) to the activity and use limitations set forth herein.

WHEREAS, a Resource Conservation and Recovery Act Facility Investigation ("RFI") report summarizing prior and new investigations between 2000 and 2016 and issued in June 2016 evaluated the areas of interest identified in the Property's Site Summary Report (2007) for the presence of releases of hazardous waste or hazardous constituents that could pose an unacceptable risk to human health or the environment.

WHEREAS, the RFI groundwater investigation found that groundwater concentrations exceed U.S. Environmental Protection Agency Maximum Contaminant Levels at one or more locations, potential exposure through future use of groundwater as a potable source may result in an unacceptable risk.

WHEREAS, there are no habitable structures currently on the Property; because of the presence of volatile organic compounds in shallow groundwater at the upgradient boundary of the Property, however, the potential for unacceptable vapor intrusion exposure is assumed unless otherwise demonstrated prior to future construction.

WHEREAS, Human Health Risk Assessment analyses performed so far conclude that for each area of concern ("AOC") identified in the RFI, cancer risks do not exceed the Ohio EPA cancer risk goal of 1E-05 and non-cancer risks do not exceed the risk goal of an Hazard Index of 1 for commercial worker exposure.

WHEREAS, the 2016 RFI's calculated cancer risk for the construction/utility worker exposure to COPCs in soils did not exceed the target cancer risk of 1E-05 within any of

the AOCs; however, the non-cancer target of 1.0 was exceeded in all AOCs except the Open Burn Area.

WHEREAS, the activity and use limitations protect against unacceptable risk to human health and the environment from improper management of waste and other materials.

WHEREAS, the Administrative Record is maintained as the file titled RACER Trust in the Ohio EPA Northeast District Office, 2110 East Aurora Road Twinsburg, Ohio 44087.

Now therefore, the Owner, the Holder, and Ohio EPA agree to the following:

1. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to ORC §§ 5301.80 to 5301.92.

2. Property. This Environmental Covenant concerns an approximately 141-acre tract of real property located at 1400 Lowell Street, in Elyria, Lorain County, Ohio, and more particularly described in Exhibit 1, attached hereto and incorporated by reference herein.

3. Owner. The Property is owned by RACER Properties LLC, with a place of business located at 1505 Woodward Avenue, Suite 200, Detroit, Michigan 48226, and a mailing address of P.O. Box 43859, Detroit, MI 48243.

4. Holder. Pursuant to ORC § 5301.81, the initial holder of this Environmental Covenant is RACER Trust.

5. Activity and Use Limitations. Owner hereby imposes and agrees to comply with the following activity and use limitations:

a. Commercial or Industrial Land Use Only. The Property is hereby restricted to commercial or industrial land use only. Residential land use of the Property is prohibited.

Commercial land use is land use with potential exposure of adult workers during a business day and potential exposures of adults and children who are customers, patrons or visitors to commercial facilities during the

business day. Commercial land use has potential exposure of adults and children to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. Examples of commercial land uses include, but are not limited to: warehouses; building supply facilities; retail gasoline stations; automobile service stations; automobile dealerships; retail warehouses; repair and service establishments for appliances and other goods; professional offices; banks and credit unions; office buildings; retail businesses setting food or merchandise; golf courses; hospitals and clinics; religious institutions; hotels; motels; and parking facilities.

Industrial land use is land use with potential exposure of adult workers during a business day and potential exposures of adults who are visitors to industrial facilities during the business day. Industrial land use has potential exposure of adults to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. Examples of industrial land uses include, but are not limited to: lumberyards; power plants; manufacturing facilities such as metalworking shops, plating shops, blast furnaces, coke plants, oil refineries, brick factories, chemical plants, and plastics plants; assembly plants; non-public airport area; limited access highways; railroad switching yards; and marine port facilities.

b. Prohibition against Groundwater Extraction. Groundwater located at or underlying the Property shall not be extracted or used for any purpose, potable or otherwise, except for investigation, monitoring, or remediation of the groundwater (including through the installation, operation, and maintenance of monitoring wells) or in conjunction with construction or excavation activities or maintenance of subsurface utilities.

c. Prohibition Against Potable Water Well Construction. Construction of potable water wells is prohibited.

d. Limitation on Building Occupancy. Remedy or Demonstration Obligations. Prior to human occupancy of any building constructed on the Property that is defined in Exhibit 1 of the Environmental Covenant as subject to this limitation, Owner shall either: (i) install, operate, and maintain a remedy as an engineering control with respect to such building that eliminates indoor air vapor intrusion exposure to hazardous substances in soil or groundwater in excess of applicable standards, under an operation and maintenance agreement; or (ii) make a demonstration to Ohio EPA that the Property

complies with applicable standards for the vapor intrusion to indoor air exposure pathway without further implementation of remedial activity.

e. Limitation on Excavation Activities. For any and all excavation activities occurring at any depth below the surface within the areas identified in Exhibit 2, notice must be provided to the Owner and Ohio EPA and a health and safety plan must be submitted to Ohio EPA.

f. Limitation on Transfer of Materials. No subsurface soils shall be transferred from the property without notice to the Owner and Ohio EPA.

g. Interference with the Landfill Unit. No activity on the Property that may impact or interfere with the Landfill Unit, identified in Exhibit 3, and no operation, maintenance, inspection, or monitoring of the Landfill Unit shall occur without prior written approval from Ohio EPA. No engagement in or allowances of any uses or activities are permitted on the Property that:

   a. Threaten the integrity of any cover, waste containment, storm water control, gas, leachate, public access control, or environmental monitoring system.
   b. May interfere with the operation and maintenance, monitoring, or other measures necessary to assure the integrity of the Landfill Unit and continued protection of human health and the environment.
   c. May result in release of solid waste constituents or otherwise exacerbate exposures.

6. Running with the Land. This Environmental Covenant shall be binding upon the Owner, during the time that the Owner owns the Property or any portion thereof, and upon all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to ORC § 5301.85, subject to amendment or termination as set forth herein. The term "Transferee" as used in this Environmental Covenant shall mean any future owner of any interest in the Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.

7. Compliance Enforcement. Compliance with this Environmental Covenant may be enforced pursuant to ORC § 5301.91 and other applicable law. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of any party's right to take action to enforce against any

non-compliance. Nothing in this Environmental Covenant shall restrict the Director of Ohio EPA from exercising any authority under applicable law.

8. Rights of Access. Owner hereby grants to Ohio EPA's authorized representatives and to the Holder(s) the right of access to the Property for implementation or enforcement of this Environmental Covenant and shall require such access as a condition of any transfer of the Property or any portion thereof.

9. Compliance Reporting. Owner or Transferee shall annually submit to Ohio EPA and to any Holders, before June 1st of each year, written documentation that complies with the requirements of Ohio Administrative Code rule 3745-50-42(B)-(D), verifying that the activity and use limitations set forth herein remain in place and are being complied with.

10. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion thereof (including leasehold interests) shall contain a notice of the activity and use limitations set forth in this Environmental Covenant and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, RECORDED IN THE DEED OR OFFICIAL RECORDS OF LORAIN COUNTY RECORDER'S OFFICE ON _____, 201__, IN [DOCUMENT ____, or BOOK___, PAGE ____]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS:

A. Commercial or Industrial Land Use Only. The Property is restricted to commercial or industrial land use only. Residential land use of the Property is prohibited.

B. Prohibition against Groundwater Extraction. Groundwater located at or underlying the Property shall not be extracted or used for any purpose, potable or otherwise, except for investigation, monitoring, or remediation of the groundwater (including by monitoring well) or in conjunction with construction or excavation activities or maintenance of subsurface utilities.

C. Prohibition against Potable Water Well Construction. Construction of potable water wells is prohibited.

D. Limitation on Building Occupancy. Remedy or Demonstration Obligations - - the Property must comply with applicable standards for the vapor intrusion to indoor air exposure pathway.

E. Limitation on Excavation Activities. For any and all excavation activities occurring at any depth below the surface within the areas identified in Exhibit 2, notice must be provided to the Owner and Ohio EPA.

F. Limitation on Transfer of Materials. No subsurface soils shall be transferred from the property without notice to the Owner and Ohio EPA.

G. Interference with the Landfill Unit. No activity on the Property that may impact or interfere with the landfill unit, identified in Exhibit 3, and any operation, maintenance, inspection, or monitoring of the landfill unit shall occur without prior written approval from the Ohio EPA.

Owner or Transferee, if applicable, shall notify Ohio EPA and Holder(s) within ten (10) days after each conveyance of an interest in the Property or any portion thereof. The notice shall include the name, address, and telephone number of the Transferee, a copy of the deed or other documentation evidencing the conveyance, and a survey map that shows the boundaries of the real property being transferred.

11. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto that:

a. it is the sole owner of the Property;

b. it holds fee simple title to the Property and that the Owner conducted a current title search that shows that the Property is not subject to any interests or encumbrances that conflict with the activity and use limitations set forth in this Environmental Covenant;

c. it has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided, and to carry out all obligations hereunder;

d. this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document, or

instrument to which Owner is a party or by which Owner may be bound or affected;

e. it has identified all other persons that own an interest in or hold an encumbrance on the Property, and, if applicable, notified such persons of the Owner's intention to enter into this Environmental Covenant.

12. Amendment or Termination. This Environmental Covenant may be amended or terminated by consent of all of the following: the Owner, or a Transferee, if applicable; Holders other than Owner, if any; and the Director of the Ohio EPA, pursuant to ORC §§ 5301.82 and 5301.90 and other applicable law. The term "Amendment" as used in this Environmental Covenant shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein or the elimination of one or more activity and use limitations so long as there is at least one limitation remaining. The term "Termination" as used in this Environmental Covenant shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

This Environmental Covenant may be amended or terminated only by a written instrument duly executed by the Director of Ohio EPA and by the Owner or Transferee, if applicable, of the Property or any portion thereof, *and* Holders or their assignees, if any. Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner or Transferee, if applicable, shall file such instrument for recording with the Lorain County Recorder's Office, and shall provide a file- and date-stamped copy of the recorded instrument to Ohio EPA and Holders or their assignees, if any.

13. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

14. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Ohio.

15. Recordation. Within thirty (30) days after the date of the final required signature, Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, with the Lorain County Recorder's Office.

16. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a deed record for the Property with the Lorain County Recorder's Office.

17. Distribution of Environmental Covenant. Pursuant to ORC § 5301.83, Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to: Ohio EPA; City of Elyria, Ohio; and County of Lorain, Ohio.

18. Notice. Unless otherwise notified in writing by any party hereto or Ohio EPA, any document or communication required by this Environmental Covenant shall be submitted to:

As to Ohio EPA:

Ohio EPA – Central Office
Division of Environmental Response and Revitalization
50 West Town Street
Columbus, OH 43216
Attn.: DERR Records Management Officer

Or, send electronically to: records@epa.ohio.gov

And

Ohio EPA Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
Attn: DERR Site Coordinator for RACER Trust

As to Owner:

Pam Barnett
Cleanup Manager
RACER Properties LLC
P.O. Box 43859
Detroit, MI 48243

As to Holder(s):

Pam Barnett
Cleanup Manager
RACER Trust
P.O. Box 43859
Detroit, MI 48243

[Remainder of page left intentionally blank]

The undersigned represent and certify that they are authorized to execute this Environmental Covenant.

Prepared by Haley & Aldrich

IT IS SO AGREED:

RACER PROPERTIES LLC

By: Revitalizing Auto Communities Environmental Response Trust, Sole Member of RACER Properties LLC

By: EPLET, LLC, acting solely in its capacity as Administrative Trustee of Revitalizing Auto Communities Environmental Response Trust

By: _____
ELLIOTT P. LAWS, not individually, but acting solely in his capacity as Managing Member

STATE OF Michigan)
) SS:
COUNTY OF Wayne)

On the 8 day of April, 2020, before me a Notary Public for the State and County aforesaid, personally appeared ELLIOTT P. LAWS, who acknowledged himself to be the Managing Member of EPLET, LLC, the Administrative Trustee of the REVITALIZING AUTO COMMUNITIES ENVIRONMENTAL RESPONSE TRUST (the "Trust"), Sole Member of RACER PROPERTIES LLC, a Delaware limited liability company, and that he, being authorized to do so, executed the foregoing Environmental Covenant, on behalf of RACER PROPERTIES LLC, not individually, but solely in his capacity as Managing Member of EPLET, LLC, Administrative Trustee of the Trust, its Sole Member, for the purposes therein contained by signing his name.

WITNESS my hand and seal the day and year aforesaid.

Notary's Signature: _____
Notary's Name: Tracie L Nichols
Notary Public, State of Michigan
County of Wayne
My Commission Expires: 3/19/23
Acting in the County of: Wayne

TRACIE L. NICHOLS
Notary Public, State of Michigan
County of Wayne
My Commission Expires 03-19-2023
Acting in the County of Wayne

HOLDER NAME: REVITALIZING AUTO COMMUNITIES ENVIRONMENTAL RESPONSE TRUST

By: EPLET, LLC, acting solely in its capacity as Administrative Trustee of Revitalizing Auto Communities Environmental Response Trust

By: _____

ELLIOTT P. LAWS, not individually, but acting solely in his capacity as Managing Member

STATE OF Michigan)
) SS:
COUNTY OF Wayne)

On the 8th day of April, 2020, before me a Notary Public for the State and County aforesaid, personally appeared ELLIOTT P. LAWS, who acknowledged himself to be the Managing Member of EPLET, LLC, the Administrative Trustee of the REVITALIZING AUTO COMMUNITIES ENVIRONMENTAL RESPONSE TRUST (the "Trust"), and that he, being authorized to do so, executed the foregoing Environmental Covenant, on behalf of the Trust, not individually, but solely in his capacity as Managing Member of EPLET, LLC, for the purposes therein contained by signing his name.

WITNESS my hand and seal the day and year aforesaid.

Notary's Signature: _____
Notary's Name: Tracie L. Nichols
Notary Public, State of Michigan
County of Wayne
My Commission Expires: 3/19/23
Acting in the County of: Wayne

TRACIE L. NICHOLS
Notary Public, State of Michigan
County of Wayne
My Commission Expires 03-19-2023
Acting in the County of Wayne

OHIO ENVIRONMENTAL PROTECTION AGENCY

Laurie A. Stevenson 5/7/20

Laurie A. **Stevenson**, Director

State of Ohio)
) ss:
County of Franklin)

Before me, a notary public, in and for Franklin County, Ohio, personally appeared Laurie A. Stevenson, the Director of Ohio EPA, who acknowledged to me that he did execute the foregoing instrument on behalf of Ohio EPA.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 7 day of May, 2020.

Notary Public

MARCUS J. GLASGOW
NOTARY PUBLIC, STATE OF OHIO
LIFETIME COMMISSION

This instrument was prepared by:

Carl P. Garvey, General Counsel
RACER Properties LLC
P.O. Box 43859
Detroit, MI 48243

Sarah M. Miles, Staff Attorney
Ohio EPA-Legal Office
50 West Town Street
Columbus, OH 43215

EXHIBIT 1

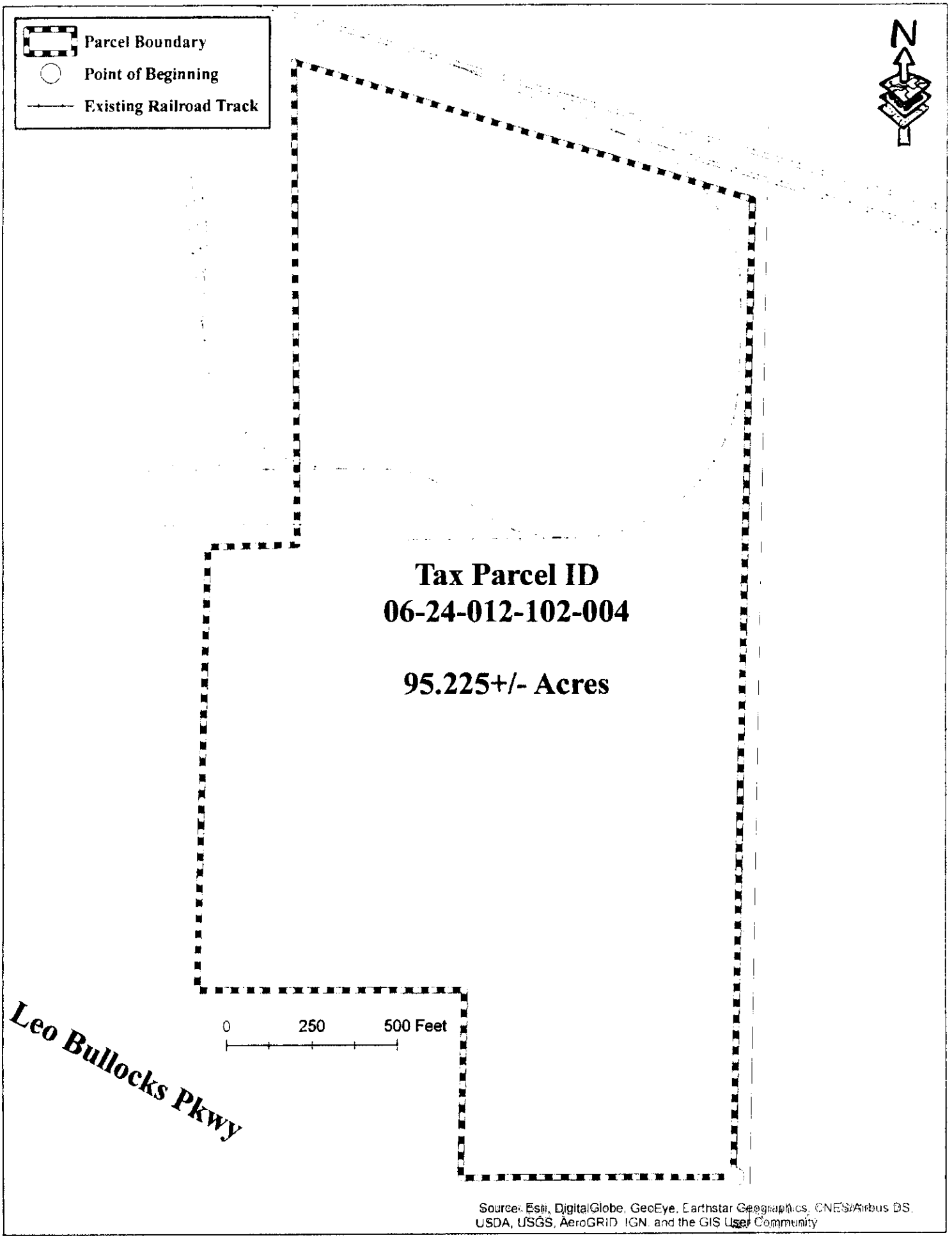

Parcel Boundary
Point of Beginning
Existing Railroad Track
N
Tax Parcel ID
06-24-012-102-004
95.225+/- Acres
0
250
500 Feet
Leo Bullocks Pkwy
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

EXHIBIT 2

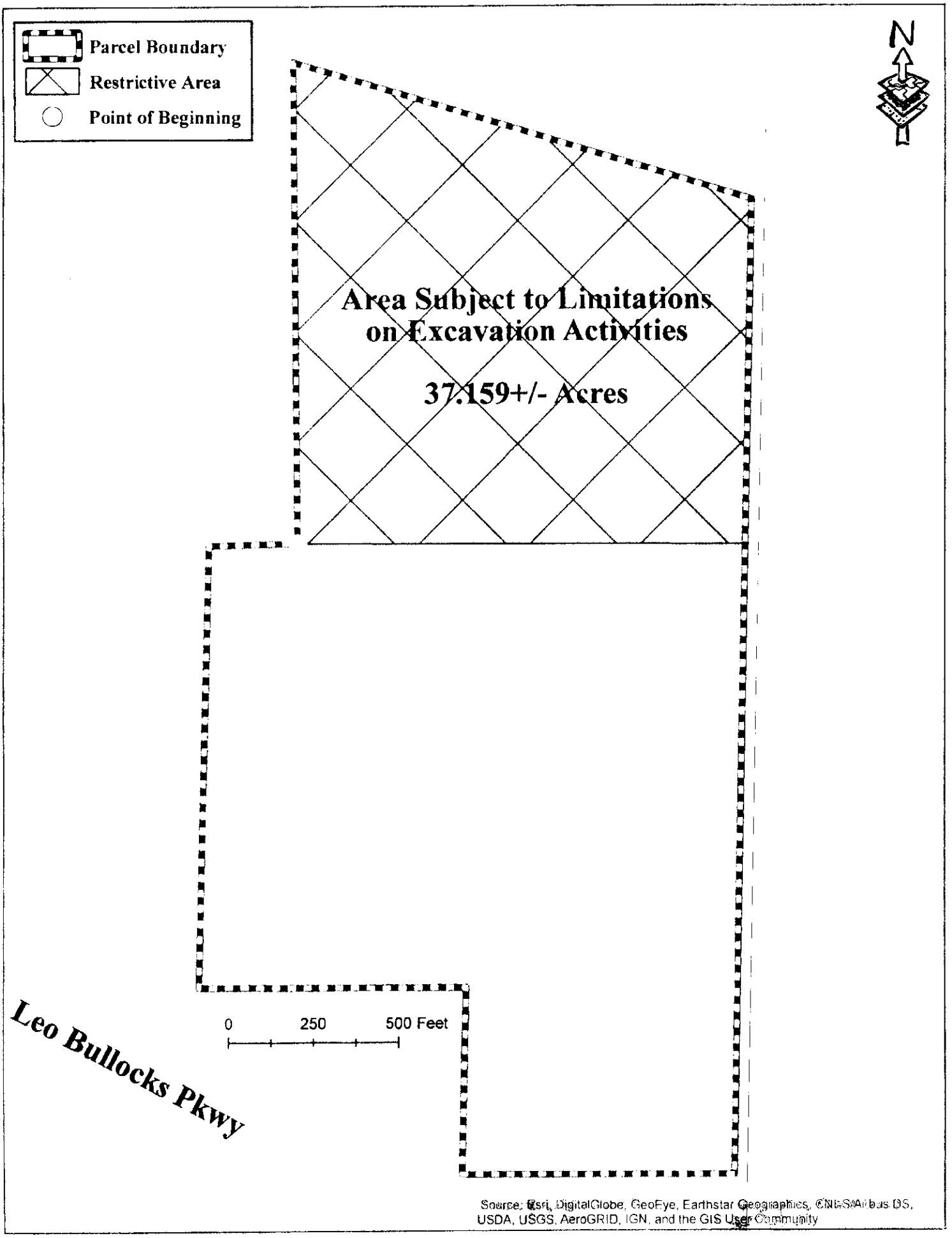
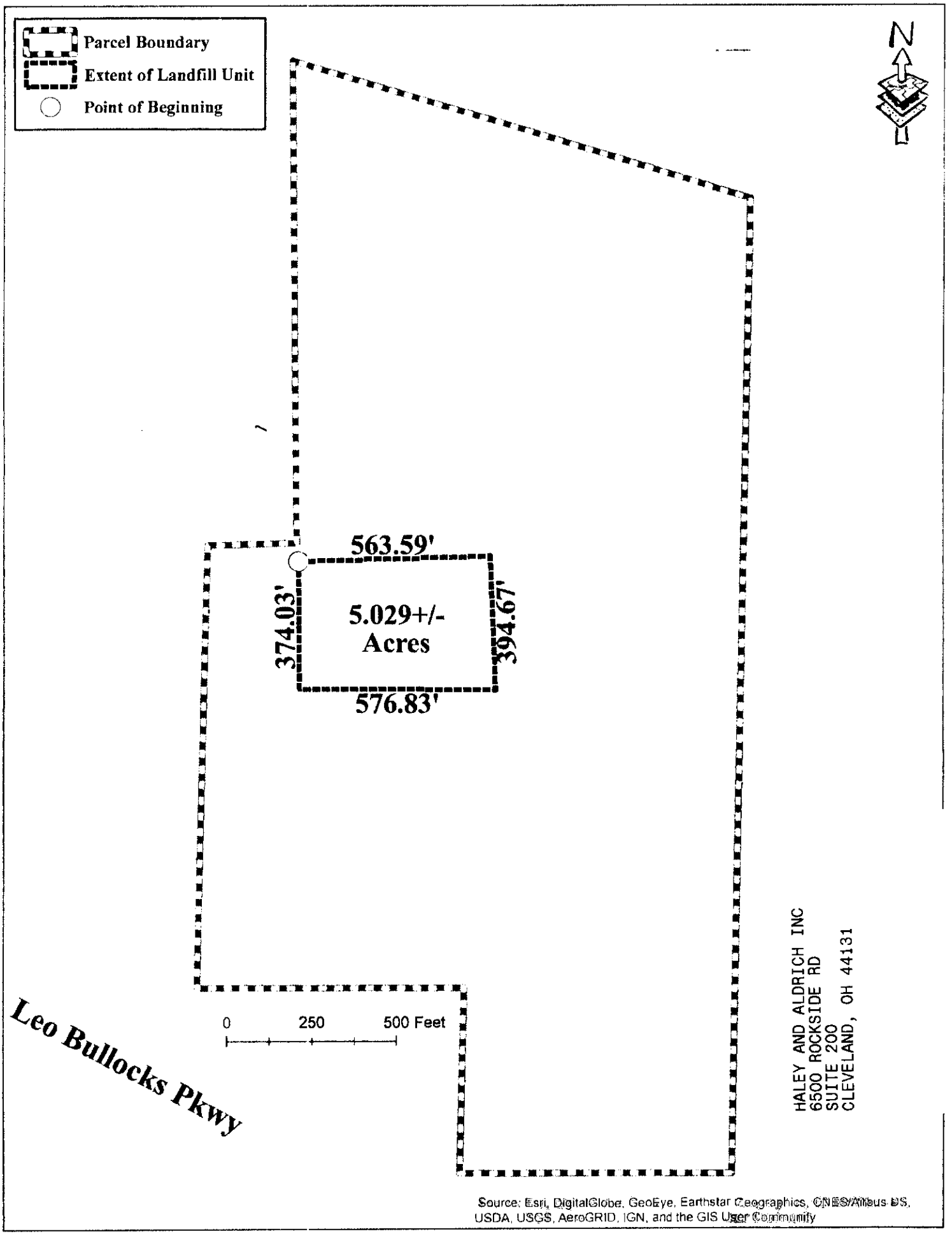

Parcel Boundary
Restrictive Area
Point of Beginning
N
Area Subject to Limitations
on Excavation Activities
37.159+/- Acres
0
250
500 Feet
Leo Bullocks Pkwy
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community

EXHIBIT 3


Parcel Boundary
Extent of Landfill Unit
Point of Beginning
N
563.59'
374.03'
5.029+/-
Acres
394.67'
576.83'
0
250
500 Feet
Leo Bullocks Pkwy
HALEY AND ALDRICH INC
6500 ROCKSIDE RD
SUITE 200
CLEVELAND, OH 44131
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

APPENDIX D
Groundwater Monitoring Plan

HALEY ALDRICH

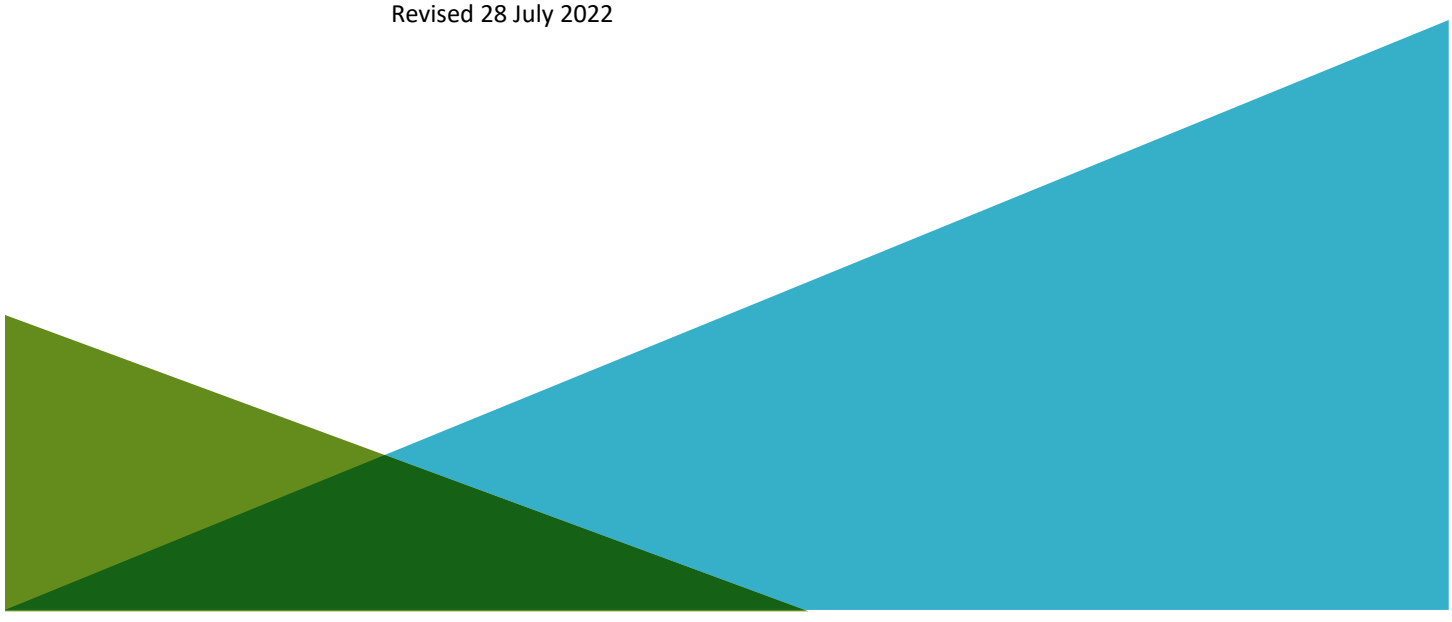
www.haleyaldrich.com

GROUNDWATER MONITORING PLAN
RACER TRUST
RACER ELYRIA, ELYRIA, OHIO

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
RACER Trust
Detroit, Michigan

File No. 0129862
Revised 28 July 2022



HALEY & ALDRICH, INC.
6500 ROCKSIDE ROAD
SUITE 200
CLEVELAND, OH 44131
216.739.0555

SIGNATURE PAGE FOR

GROUNDWATER MONITORING PLAN
RACER TRUST
RACER ELYRIA, ELYRIA, OHIO

PREPARED FOR
RACER TRUST
DETROIT, MICHIGAN

PREPARED BY:

Ban Aragona
Senior Project Manager
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Lloyd Ross
Senior Technical Expert
Haley & Aldrich, Inc.

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HALEY ALDRICH

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A	Groundwater Monitoring Field Form

1. Introduction

This Groundwater Performance Monitoring Plan (Plan) was prepared by Haley & Aldrich, Inc. (Haley & Aldrich) on behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust for the property located at 1400 Lowell Street, in the City of Elyria, Lorain County, Ohio ("Site" Figure 1). This Plan describes the groundwater monitoring support for the proposed final remedy detailed in the Corrective Measures Study (Haley & Aldrich, 2022).

This Groundwater Monitoring Plan has been prepared to describe biennial monitoring used to demonstrate that groundwater flow conditions, which as described in Section 2 .3 are controlled by the storm sewer that traverses the site, are consistent with the conclusions of the *RCRA Facility Investigation Report* (2016 *RFI Report;* CRA, 2016). Groundwater monitoring is planned to be conducted every even year, to coincide with Landfill groundwater monitoring.

The proposed final remedy also includes continued post-closure care of the closed Resource Conservation and Recovery Act (RCRA) landfill. Post-closure activities include groundwater monitoring at and near the landfill, as described in Section 3.1, below. Post-closure activities will continue, as detailed in the Approved Amended Post-Closure Care Plan (PCCP; Haley & Aldrich, 2021). The focus of this Plan is monitoring of the area north of the landfill, as shown in Figure 2.

2. Background

2.1 SITE DESCRIPTION

The Site occupies approximately 95 acres in Lorain County, Ohio. A Site Locus is provided as Figure 1. Abutting properties and land-uses include:

- To the north: a 193-foot-wide railway right-of-way, commercial/industrial properties, and Lowell Street.
- To the east: City of Elyria owned vacant property with dense tree cover.
- To the south: vacant agricultural property and Leo Bullocks Parkway.
- To the west: a 141-acre property owned by Northern Ohio Associates Limited Partnership (NOALP) that is currently used for commercial/industrial purposes.

On 1 June 2009, former General Motors (GM) Corporation and certain subsidiaries filed voluntary petitions for relief under Chapter 11 of the Bankruptcy Code. An order was entered approving the sale of substantially all former GM Corporation's assets to a new and independent company (now known as General Motors Company, LLC) under Section 363 of the Bankruptcy Code on 5 June 2009. The sale closed on 10 July 2009. At that time, former GM Corporation changed its name to Motors Liquidation Company. RACER Trust was established on 31 March 2011 by a federal bankruptcy court to own, manage, remediate, and revitalize the properties from the 2009 former GM Corporation bankruptcy.

2.1.1 Historical Site Use

Historically, the Site and the abutting property to the west (owned by NOALP) were part of the General Motors Inland Fisher Guide Division Plant ("GM Facility"). The portion of the GM Facility that contained the actual production facility was sold to NOALP subsequent to facility closure activities including decontamination and offsite disposal of waste. The remaining portion was transferred to Remediation and Liability Management, Inc. (REALM). The portion of the site owned by REALM then transferred to RACER Trust as part of the GM Bankruptcy.

Electroplating processes, which generated wastewater, were used at the GM Facility. A wastewater treatment plant was used to neutralize wastewater, generating residual sludges that were placed in surface impoundments at the Site.

No sludges were placed into the surface impoundments after August 1986 (Fisher Guide, 1987). Production at the GM Facility ceased in July 1988 (Fisher Guide, 1988). Further information about historical Site use and Site investigation work was provided in the 2016 *RFI Report*.

2.1.2 Current and Future Site Use

Although no daily activities currently occur at the Site, land use is considered commercial/industrial. A closed RCRA landfill (landfill; EPA ID NO. OHD004201091) is located in the southwestern portion of the Site (Figure 2). Under future use, the Site has been restricted to commercial/industrial use, residential land use of the Site is prohibited.

2.2 SITE STRATIGRAPHY

There are three main stratigraphic units at the Site: proceeding from the surface downwards are drift deposits (clay till), Berea Sandstone, and Bedford Shale. All three stratigraphic units are laterally continuous beneath the landfill. The till unit is comprised of soft, silty clay till that varies from light brown to greenish gray and ranges in thickness from 8 to 15 feet. The Berea Sandstone, referred to as the bedrock unit, is comprised of a hard, fine-grained sandstone with occasional thin interbedded shale units. The top of the Berea Sandstone is encountered at an approximate depth of 8 to 15 feet below ground surface (bgs). The Berea Sandstone is thickest (23 feet thick) in the northwestern portion of the Site. The Bedford Shale is comprised of a silty shale with some thin sand horizons and varies in color from gray to reddish gray. No borings penetrated the full thickness of the Bedford Shale beneath the Site, but the Bedford Shale is estimated to be 50 to 90 feet thick in the vicinity of the Site based on background literature. The Bedford Shale has a lower permeability overall than the Berea Sandstone aquifer and is considered a confining unit for the Berea Sandstone aquifer. Onsite borings that partially penetrate the Bedford Shale indicate that no map-able sandy horizons exist within the shale for at least 10 feet below the Berea Sandstone. The two monitoring units are: (1) the Bedrock Unit; and (2) the Till Unit. For the purposes of monitoring, the Bedrock Unit and the Till Unit are considered two distinct units. A complete description of the geologic and hydrogeologic conditions are presented in the 2016 *RFI Report*.

2.3 SITE HYDROGEOLOGY

As described in the 2016 *RFI Report*, the hydrogeologic influences in the vicinity of the Site are the northward-flowing Black River which is located less than 1 mile to the east of the Site, and Lake Erie which is located approximately 8 miles to the north of the Site.

Groundwater is assumed to travel in one stratigraphic horizon which straddles both the Till Contract unit and the Bedrock unit. Because groundwater flow in the Till Contact unit and the Bedrock unit is observed as having similar elevations and groundwater flow patterns when evaluated on a Site-wide basis, and because these two units are in contact with each other, one groundwater flow horizon is representative of Site conditions.

The groundwater flow in the northern portion of the site is influenced by existing storm sewers, as described in Appendix F of the 2016 *RFI Report*. Specifically, the storm sewer system that bisects the northern portion of the property receives groundwater much like a gaining stream and has a “watershed area”. Because of the low permeability soils (Till Contact and Bedrock Unit), the groundwater gradients are greatest (steepest) immediately adjacent to the storm sewer alignment, as shown in Figure 3.

Based on the groundwater flow direction and groundwater sample concentrations, chlorinated solvents are not migrating off of the Site at concentrations greater than the maximum contaminant levels. However, chlorinated compounds in groundwater are discharging to the storm sewers. Concentrations of samples collected from the storm sewer system during dry conditions. The volatile organic compounds detected in the storm sewer at the property boundary are less than the surface water outside mixing zone area criteria and therefore do not pose a risk to surface water. As such, this plan was prepared to demonstrate that the storm sewers continue to control groundwater flow.

3. Groundwater Performance Monitoring Plan

This section presents the groundwater performance monitoring plan for the northern area of the Site.

3.1 LANDFILL POST-CLOSURE PROGRAM

The closed RCRA landfill is currently monitored and inspected in accordance with the PCCP (Haley & Aldrich, 2021). Among other activities, groundwater monitoring is currently conducted on a biennial basis during even years.

Groundwater at and near the landfill will continue to be monitored and reported in accordance with the PCCP.

3.2 GROUNDWATER MONITORING AND EVALUATION

Proposed groundwater monitoring will include collecting water level measurements once annually in the spring when vegetation is sparce. Water levels at the Site will be measured, if possible, within a 24-hour period. Water level measurements will be made from the reference point on the top of the riser (the marked location of the highest point of the riser) to the static water level and to the bottom of the monitoring well. The elevations of the reference points on the risers and wet wells have been determined by a registered surveyor.

Depths to the nearest one hundredth of a foot (0.01) will be determined using a wetted tape, mechanical sounding device, or electrical water level probe following the manufacturer's recommended procedure. Depths to water in selected wells will be recorded on the appropriate field form (Appendix A). The probe cable and tip will be rinsed with a soapy (Alconox) water wash and distilled water, as the equipment is withdrawn from each well. Care will be taken to minimize disturbance to the water column in the wells. Immiscible layers have not been reported at the Site to date. If encountered, the presence of immiscible layers will be identified and noted in the field notes. Measurements will be collected from 22 groundwater monitoring wells and 4 manhole locations as follows and shown on Figure 2:

- FD-01
- FD-02
- FD-03
- FD-04
- FD-05
- FD-07
- FD-09
- FD-11
- FD-12
- FD-14
- MW-15R
- MW-16R
- MW-18
- MW-19
- MW-21D
- MW-21S
- MW-22D
- MW-23S
- MW-25D
- MW-25S
- MW-26D
- MW-26S
- MW-27D
- P-01T
- P-01
- P-05R
- P-05SR
- Manhole 1
- Manhole 2
- Manhole 3
- Former Outfall 001

Following water level measurements, groundwater elevation figures will be prepared with contours and a determination of groundwater flow direction and rate. Baseline contours were created (Figure 2) from a synoptic gauging event in 2022 and will be used as reference for future events to assess changes in

hydrologic conditions at the Site. If groundwater contours generated by future gauging events identify an increase in water level elevation of three feet or greater from the previous annual gauging event at MW-18, MW-19 and FD-09, suggesting a change to the evident inward gradient, the Ohio Environmental Protection Agency (Ohio EPA) will be notified within 48 hours and next steps will be proposed.

3.3 REPORTING

Field forms generated during annual gauging events along with contour maps of groundwater elevations and a summary and conclusions of the groundwater monitoring event will be submitted as a letter report to Ohio EPA within 30 days of the gauging event.

References

1. Fisher Guide Division General Motors Corporation (Fisher Guide), Closure Plan – Hazardous Waste Management Facilities. May 1987.

2. Fisher Guide Division General Motors Corporation (Fisher Guide) RCRA Part B – Post Closure Permit Application. November 1988.

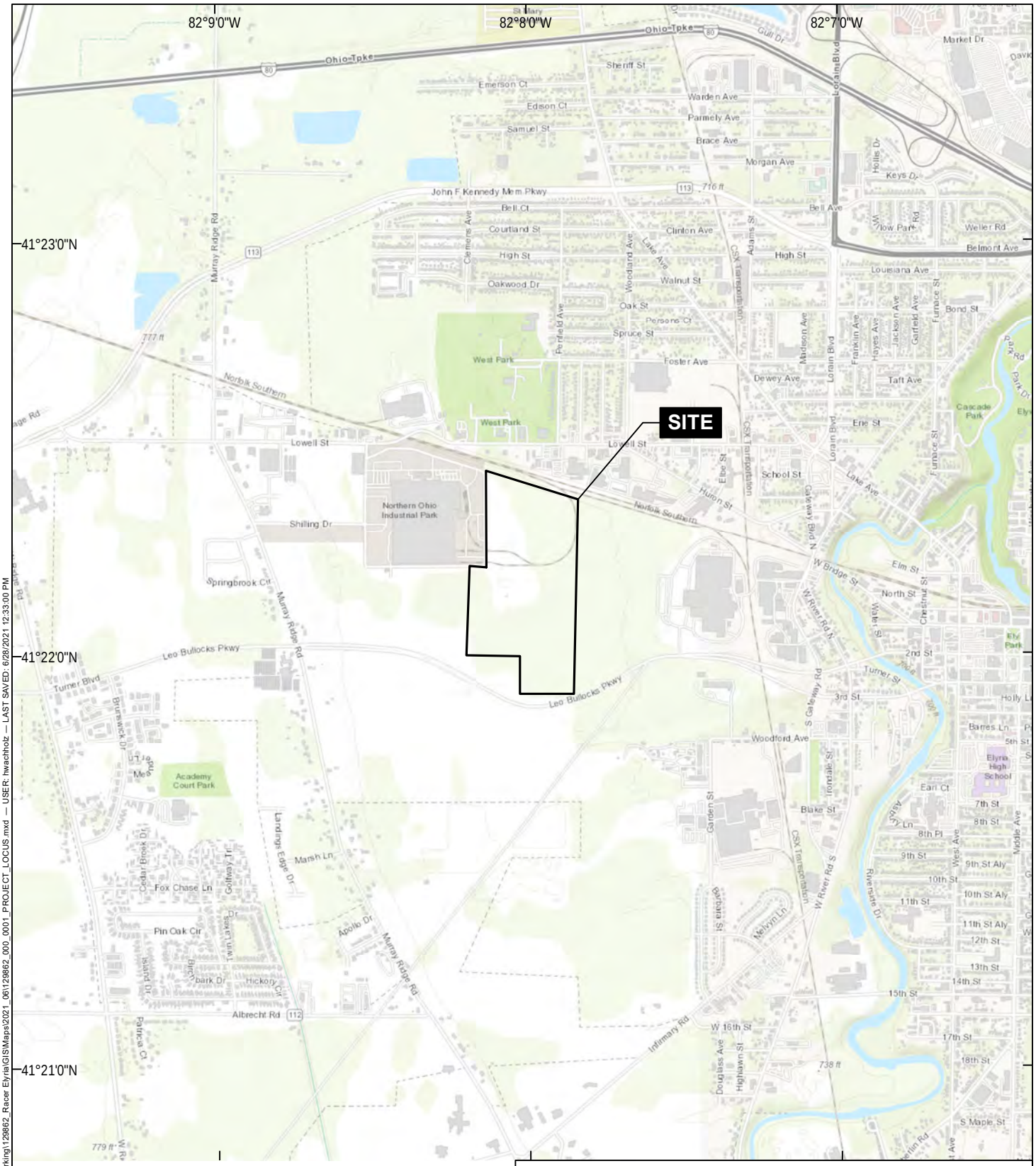
3. CRA, RCRA Facility Investigation Report for the Revitalizing Automotive Communities Environmental Response Trust facility in Elyria, Ohio. December 2016.

4. Approved Amended Post-Closure Care Plan, Haley & Aldrich, 2021.

5. Corrective Measures Study, Haley & Aldrich, June 2022.

\\haleyaldrich.com\share\CF\Projects\129862\Deliverables\CMS_2021\CMS\Appendix D_Groundwater Monitoring Plan\2022_0728_RACER Elyria_GMP_App D_F_R1.docx

FIGURES



HALEY ALDRICH

RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

PROJECT LOCUS

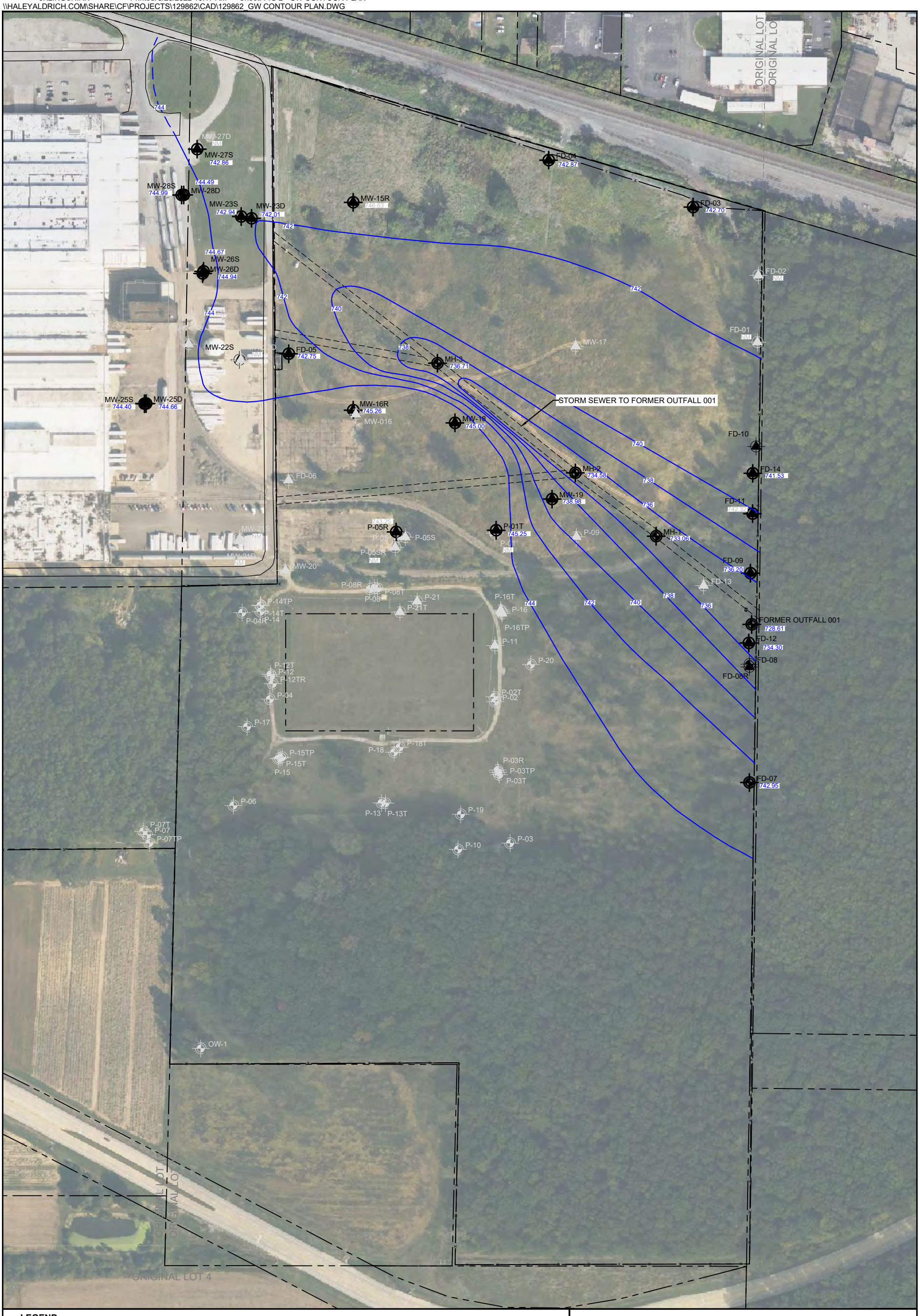
MAP SOURCE: ESRI
SITE COORDINATES: 41°22'18"N, 82°7'57"W

APPROXIMATE SCALE: 1 IN = 2000 FT
JUNE 2021

FIGURE 1

GIS FILE PATH: C:\Users\hwachholz\Documents\working\129862_Racer Elyria\GIS\Maps\2021_06\129862_000_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 6/28/2021 12:33:00 PM

JKLINGSHIRN Printed: 3/23/2022 10:17 AM Sheet: FIG 2 - GW CONTOUR PLAN
\\HALEYALDRICH.COM\SHARE\CF\PROJECTS\129862\CAD\129862_GW CONTOUR PLAN.DWG



LEGEND

- M-23D 742.01 — GROUNDWATER MONITORING LOCATIONS
- M-23D NM — LOCATION NOT MEASURED
- 746.63 — GROUNDWATER ELEVATION
- 746.63 — GROUNDWATER ELEVATION NOT USED IN CONTOUR
- MH-1 — STORM SEWER MANHOLE
- GROUNDWATER ELEVATION
- INFERRED GROUNDWATER ELEVATION
- PROPERTY BOUNDARY
- FENCE

N

0 250 500
SCALE IN FEET

HALEY ALDRICH

RACER TRUST ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

GROUNDWATER CONTOUR PLAN - FEBRUARY 2022

SCALE: AS SHOWN
MARCH 2022

FIGURE 2

APPENDIX A
Groundwater Monitoring Field Form

HALEY ALDRICH

GROUNDWATER MONITORING REPORT

RACER Elyria

Page of

PROJECT		H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT		FIELD REP.	
CONTRACTOR		WEATHER	

Well ID	Time	Date	Depth of Water from Reference Point	Well Condition Issues	Remarks	Read By

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GROUNDWATER MONITORING REPORT

RACER Elyria

Page of

Well ID	Time	Date	Depth of Water from Reference Point	Well Condition Issues	Remarks	Read By

APPENDIX E
Risk Mitigation Plan

HALEY ALDRICH

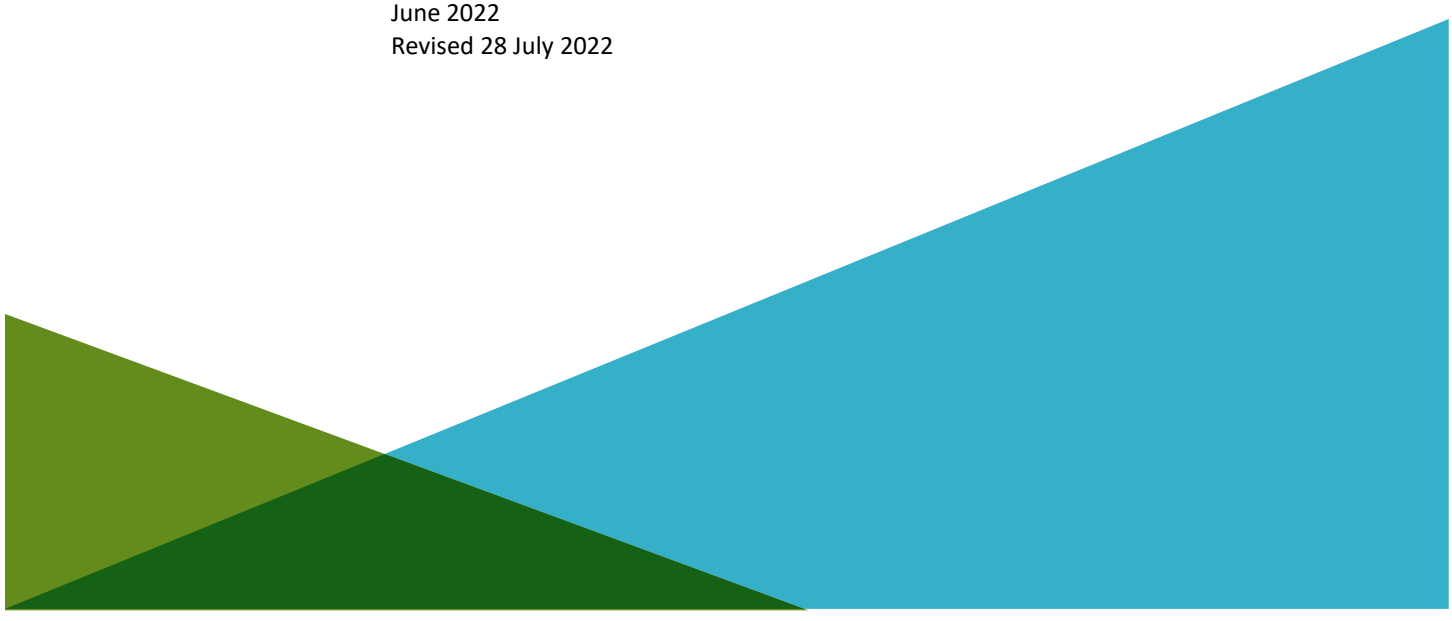
www.haleyaldrich.com

RISK MITIGATION PLAN
RACER TRUST
RACER ELYRIA, ELYRIA, OHIO

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
RACER Trust
Detroit, Michigan

File No. 0129862
June 2022
Revised 28 July 2022



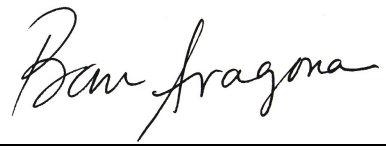
HALEY & ALDRICH, INC.
6500 ROCKSIDE ROAD
SUITE 200
CLEVELAND, OH 44131

SIGNATURE PAGE FOR

RISK MITIGATION PLAN
RACER TRUST
RACER ELYRIA, ELYRIA, OHIO

PREPARED FOR
RACER TRUST
DETROIT, MICHIGAN

PREPARED BY:



Ban Aragona
Senior Project Manager
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Lloyd S. Ross
Senior Technical Expert
Haley & Aldrich, Inc.

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Notice to Contractors and Workers

Prior to any intrusive work in the "Restricted Area" portion of the property located at 1400 Lowell Street, in the City of Elyria, Lorain County, Ohio ("Site") the current Owner of the Site and Ohio Environmental Protection Agency (Ohio EPA) must be notified, and a project specific work plan and a task specific health and safety plan must be prepared in compliance with the requirements set forth in this Risk Mitigation Plan (RMP) and the Environmental Covenant (EC). Additional health and safety considerations are required to be included in the health and safety plan in the designed "Asbestos Containing Material Areas" (ACM Areas) located within the "Restricted Area." No intrusive work may be conducted within the "Restricted Area" at the Site unless the work is documented in compliance with this RMP. No soil shall be transferred from the Site without providing notice to the current Owner of the Site and Ohio EPA.

As prohibited by the Environmental Covenant, groundwater located at or underlying the Site shall not be extracted or used for any purpose, potable or otherwise, except for investigation monitoring or remediation of groundwater (including by monitoring well) or in conjunction with construction or excavation activities or maintenance of subsurface lines. Handling of groundwater shall be in compliance with this RMP and the EC.

No activity at the Site may impact or interfere with the RCRA closed landfill located at the Site.

1. Introduction

This Risk Management Plan (RMP) was prepared on behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust for the property located at 1400 Lowell Street, in the City of Elyria, Lorain County, Ohio ("Site"; Figure 1). This RMP describes the processes for managing soil and groundwater at the Site in conjunction with the 24 July 2020 recorded Environmental Covenant ("EC") as set forth in the *Corrective Measures Study* (Haley & Aldrich, Inc. [Haley & Aldrich], June 2022). This RMP is required to be followed when planning any activities that may disturb Site soil and/or if groundwater is extracted in support of construction or excavation activities or maintenance of subsurface utilities.

This RMP is intended to support the development of project-specific work plans and task-specific health and safety plans (HASPs) before commencement of each new project. The site-specific work plan shall include a list of work activities, locations, depths of excavation, a work schedule, and site maps showing planned activities, staging areas, and work limits. The task-specific HASP must meet applicable Occupational and Health Administration (OSHA) guidelines, including but not limited to Hazardous Waste Operations and Emergency Response (HAZWOPER) per 29 Code of Federal Regulations (CFR) 1910.120 and 29 CFR 1926.65. Additional health and safety considerations are required to be included in the HASP in the designed "Asbestos Containing Material Areas" (ACM Areas) located within the "Restricted Area." The HASP shall include provisions for general safety guidelines, personal protective equipment, decontamination procedures, emergency response, and actions to take if significant exposures occur.

Soil disturbing and/or groundwater extraction activities at the Site are prohibited without compliance with this RMP. This RMP will be provided to ensure that personnel involved in extraction of groundwater, construction, grading, or maintenance that involves moving soil or intruding below ground surface at the Site, as well as those involved in planning and design of construction on the Site, are aware of the on-going requirements to protect worker health and safety, comply with land use and activity restrictions (as set forth in the EC), and maintain the integrity of remedial controls in place at the Site.

2. Background

2.1 SITE DESCRIPTION

The Site, located in Lorain County, Ohio is vacant, unoccupied (no structures), and is approximately 95 acres in area (Figure 1). Abutting properties and land-uses include:

- To the north: a 193-foot-wide railway right-of-way, commercial/industrial properties, and Lowell Street.
- To the east and south: vacant agricultural property, some of which is covered with trees.
- To the west: a 141-acre property owned by Northern Ohio Associates Limited Partnership that is currently used for commercial/industrial purposes.

2.2 HISTORICAL SITE USE

Historically, the Site and the abutting property to the west (owned by Northern Ohio Associates Limited Partnership [NOALP]) were part of the General Motors Inland Fisher Guide Division Plant ("GM Facility"). The portion of the GM Facility that contained the actual production facility was sold to NOALP subsequent to facility closure activities including decontamination and offsite disposal of waste. On 1 June 2009 former GM Corporation and certain subsidiaries filed voluntary petitions for relief under Chapter 11 of the Bankruptcy Code. An order was entered approving the sale of substantially all former GM Corporation's assets to a new and independent company (now known as General Motors Company, LLC) under Section 363 of the Bankruptcy Code on 5 June 2009. The sale closed on 10 July 2009. At that time, former GM Corporation changed its name to Motors Liquidation Company. RACER Trust was established on 31 March 2011 by a federal bankruptcy court to own, manage, remediate, and revitalize the properties from the 2009 former GM Corporation bankruptcy.

Information about historical Site use and Site investigation work was provided in the 2016 Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFI) Report (2016 *RFI Report*; CRA, 2016) and the 2021 *Revised Supplemental RFI Report* (Haley & Aldrich, 2021).

2.3 CURRENT AND FUTURE SITE USE

The Site is mostly covered by vegetation, is unused, and is unoccupied (no structures). The EC restricts current and future land utilization at the Site to commercial/industrial use; residential land use of the Site is prohibited. A closed RCRA landfill (landfill; Environmental Protection Agency identification number [EPA ID NO.] OHD004201091) is located in the southwestern portion of the Site (Figure 2).

3. Previous Investigations

3.1 PREVIOUS INVESTIGATIONS

A complete summary of Site investigations and an evaluation of the presence of hazardous waste or hazardous constituents in soil and groundwater that could pose a potential unacceptable risk to human health or the environment are presented in the 2016 *RFI* Report and the 2021 *Revised Supplemental RFI Report*.

The results of Human Health Risk Assessments conducted for the Site and included in the 2016 *RFI Report* and in the 2021 *Supplemental RFI Report* indicate the following:

- The calculated cancer risk and non-cancer hazard for the industrial/commercial worker future exposure to COPCs in subsurface soils, where they are exposed as surface soil, exceed the risk thresholds in soil greater than 2 feet below ground surface in two areas.
- The calculated cancer risk for the construction/utility worker exposure to COPCs in soils did not exceed cancer risk thresholds within any of the areas; however, the non-cancer hazard threshold was exceeded in all areas except for one area.

As such, work to be conducted greater than 2 feet below ground surface requires precautions to mitigate potential risks. In addition, although not identified as containing concentrations of constituents greater than acceptable risk thresholds, sludge residuals have been identified within 2 feet of ground surface. The residuals, visually identifiable as blue granular material, should not be left on the ground surface.

A summary of soil and groundwater data generated from the site investigation is included in Appendix A.

4. Soil and Groundwater Management

Soil encountered in the "Restricted Area" (Areas 2 and 3 on Figure 2) and groundwater encountered at the Site (Areas 1, 2 and 3 of Figure 2) during soil-disturbing activities (construction or excavation activities or maintenance of subsurface utilities) must be managed in accordance with this RMP and shall be conducted under the oversight of an environmental professional. Personnel conducting excavation, digging, making penetrations below grade, and other soil-disturbing operations, and groundwater extracting activities must be made aware that there is a potential for encountering contamination, and in some locations ACM, and must know the procedures for managing contamination.

A flow chart outlining the basic steps for soil and groundwater mitigation is included as Figure 3.

4.1 PROJECT PLANNING AND PRE-SOIL DISTURBANCE/GROUNDWATER EXTRACTION ACTIVITIES

4.1.1 Notification

Before any soil-disturbing activities are conducted within the "Restricted Area" (Areas 2 and 3, Figure 2) or any groundwater extraction activities are conducted at the Site, the current Owner of the Site and/or Ohio EPA must be notified and a work plan indicating the nature and location of the work to be performed and a task-specific HASP must be prepared. The work plan shall at a minimum include a list of work activities, locations, depths of excavation, a work schedule, and Site maps showing planned activities, staging areas, and work limits. A task-specific HASP must meet applicable OSHA guidelines, including but not limited to HAZWOPER per 29 CFR 1910.120 and 29 CFR 1926.65. The HASP shall include provisions for general safety guidelines, personal protective equipment, decontamination procedures, emergency response, and actions to take if significant exposures occur. Additional safety procedures must be included in the HASP if soil disturbance / groundwater extraction is to take place in ACM identified areas (Area 3, Figure 2).

Before any soil or groundwater is transported from the Site, the contractor must provide notice (including waste profiling, volume, source location, and disposal facility) to the current Owner of the Site and Ohio EPA.

4.2 DURING SOIL DISTURBANCE/GROUNDWATER EXTRACTION ACTIVITIES

The following procedures must be followed during soil disturbance/groundwater extraction activities conducted at the Site.

4.2.1 Control of Project Area

The contractor performing the work shall secure the project area to limit access to only those staff that are authorized and trained to work there.

4.2.2 Landfill Interference

No activity at the Site may impact or interfere with RCRA closed landfill (Figure 2) located at the Site without the involvement of RACER Trust and the Ohio EPA.

4.2.3 Waste Management

Excavated soils from the Restricted Area shall either be placed back into the excavation or disposed off-Site. Groundwater located at or underlying the Site shall not be extracted or used for any purpose, potable or otherwise, except for investigation monitoring or remediation of groundwater (including by monitoring well) or in conjunction with construction or excavation activities or maintenance of subsurface lines. Groundwater extracted from the Site shall be disposed off-Site to an appropriate disposal facility.

4.2.3.1 Soil Removal and Soil Replacement into Excavation

Excavated soil from within the Restricted Area may be temporarily stockpiled within the work area on and covered by 10-mil plastic sheeting until work activities are completed. Excavated soil shall be stored in a secure location within the Site, which must be identified in the project-specific work plans and protected from wind-blown or storm event migration. After work activities are completed, these soils may be placed back into the excavation in a "first out/last in" manner.

4.2.3.2 Soil Removal and Soil Disposal Off-Site

Excavated soil from within the Restricted Area, may be contained at the Site on either 10-mil plastic sheeting, in a roll-off bin, or in Department of Transportation-rated drums until profiled and accepted for off-Site disposal. Excavated soil must be stored in a secure location within the Site, which must be identified in the project-specific work plans and protected from wind-blown or storm event migration.

The excavated soil shall be sampled, characterized, and profiled for removal from the Site to an approved waste disposal facility in accordance with the project-specific work plan. Soil determined to be hazardous shall be transported by a licensed hauler to a permitted hazardous waste disposal facility. Prior to transportation of soil from the Site, the contractor must provide notice (including waste profiling, volume, source location, and disposal facility) to the current Owner of the Site and Ohio EPA.

4.2.3.3 Groundwater

Extracted groundwater from the Site shall be contained at the Site in a temporary above ground tank or in Department of Transportation-rated drums until profiled and accepted for off-Site disposal. Extracted groundwater shall be stored in drums in a secure location within the Site, which must be identified in the project-specific work plans and protected from the elements.

The extracted groundwater shall be sampled, characterized, and profiled for removal from the Site to an approved waste disposal facility in accordance with the project-specific work plan. Extracted groundwater determined to be hazardous shall be transported by a licensed hauler to a permitted hazardous waste disposal facility. Prior to transportation of groundwater from the Site, the contractor must provide notice (including waste profiling, volume, source location, and disposal facility) to the current Owner of the Site and Ohio EPA.

4.3 IMPORTED SOIL

Imported soils that are proposed for use at the Site must be appropriately analyzed to demonstrate that concentrations of constituents of concern are cumulatively below the US EPA Regional Screening Levels (RSLs) for commercial receptors adjusted to an excessive cancer risk of 1E-05 and a hazard index which does not exceed 1. The proposed laboratory analysis must be identified in project-specific work plan.

5. Annual ACM Inspection

Area 3 identified in Figure 2 will be visually inspected annually in the spring season prior to substantial vegetation growth. The northern portion of the Site is periodically mowed, as needed during the growing season (e.g., April - October).

The inspection will consist of physical reconnaissance of the Site for the presence of ACM. As part of this task, a visual inspection of the ground surface will be completed in Area 3 (identified in Figure 2) for the presence of ACM. Each area within Area 3 will be surveyed by walking in a serpentine pattern throughout the grid square to ensure adequate coverage. A leaf rake will be used to gently expose the ground surface, if necessary, to observe the soil surface.

If observed, location and quantity of ACM will be documented, appropriately managed, and prepared for proper disposed. Ohio EPA will be provided with a notification of the ACM, if present, and the documented disposal.

6. Reporting

An annual report will be prepared by the Property owner and submitted to the Ohio EPA. The annual report will either describe the activities that were conducted and describe how the RMP was implemented, or report that the RMP was not implemented during the year. A suggested annual reporting format is included in Appendix B.

In addition, documentation of the ACM inspection will be provided annually. The documentation will include the location and quantity of any ACM observed, if any, and either removal and disposal of the material or schedule to complete removal and disposal.

References

1. CRA, Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report. 19 February 2016.

2. Haley & Aldrich, Revised Supplemental Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report. 26 March 2021.

3. Haley & Aldrich, Corrective Measures Study, June 2022.

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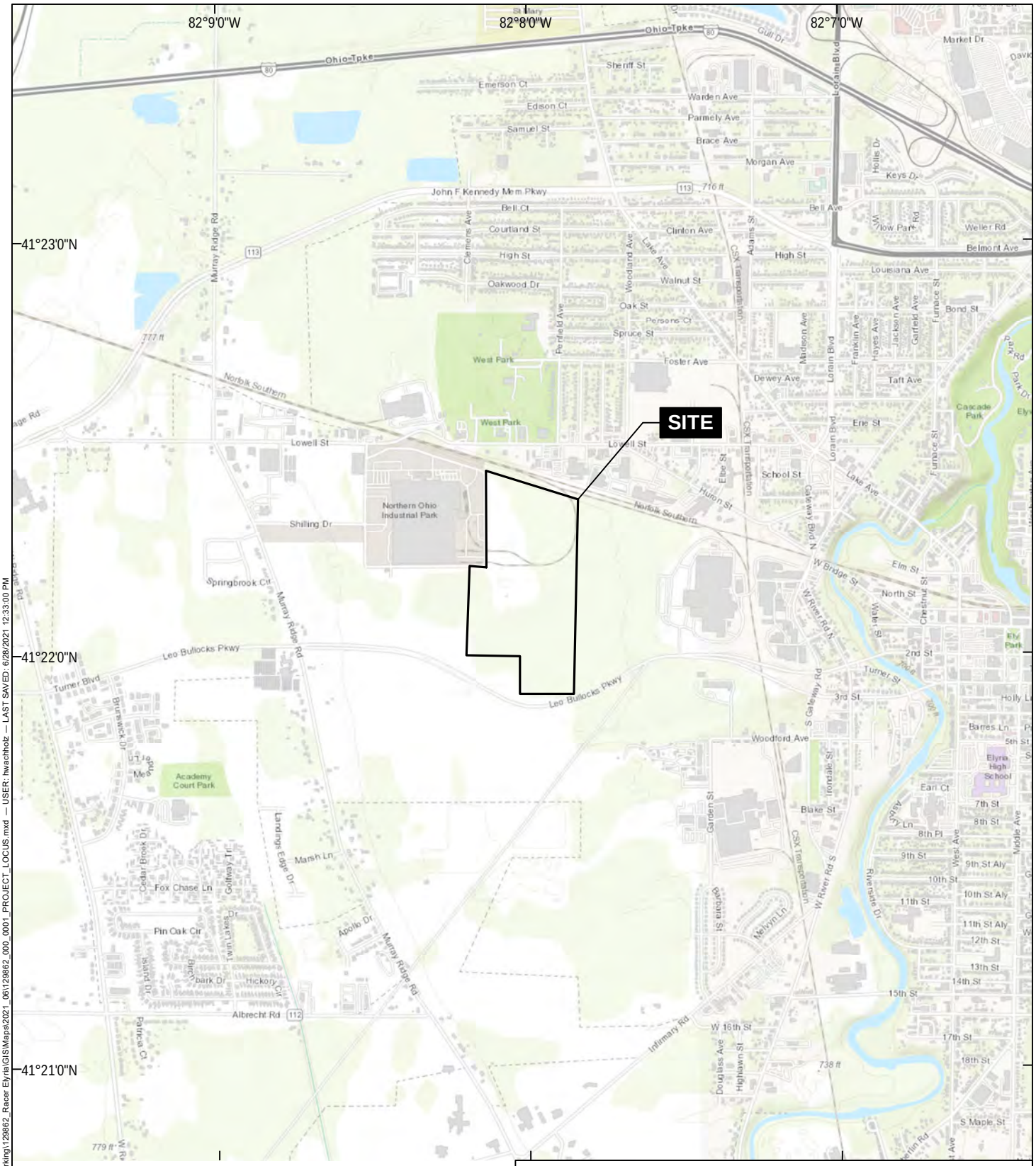
FIGURES



HALEY ALDRICH

RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

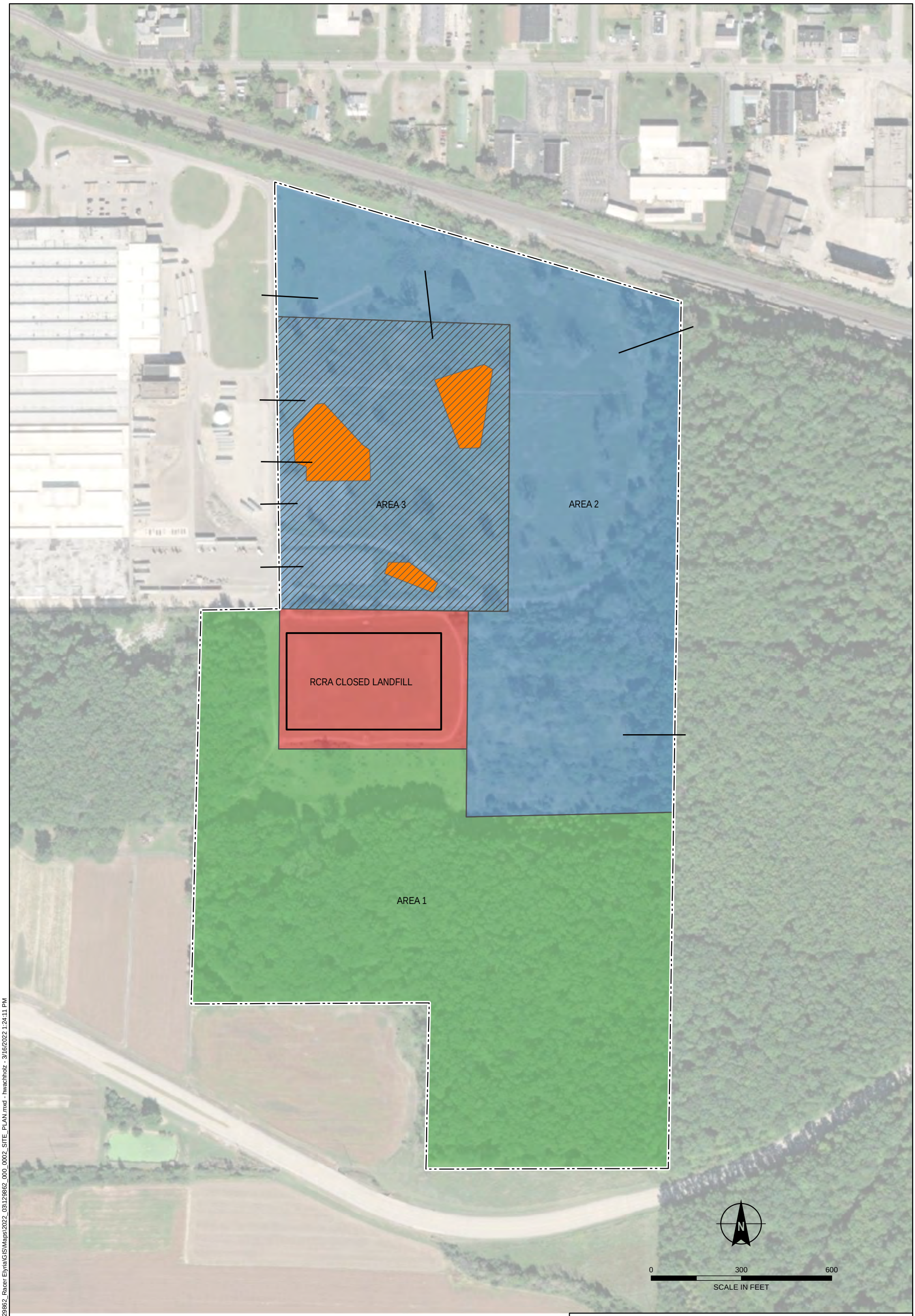
PROJECT LOCUS

MAP SOURCE: ESRI
SITE COORDINATES: 41°22'18"N, 82°7'57"W

APPROXIMATE SCALE: 1 IN = 2000 FT
JUNE 2021

FIGURE 1

GIS FILE PATH: C:\Users\hwachholz\Documents\working\129862_Racer Elyria\GIS\Maps\2021_06\129862_000_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 6/28/2021 12:33:00 PM



LEGEND

- AREA 1
- AREA 2
- AREA 3
- LANDFILL
- RCRA CLOSED LANDFILL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. RCRA = RESOURCE CONSERVATION AND RECOVERY ACT
3. ACM = ASBESTOS CONTAINING MATERIAL
4. AERIAL IMAGERY SOURCE: ESRI

HALEY ALDRICH

RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

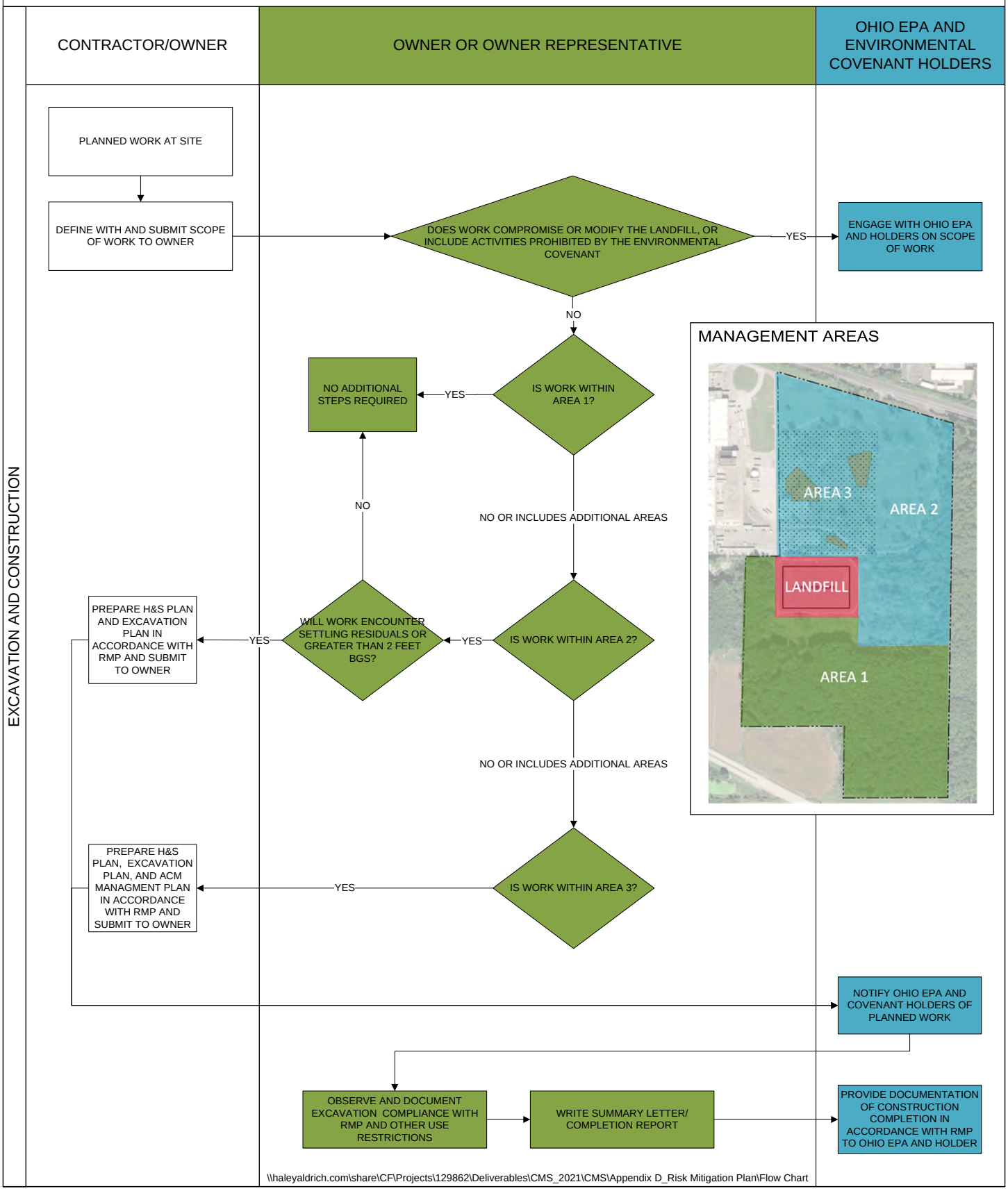
SITE PLAN

MARCH 2022

FIGURE 2

GIS: C:\Users\hwachholz\Documents\working\129862_Racer Elyria\GIS\Maps\2022_03\129862_000_0002_SITE_PLAN.mxd - hwachholz - 3/16/2022 1:24:11 PM

FIGURE 3
RISK MANAGEMENT PLAN FLOW CHART
1400 Lowell Street
Elyria, Ohio



\\haleyaldrich.com\share\CF\Projects\129862\Deliverables\CMS_2021\CMS\Appendix D_Risk Mitigation Plan\Flow Chart

APPENDIX A
Soil and Groundwater Analytical Data

SUMMARY OF DETECTIONS - GROUNDWATER
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
Inorganic Compounds	Aluminum	ug/L	75	101	74%	121000
Inorganic Compounds	Antimony	ug/L	5	8	63%	3.9
Inorganic Compounds	Arsenic	ug/L	30	102	29%	114
Inorganic Compounds	Barium	ug/L	474	511	93%	1900
Inorganic Compounds	Cadmium	ug/L	15	72	21%	6.6
Inorganic Compounds	Calcium	ug/L	593	594	100%	1680000
Inorganic Compounds	Chromium	ug/L	79	190	42%	370
Inorganic Compounds	Chromium III (Trivalent)	ug/L	10	25	40%	90
Inorganic Compounds	Chromium VI (Hexavalent)	ug/L	12	50	24%	95
Inorganic Compounds	Cobalt	ug/L	5	8	63%	6.6
Inorganic Compounds	Copper	ug/L	69	110	63%	1140
Inorganic Compounds	Cyanide	ug/L	23	120	19%	130
Inorganic Compounds	Iron	ug/L	620	673	92%	310000
Inorganic Compounds	Lead	ug/L	55	126	44%	220
Inorganic Compounds	Magnesium	ug/L	702	703	100%	240000
Inorganic Compounds	Manganese	ug/L	667	685	97%	11000
Inorganic Compounds	Mercury	ug/L	2	51	4%	0.3
Inorganic Compounds	Nickel	ug/L	522	580	90%	680
Inorganic Compounds	Potassium	ug/L	474	495	96%	189000
Inorganic Compounds	Selenium	ug/L	7	64	11%	71
Inorganic Compounds	Silver	ug/L	2	53	4%	2
Inorganic Compounds	Sodium	ug/L	806	806	100%	381000
Inorganic Compounds	Zinc	ug/L	58	88	66%	1320
Other	Alkalinity, Bicarbonate	ug/L	21	22	95%	640000
Other	Alkalinity, Carbonate	ug/L	7	22	32%	37000
Other	Chloride	ug/L	754	770	98%	264000
Other	Dissolved Organic Carbon (DOC)	ug/L	10	10	100%	21000
Other	Fluoride	ug/L	88	88	100%	2450
Other	Nitrate (as N)	ug/L	72	90	80%	8000
Other	Nitrite (as N)	ug/L	3	5	60%	10
Other	Sulfate	ug/L	888	888	100%	5500000
Other	Total Coliform Bacteria	/100mL	7	7	100%	3500
Other	Total Dissolved Solids (TDS)	ug/L	47	47	100%	1700000
Other	Total Organic Carbon (TOC)	ug/L	323	334	97%	46000
Other	Total Organic Halides (TOX)	ug/L	140	187	75%	4600
Other	Total Phenols	ug/L	60	127	47%	752
Other	Total Suspended Solids (TSS)	ug/L	34	44	77%	530000

SUMMARY OF DETECTIONS - GROUNDWATER
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
PFAS	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ug/L	2	9	22%	0.055
PFAS	Perfluorobutanesulfonic acid (PFBS)	ug/L	5	9	56%	0.011
PFAS	Perfluorobutanoic acid (PFBA)	ug/L	8	9	89%	0.013
PFAS	Perfluorodecanoic acid (PFDA)	ug/L	1	9	11%	0.00032
PFAS	Perfluoroheptanesulfonic acid (PFHpS)	ug/L	4	9	44%	0.0033
PFAS	Perfluoroheptanoic acid (PFHpA)	ug/L	4	9	44%	0.0039
PFAS	Perfluorohexanesulfonic acid (PFHxS)	ug/L	9	9	100%	0.019
PFAS	Perfluorohexanoic acid (PFHxA)	ug/L	4	9	44%	0.013
PFAS	Perfluorononanoic acid (PFNA)	ug/L	3	9	33%	0.00075
PFAS	Perfluorooctane sulfonamide (PFOSA)	ug/L	2	9	22%	0.00041
PFAS	Perfluorooctanesulfonic acid (PFOS)	ug/L	7	9	78%	0.17
PFAS	Perfluorooctanoic acid (PFOA)	ug/L	7	9	78%	0.0092
PFAS	Perfluoropentanesulfonic acid (PFPeS)	ug/L	4	9	44%	0.014
PFAS	Perfluoropentanoic acid (PFPeA)	ug/L	2	9	22%	0.0026
PFAS	Perfluorotetradecanoic acid (PFTeDA)	ug/L	4	9	44%	0.00049
Radiological	Gross Alpha Analytes	pci/l	27	36	75%	16
Radiological	Gross Beta Analytes	pci/l	32	37	86%	16
Radiological	Radium	pci/l	19	21	90%	8
Radiological	Radium-226	pci/l	15	15	100%	5
Radiological	Radium-228	pci/l	4	4	100%	1.8
Semi-Volatile Organic Compounds	bis(2-Ethylhexyl)phthalate	ug/L	1	3	33%	2
Volatile Organic Compounds	1,1,1-Trichloroethane	ug/L	2	107	2%	10
Volatile Organic Compounds	1,1-Dichloroethane	ug/L	7	107	7%	2.8
Volatile Organic Compounds	1,1-Dichloroethene	ug/L	8	110	7%	11
Volatile Organic Compounds	1,2-Dichloroethene (total)	ug/L	2	4	50%	1800
Volatile Organic Compounds	2-Butanone (Methyl Ethyl Ketone)	ug/L	5	96	5%	5.7
Volatile Organic Compounds	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/L	1	87	1%	1.2
Volatile Organic Compounds	Acetone	ug/L	33	117	28%	53
Volatile Organic Compounds	Benzene	ug/L	9	107	8%	0.72
Volatile Organic Compounds	Carbon disulfide	ug/L	13	103	13%	1.6
Volatile Organic Compounds	Chloroethane	ug/L	1	117	1%	0.33
Volatile Organic Compounds	Chloroform (Trichloromethane)	ug/L	2	107	2%	0.6
Volatile Organic Compounds	cis-1,2-Dichloroethene	ug/L	69	123	56%	830
Volatile Organic Compounds	Cyclohexane	ug/L	3	77	4%	1.5
Volatile Organic Compounds	Di-n-octyl phthalate	ug/L	5	9	56%	2
Volatile Organic Compounds	Ethylbenzene	ug/L	3	103	3%	90
Volatile Organic Compounds	Methylcyclohexane	ug/L	3	77	4%	1.1

SUMMARY OF DETECTIONS - GROUNDWATER
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
Volatile Organic Compounds	Methylene chloride (Dichloromethane)	ug/L	8	123	7%	42
Volatile Organic Compounds	Styrene	ug/L	3	95	3%	1.1
Volatile Organic Compounds	Tetrachloroethene	ug/L	2	107	2%	0.59
Volatile Organic Compounds	Toluene	ug/L	12	112	11%	44
Volatile Organic Compounds	trans-1,2-Dichloroethene	ug/L	52	137	38%	370
Volatile Organic Compounds	Trichloroethane	ug/L	1	2	50%	1800
Volatile Organic Compounds	Trichloroethene	ug/L	59	155	38%	7000
Volatile Organic Compounds	Vinyl chloride	ug/L	74	163	45%	1500
Volatile Organic Compounds	Xylene (total)	ug/L	3	92	3%	780
Volatile Organic Compounds SIM	1,4-Dioxane	ug/L	3	9	33%	4.2

ug/l - micrograms per liter
pci/l - picocuries per liter

SUMMARY OF DETECTIONS - SOIL
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
Dioxins/Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	mg/kg	1	1	100%	0.000045
Dioxins/Furans	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	mg/kg	1	1	100%	0.000075
Dioxins/Furans	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	mg/kg	1	1	100%	0.000024
Dioxins/Furans	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	mg/kg	1	1	100%	0.000011
Dioxins/Furans	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	mg/kg	1	1	100%	0.000005
Dioxins/Furans	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	mg/kg	1	1	100%	0.0000045
Dioxins/Furans	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	mg/kg	1	1	100%	0.0000014
Dioxins/Furans	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	mg/kg	1	1	100%	0.00000049
Dioxins/Furans	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	mg/kg	1	1	100%	0.00000037
Dioxins/Furans	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	mg/kg	1	1	100%	0.0000011
Dioxins/Furans	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	mg/kg	1	1	100%	0.00000099
Dioxins/Furans	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	mg/kg	1	1	100%	0.000001
Dioxins/Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	mg/kg	1	1	100%	0.00000039
Dioxins/Furans	Total Heptachlorodibenzofuran (HpCDF)	mg/kg	1	1	100%	0.000045
Dioxins/Furans	Total Heptachlorodibenzo-p-dioxin (HpCDD)	mg/kg	1	1	100%	0.000021
Dioxins/Furans	Total Hexachlorodibenzofuran (HxCDF)	mg/kg	1	1	100%	0.00002
Dioxins/Furans	Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	mg/kg	1	1	100%	0.0000049
Dioxins/Furans	Total Pentachlorodibenzofuran (PeCDF)	mg/kg	1	1	100%	0.0000095
Dioxins/Furans	Total Pentachlorodibenzo-p-dioxin (PeCDD)	mg/kg	1	1	100%	0.0000013
Dioxins/Furans	Total Tetrachlorodibenzofuran (TCDF)	mg/kg	1	1	100%	0.0000038
Dioxins/Furans	Total Tetrachlorodibenzo-p-dioxin (TCDD)	mg/kg	1	1	100%	0.0000019
Inorganic Compounds	Aluminum	mg/kg	45	45	100%	29000
Inorganic Compounds	Antimony	mg/kg	15	45	33%	385
Inorganic Compounds	Arsenic	mg/kg	45	45	100%	32
Inorganic Compounds	Barium	mg/kg	45	45	100%	600
Inorganic Compounds	Beryllium	mg/kg	45	45	100%	8.4
Inorganic Compounds	Cadmium	mg/kg	30	45	67%	20.9
Inorganic Compounds	Calcium	mg/kg	45	45	100%	260000
Inorganic Compounds	Chromium	mg/kg	79	80	99%	45000
Inorganic Compounds	Chromium VI (Hexavalent)	mg/kg	16	27	59%	18
Inorganic Compounds	Cobalt	mg/kg	176	188	94%	49
Inorganic Compounds	Copper	mg/kg	220	220	100%	69000
Inorganic Compounds	Iron	mg/kg	45	45	100%	130000
Inorganic Compounds	Lead	mg/kg	55	56	98%	1200
Inorganic Compounds	Magnesium	mg/kg	45	45	100%	36000
Inorganic Compounds	Manganese	mg/kg	188	188	100%	19000
Inorganic Compounds	Mercury	mg/kg	33	45	73%	0.79

SUMMARY OF DETECTIONS - SOIL
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
Inorganic Compounds	Nickel	mg/kg	223	223	100%	34000
Inorganic Compounds	Potassium	mg/kg	45	45	100%	3540
Inorganic Compounds	Selenium	mg/kg	18	45	40%	4.2
Inorganic Compounds	Silver	mg/kg	13	45	29%	7.5
Inorganic Compounds	Sodium	mg/kg	29	45	64%	2400
Inorganic Compounds	Thallium	mg/kg	20	38	53%	14
Inorganic Compounds	Vanadium	mg/kg	42	45	93%	38.8
Inorganic Compounds	Zinc	mg/kg	195	196	99%	89000
Other	Cyanide	mg/kg	14	35	40%	143
PCBs	Aroclor-1254 (PCB-1254)	mg/kg	27	38	71%	36
PCBs	Aroclor-1260 (PCB-1260)	mg/kg	1	31	3%	0.28
Pesticides	4,4'-DDD	mg/kg	1	7	14%	0.11
Semi-Volatile Organic Compounds	2,4-Dichlorophenol	mg/kg	1	22	5%	0.15
Semi-Volatile Organic Compounds	2,4-Dimethylphenol	mg/kg	1	22	5%	0.21
Semi-Volatile Organic Compounds	2-Methylnaphthalene	mg/kg	13	22	59%	0.33
Semi-Volatile Organic Compounds	2-Methylphenol (o-Cresol)	mg/kg	1	22	5%	0.17
Semi-Volatile Organic Compounds	3&4-Methylphenol	mg/kg	1	16	6%	0.42
Semi-Volatile Organic Compounds	Acenaphthene	mg/kg	3	22	14%	0.29
Semi-Volatile Organic Compounds	Acetophenone	mg/kg	3	16	19%	0.41
Semi-Volatile Organic Compounds	Anthracene	mg/kg	6	22	27%	0.56
Semi-Volatile Organic Compounds	Benzaldehyde	mg/kg	2	16	13%	0.23
Semi-Volatile Organic Compounds	Benzo(a)anthracene	mg/kg	9	22	41%	0.69
Semi-Volatile Organic Compounds	Benzo(a)pyrene	mg/kg	7	22	32%	0.6
Semi-Volatile Organic Compounds	Benzo(b)fluoranthene	mg/kg	8	22	36%	0.81
Semi-Volatile Organic Compounds	Benzo(g,h,i)perylene	mg/kg	7	22	32%	0.39
Semi-Volatile Organic Compounds	Benzo(k)fluoranthene	mg/kg	6	22	27%	0.43
Semi-Volatile Organic Compounds	Biphenyl	mg/kg	6	16	38%	0.46
Semi-Volatile Organic Compounds	bis(2-Ethylhexyl)phthalate	mg/kg	22	29	76%	6.3
Semi-Volatile Organic Compounds	Carbazole	mg/kg	1	16	6%	0.26
Semi-Volatile Organic Compounds	Chrysene	mg/kg	9	22	41%	0.63
Semi-Volatile Organic Compounds	Dibenzofuran	mg/kg	9	22	41%	0.29
Semi-Volatile Organic Compounds	Diethyl phthalate	mg/kg	1	22	5%	0.11
Semi-Volatile Organic Compounds	Dimethyl phthalate	mg/kg	1	22	5%	0.5
Semi-Volatile Organic Compounds	Di-n-butylphthalate	mg/kg	3	22	14%	0.031
Semi-Volatile Organic Compounds	Fluoranthene	mg/kg	14	29	48%	2
Semi-Volatile Organic Compounds	Fluorene	mg/kg	5	22	23%	0.35
Semi-Volatile Organic Compounds	Hexachlorobenzene	mg/kg	4	22	18%	4.9

SUMMARY OF DETECTIONS - SOIL
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
Semi-Volatile Organic Compounds	Indeno(1,2,3-cd)pyrene	mg/kg	7	22	32%	0.31
Semi-Volatile Organic Compounds	Naphthalene	mg/kg	14	22	64%	1.4
Semi-Volatile Organic Compounds	Phenanthrene	mg/kg	14	29	48%	2.3
Semi-Volatile Organic Compounds	Phenol	mg/kg	2	22	9%	0.13
Semi-Volatile Organic Compounds	Pyrene	mg/kg	15	29	52%	1.5
Total Petroleum Hydrocarbons	Oil and Grease	mg/kg	3	3	100%	150000
Volatile Organic Compounds	1,1,1-Trichloroethane	mg/kg	5	134	4%	0.56
Volatile Organic Compounds	1,1-Dichloroethane	mg/kg	2	134	1%	0.0059
Volatile Organic Compounds	1,1-Dichloroethene	mg/kg	6	134	4%	0.073
Volatile Organic Compounds	1,2,4-Trichlorobenzene	mg/kg	6	103	6%	0.67
Volatile Organic Compounds	1,2-Dichlorobenzene	mg/kg	9	103	9%	0.51
Volatile Organic Compounds	1,2-Dichloroethene (total)	mg/kg	11	31	35%	4.5
Volatile Organic Compounds	1,3-Dichlorobenzene	mg/kg	3	103	3%	0.002
Volatile Organic Compounds	1,4-Dichlorobenzene	mg/kg	3	103	3%	0.23
Volatile Organic Compounds	2-Butanone (Methyl Ethyl Ketone)	mg/kg	59	134	44%	9.3
Volatile Organic Compounds	2-Hexanone (Methyl Butyl Ketone)	mg/kg	5	134	4%	0.18
Volatile Organic Compounds	4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	mg/kg	9	134	7%	2.6
Volatile Organic Compounds	Acetone	mg/kg	71	134	53%	1.9
Volatile Organic Compounds	Benzene	mg/kg	49	134	37%	3.4
Volatile Organic Compounds	Carbon disulfide	mg/kg	43	134	32%	0.05
Volatile Organic Compounds	Chlorobenzene	mg/kg	12	134	9%	0.086
Volatile Organic Compounds	Chloroethane	mg/kg	1	134	1%	0.0033
Volatile Organic Compounds	Chloroform (Trichloromethane)	mg/kg	3	134	2%	0.004
Volatile Organic Compounds	cis-1,2-Dichloroethene	mg/kg	57	103	55%	380
Volatile Organic Compounds	Cyclohexane	mg/kg	27	103	26%	25
Volatile Organic Compounds	Ethylbenzene	mg/kg	56	134	42%	600
Volatile Organic Compounds	Isopropylbenzene (Cumene)	mg/kg	34	103	33%	34
Volatile Organic Compounds	Methyl acetate	mg/kg	17	103	17%	1
Volatile Organic Compounds	Methylcyclohexane	mg/kg	38	103	37%	56
Volatile Organic Compounds	Methylene chloride (Dichloromethane)	mg/kg	48	141	34%	0.078
Volatile Organic Compounds	Styrene	mg/kg	1	134	1%	0.14
Volatile Organic Compounds	Tetrachloroethene	mg/kg	12	116	10%	0.17
Volatile Organic Compounds	Toluene	mg/kg	86	141	61%	1900
Volatile Organic Compounds	trans-1,2-Dichloroethene	mg/kg	24	103	23%	1.1
Volatile Organic Compounds	Trichloroethane	mg/kg	15	25	60%	0.093
Volatile Organic Compounds	Trichloroethene	mg/kg	74	116	64%	2500
Volatile Organic Compounds	Trichlorofluoromethane (CFC-11)	mg/kg	2	103	2%	0.12

SUMMARY OF DETECTIONS - SOIL
RACER ELYRIA
1400 LOWELL STREET
ELYRIA, OHIO

Compound Group	Analyte Detected	Units	# of Detected	# Sampled	Frequency of Detections	Maximum Concentration
Volatile Organic Compounds	Vinyl chloride	mg/kg	33	134	25%	1.4
Volatile Organic Compounds	Xylene (total)	mg/kg	71	134	53%	4500

mg/kg - milligrams per kilogram

APPENDIX B
Suggested Annual Reporting Format

RISK MITIGATION PLAN – ANNUAL REPORTING FORMAT
DOCUMENTATION OF EXCAVATION / GROUNDWATER EXTRACTION ACTIVITIES
RACER Elyria – Elyria, Ohio

Contractor _____

Date(s) of Project Specific Work Plan and Task Specific Health and Safety Plans Submittal to the Property Owner and the Ohio Environmental Protection Agency

_____

Location of Excavation / Groundwater Extraction Activities (Note Use Restricted Areas, describe in writing, and attach plans):

_____
_____
_____
_____

Duration of Excavation / Groundwater Extraction Activities

_____
_____
_____

Nature and Extent of Excavation / Groundwater Extraction Activities (Note utility repair, utility installations, etc., and attach plans)

_____
_____
_____

Pre-Excavation / Groundwater Extraction Survey Completed

Yes:_____ No:_____

Risk Management Plan and HASP Present During Excavation / Groundwater Extraction Activities

Yes:_____ No:_____

Observation / Comments During Excavation / Groundwater Extraction Activities (Attach additional notes, sketches, and documentation asnecessary):

_____
_____
_____

Ground surface restored per plans

Yes:_____ No:_____

Post Excavation / Groundwater Extraction Survey Completed

Yes:_____ No:_____

APPENDIX F
Basis of Costs

TABLE F1
ENGINEER'S OPINION OF COST
RACER TRUST ELYRIA
PCB REMOVAL (ALT 2)
ELYRIA, OHIO

Item	Description	Measurement for Payment	Quantity	Unit Price	Total Cost	Notes/Assumptions
1	**Submittals, Preconstruction and Permitting**	Lump Sum	0	$ 5,000.00	$ -	
2	**Mobilization**					
2a	Silt Fencing	Linear Foot	0	$ 0.94	$ -	
	Site Grubbing and Tree Clearance	Lump Sum	0	$ 5,000.00	$ -	Rough estimate for clearance
	Temporary Facilities	Lump Sum	0	$ 5,000.00	$ -	Estimate
	Equipment Mobilization	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Generator	Week	0	$ 200.00	$ -	
3	**On-Site Soil Activities**					
3a	Soil Removal and Management	Cubic Yard	890	$ 13.50	$ 12,015.00	
3b	Test Pitting	Lump Sum	0	$ 5,000.00	$ -	Rough estimate
4	**Transport and Disposal of Site Soil and Demolition Debris**					
4a	Non-Hazardous Material	Ton	1335	$ 37.50	$ 50,062.50	1.5 tons/cy
4b	Hazardous Material	Ton	0	$ 120.00	$ -	Rough estimate of cost for PCB affected soils
5	**Final Cover Materials**					
5a	Geotextile	Square Yard	1333	$ 1.50	$ 2,000.00	
5b	Vegetative Soil	Ton	1001	$ 27.50	$ 27,534.38	
5c	Topsoil	Ton	334	$ 35.00	$ 11,681.25	
5d	Aggregate	Ton	0	$ 25.70	$ -	
6	**Final Cover Placement and Grading**					
6a	Onsite Stockpiled Soils	Cubic Yard	0	$ 7.50	$ -	
6b	Vegetative Soil	Ton	1001	$ 8.60	$ 8,610.75	
6b	Topsoil	Ton	334	$ 15.00	$ 5,006.25	
6c	Aggregate	Ton	0	$ 17.50	$ -	
7	**Restoration**					
7a	Chain Link Fence and Gate	Lump Sum	0	$ 7,500.00	$ -	
7b	Seeding	Acre	0.28	$ 7,405.20	$ 2,040.00	
8	**Site Clearance and Demobilization**	Lump Sum	0	$ 8,000.00	$ -	
9	**Contingency Bid Items**					
9a	Street Sweeper	Day			$ -	
9b	Other				$ -	
				TOTAL	**$ 118,950.13**	
	Construction Phase Oversight, Engineering, and Project Management Costs					
	Construction Oversight	Day	0	$ 2,500.00	$ -	1 week construction duration
	Air Monitoring	Day	0	$ 1,975.00	$ -	
	Dust Monitoring Equipment/Sampling	Lump Sum	0	$ 10,000.00	$ -	
	Engineering Support and Project Management	Lump Sum	0	$ 5,000.00	$ -	Project Support
				TOTAL	**$ -**	

20% Contingency	$ 23,790.03
FINAL TOTAL:	**$ 142,740.15**

TABLE F2
ENGINEER'S OPINION OF COST
RACER TRUST ELYRIA
AOC-2 REMOVAL
ELYRIA, OHIO

Item	Description	Measurement for Payment	Quantity	Unit Price	Total Cost	Notes/Assumptions
1	**Submittals, Preconstruction and Permitting**	Lump Sum	0	$ 5,000.00	$ -	
2	**Mobilization**					
2a	Silt Fencing	Linear Foot	0	$ 0.94	$ -	
	Site Grubbing and Tree Clearance	Lump Sum	0	$ 5,000.00	$ -	Rough estimate for clearance
	Temporary Facilities	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Equipment Mobilization	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Generator	Week	0	$ 200.00	$ -	
3	**On-Site Soil Activities**					
3a	Soil Removal and Management	Cubic Yard	1230	$ 13.50	$ 16,605.00	
3b	Test Pitting	Lump Sum	0	$ 5,000.00	$ -	Rough estimate
4	**Transport and Disposal of Site Soil and Demolition Debris**					
4a	Non-Hazardous Material	Ton	1845	$ 37.50	$ 69,187.50	
4b	Hazardous Material	Ton	0	$ 120.00	$ -	
5	**Final Cover Materials**					
5a	Geotextile	Square Yard	1833	$ 1.50	$ 2,750.00	
5b	Vegetative Soil	Ton	1384	$ 27.50	$ 38,053.13	
5c	Topsoil	Ton	461	$ 35.00	$ 16,143.75	
5d	Aggregate	Ton	0	$ 25.70	$ -	
6	**Final Cover Placement and Grading**					
6a	Onsite Stockpiled Soils	Cubic Yard	0	$ 7.50	$ -	
6b	Vegetative Soil	Ton	1384	$ 8.60	$ 11,900.25	
6b	Topsoil	Ton	461	$ 15.00	$ 6,918.75	
6c	Aggregate	Ton	0	$ 17.50	$ -	
7	**Restoration**					
7a	Chain Link Fence and Gate	Lump Sum	0	$ 7,500.00	$ -	
7b	Seeding	Acre	0.38	$ 7,405.20	$ 2,805.00	
8	**Site Clearance and Demobilization**	Lump Sum	0	$ 8,000.00	$ -	
9	**Contingency Bid Items**					
9a	Street Sweeper	Day			$ -	
9b	Other				$ -	
				TOTAL	**$ 164,363.38**	
	Construction Phase Oversight, Engineering, and Project Management Costs					
	Construction Oversight	Day	0	$ 2,500.00	$ -	1 week construction duration
	Air Monitoring	Day	0	$ 1,975.00	$ -	
	Dust Monitoring Equipment/Sampling	Lump Sum	0	$ 10,000.00	$ -	
	Engineering Support and Project Management	Lump Sum	0	$ 5,000.00	$ -	Project Support
				TOTAL	**$ -**	

20% Contingency	$ 32,872.68
FINAL TOTAL:	**$ 197,236.05**

TABLE F3
ENGINEER'S OPINION OF COST
RACER TRUST ELYRIA
AOC-6 REMOVAL
ELYRIA, OHIO

Item	Description	Measurement for Payment	Quantity	Unit Price	Total Cost	Notes/Assumptions
1	**Submittals, Preconstruction and Permitting**	Lump Sum	0	$ 5,000.00	$ -	
2	**Mobilization**					
2a	Silt Fencing	Linear Foot	0	$ 0.94	$ -	
	Site Grubbing and Tree Clearance	Lump Sum	0	$ 5,000.00	$ -	Rough estimate for clearance
	Temporary Facilities	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Equipment Mobilization	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Generator	Week	0	$ 200.00	$ -	
3	**On-Site Soil Activities**					
3a	Soil Removal and Management	Cubic Yard	300	$ 13.50	$ 4,050.00	
3b	Test Pitting	Lump Sum	0	$ 5,000.00	$ -	Rough estimate
4	**Transport and Disposal of Site Soil and Demolition Debris**					
4a	Non-Hazardous Material	Ton	450	$ 37.50	$ 16,875.00	
4b	Hazardous Material	Ton	0	$ 120.00	$ -	Rough estimate of cost for PCB affected soils
5	**Final Cover Materials**					
5a	Geotextile	Square Yard	356	$ 1.50	$ 533.33	
5b	Vegetative Soil	Ton	338	$ 27.50	$ 9,281.25	
5c	Topsoil	Ton	113	$ 35.00	$ 3,937.50	
5d	Aggregate	Ton	0	$ 25.70	$ -	
6	**Final Cover Placement and Grading**					
6a	Onsite Stockpiled Soils	Cubic Yard	0	$ 7.50	$ -	
6b	Vegetative Soil	Ton	338	$ 8.60	$ 2,902.50	
6b	Topsoil	Ton	113	$ 15.00	$ 1,687.50	
6c	Aggregate	Ton	0	$ 17.50	$ -	
7	**Restoration**					
7a	Chain Link Fence and Gate	Lump Sum	0	$ 7,500.00	$ -	
7b	Seeding	Acre	0.07	$ 7,405.20	$ 544.00	
8	**Site Clearance and Demobilization**	Lump Sum	0	$ 8,000.00	$ -	
9	**Contingency Bid Items**					
9a	Street Sweeper	Day			$ -	
9b	Other				$ -	
				TOTAL	**$ 39,811.08**	
	Construction Phase Oversight, Engineering, and Project Management Costs					
	Construction Oversight	Day	0	$ 2,500.00	$ -	1 week construction duration
	Air Monitoring	Day	0	$ 1,975.00	$ -	
	Dust Monitoring Equipment/Sampling	Lump Sum	0	$ 10,000.00	$ -	
	Engineering Support and Project Management	Lump Sum	0	$ 5,000.00	$ -	Project Support
				TOTAL	**$ -**	

20% Contingency	$ 7,962.22
FINAL TOTAL:	**$ 47,773.30**

TABLE F4
ENGINEER'S OPINION OF COST
RACER TRUST ELYRIA
AOC-7 REMOVAL
ELYRIA, OHIO

Item	Description	Measurement for Payment	Quantity	Unit Price	Total Cost	Notes/Assumptions
1	**Submittals, Preconstruction and Permitting**	Lump Sum	0	$ 5,000.00	$ -	
2	**Mobilization**					
2a	Silt Fencing	Linear Foot	0	$ 0.94	$ -	
	Site Grubbing and Tree Clearance	Lump Sum	0	$ 5,000.00	$ -	Rough estimate for clearance
	Temporary Facilities	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Equipment Mobilization	Lump Sum	0	$ 10,000.00	$ -	Estimate
	Generator	Week	0	$ 200.00	$ -	
3	**On-Site Soil Activities**					
3a	Soil Removal and Management	Cubic Yard	240	$ 13.50	$ 3,240.00	
3b	Test Pitting	Lump Sum	0	$ 5,000.00	$ -	Rough estimate
4	**Transport and Disposal of Site Soil and Demolition Debris**					
4a	Non-Hazardous Material	Ton	360	$ 37.50	$ 13,500.00	
4b	Hazardous Material	Ton	0	$ 120.00	$ -	Rough estimate of cost for PCB affected soils
5	**Final Cover Materials**					
5a	Geotextile	Square Yard	356	$ 1.50	$ 533.64	
5b	Vegetative Soil	Ton	270	$ 27.50	$ 7,425.00	
5c	Topsoil	Ton	90	$ 35.00	$ 3,150.00	
5d	Aggregate	Ton	0	$ 25.70	$ -	
6	**Final Cover Placement and Grading**					
6a	Onsite Stockpiled Soils	Cubic Yard	0	$ 7.50	$ -	
6b	Vegetative Soil	Ton	270	$ 8.60	$ 2,322.00	
6b	Topsoil	Ton	90	$ 15.00	$ 1,350.00	
6c	Aggregate	Ton	0	$ 17.50	$ -	
7	**Restoration**					
7a	Chain Link Fence and Gate	Lump Sum	0	$ 7,500.00	$ -	
7b	Seeding	Acre	0.07	$ 7,405.20	$ 544.31	
8	**Site Clearance and Demobilization**	Lump Sum	0	$ 8,000.00	$ -	
9	**Contingency Bid Items**					
9a	Street Sweeper	Day			$ -	
9b	Other				$ -	
				TOTAL	**$ 32,064.96**	
	Construction Phase Oversight, Engineering, and Project Management Costs					
	Construction Oversight	Day	0	$ 2,500.00	$ -	1 week construction duration
	Air Monitoring	Day	0	$ 1,975.00	$ -	
	Dust Monitoring Equipment/Sampling	Lump Sum	0	$ 10,000.00	$ -	
	Engineering Support and Project Management	Lump Sum	0	$ 5,000.00	$ -	Project Support
				TOTAL	**$ -**	

20% Contingency	$ 6,412.99
FINAL TOTAL:	**$ 38,477.95**

TABLE F5
ENGINEER'S OPINION OF COST
RACER TRUST ELYRIA
ENHANCED COVER OF HISTORICALLY COVERED SETTLING BASIN
ELYRIA, OHIO

Item	Description	Measurement for Payment	Quantity	Unit Price	Total Cost	Notes/Assumptions
1	**Submittals, Preconstruction and Permitting**	Lump Sum	1	$ 5,000.00	$ 5,000.00	
2	**Mobilization**					
2a	Silt Fencing	Linear Foot	5000	$ 0.94	$ 4,700.00	
	Site Grubbing and Tree Clearance	Lump Sum	1	$ 5,000.00	$ 5,000.00	Rough estimate for clearance
	Temporary Facilities	Lump Sum	1	$ 10,000.00	$ 10,000.00	Estimate
	Equipment Mobilization	Lump Sum	1	$ 10,000.00	$ 10,000.00	Estimate
	Generator	Week	4	$ 200.00	$ 800.00	
3	**On-Site Soil Activities**					
3a	Soil Removal and Management	Cubic Yard	0	$ 13.50	$ -	
3b	Test Pitting	Lump Sum	1	$ 5,000.00	$ 5,000.00	Rough estimate
4	**Transport and Disposal of Site Soil and Demolition Debris**					
4a	Non-Hazardous Material	Ton	0	$ 37.50	$ -	
4b	Hazardous Material	Ton	0	$ 120.00	$ -	
5	**Final Cover Materials**					
5a	Geotextile	Square Yard	16155	$ 1.50	$ 24,232.83	
5b	Vegetative Soil	Ton	0	$ 27.50	$ -	
5c	Topsoil	Ton	4039	$ 35.00	$ 141,358.19	
5d	Aggregate	Ton	0	$ 25.70	$ -	
6	**Final Cover Placement and Grading**					
6a	Onsite Stockpiled Soils	Cubic Yard	0	$ 7.50	$ -	
6b	Vegetative Soil	Ton	0	$ 8.60	$ -	
6b	Topsoil	Ton	4039	$ 15.00	$ 60,582.08	
6c	Aggregate	Ton	0	$ 17.50	$ -	
7	**Restoration**					
7a	Chain Link Fence and Gate	Lump Sum	0	$ 7,500.00	$ -	
7b	Seeding	Acre	3.34	$ 7,405.20	$ 24,717.49	
8	**Site Clearance and Demobilization**	Lump Sum	1	$ 8,000.00	$ 8,000.00	
9	**Contingency Bid Items**					
9a	Street Sweeper	Day			$ -	
9b	Other				$ -	
				TOTAL	**$ 299,390.60**	
	Construction Phase Oversight, Engineering, and Project Management Costs					
	Construction Oversight	Day	25	$ 2,500.00	$ 62,500.00	4 Week Construction Duration + 1 week mob. and demob.
	Air Monitoring	Day	15	$ 1,975.00	$ 29,625.00	
	Dust Monitoring Equipment/Sampling	Lump Sum	1	$ 10,000.00	$ 10,000.00	
	Engineering Support and Project Management	Lump Sum	1	$ 15,000.00	$ 15,000.00	
				TOTAL	**$ 117,125.00**	

20% Contingency	$ 83,303.12
FINAL TOTAL:	**$ 499,818.72**

TABLE F6
ENGINEER'S OPINION OF COST
RACER TRUST ELYRIA
ACM BULK REMOVAL (ALT 2)
ELYRIA, OHIO

Item	Description	Measurement for Payment	Quantity	Unit Price	Total Cost	Notes/Assumptions
1	**Submittals, Preconstruction and Permitting**	Lump Sum	1	$ 5,000.00	$ 5,000.00	
2	**Mobilization**					
2a	Silt Fencing	Linear Foot	5000	$ 0.94	$ 4,700.00	
	Site Grubbing and Tree Clearance	Lump Sum	1	$ 5,000.00	$ 5,000.00	Rough estimate for clearance
	Temporary Facilities	Lump Sum	1	$ 10,000.00	$ 10,000.00	Estimate
	Equipment Mobilization	Lump Sum	1	$ 10,000.00	$ 10,000.00	Estimate
	Generator	Week	4	$ 200.00	$ 800.00	
3	**On-Site Soil Activities**					
3a	Soil Removal and Management	Cubic Yard	6777	$ 13.50	$ 91,485.75	
3b	Test Pitting	Lump Sum	1	$ 5,000.00	$ 5,000.00	Rough estimate
4	**Transport and Disposal of Site Soil and Demolition Debris**					
4a	Non-Hazardous Material	Ton	10165	$ 37.50	$ 381,187.50	
4b	Hazardous Material	Ton		$ 120.00	$ -	All disposed soil considered hazardous for estimate
5	**Final Cover Materials**					
5a	Geotextile	Square Yard	8708	$ 1.50	$ 13,061.67	
5b	Vegetative Soil	Ton	7988	$ 27.50	$ 219,673.82	
5c	Topsoil	Ton	2177	$ 35.00	$ 76,193.06	
5d	Aggregate	Ton	0	$ 25.70	$ -	
6	**Final Cover Placement and Grading**					
6a	Onsite Stockpiled Soils	CY	0	$ 7.50	$ -	
6b	Vegetative Soil	Ton	7988	$ 8.60	$ 68,697.99	
6b	Topsoil	Ton	2177	$ 15.00	$ 32,654.17	
6c	Aggregate	Ton	0	$ 17.50	$ -	
7	**Restoration**					
7a	Chain Link Fence and Gate	Lump Sum	0	$ 7,500.00	$ -	
7b	Seeding	Acre	1.80	$ 7,405.20	$ 13,322.90	
8	**Site Clearance and Demobilization**	Lump Sum	1	$ 8,000.00	$ 8,000.00	
9	**Contingency Bid Items**					
9a	Street Sweeper	Day			$ -	
9b	Other				$ -	
				TOTAL	**$ 944,776.85**	
	Construction Phase Oversight, Engineering, and Project Management Costs					
	Construction Oversight	Day	25	$ 2,500.00	$ 62,500.00	4 Week Construction Duration + 1 week mob. and demob.
	Air Monitoring	Day	15	$ 1,975.00	$ 29,625.00	
	Dust Monitoring Equipment/Sampling	Lump Sum	1	$ 10,000.00	$ 10,000.00	
	Engineering Support and Project Management	Lump Sum	1	$ 15,000.00	$ 15,000.00	
				TOTAL	**$ 117,125.00**	

20% Contingency	$ 212,380.37
FINAL TOTAL:	**$ 1,274,282.22**