REMEDIATION WORK PLAN

Revision 1

Former Exide Corporation
303 Water Street
Logansport, Indiana 46947

Indiana Brownfields #4221108
State Cleanup #0000971

June 28, 2024

BCA Project No. 24-066

BCA™ Environmental Consultants

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Prepared for:
City of Logansport
Cooperative Agreement No. BF-00E03545

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EXECUTIVE SUMMARY

Source of Contamination

The Former Exide Corporation facility is located at 303 Water Street in Logansport, Indiana (Subject Site) and consists of a single parcel totaling approximately 17.41 acres of land located within city limits. The Subject Site operated as a rail yard and was part of the Terre Haute & Indianapolis Railroad – Vandalia Line from at least 1885 – 1930s. Former railroad operations associated with the Subject Site included rail sidings and maintenance facilities (roundhouse). The Site also operated as the National Steel Construction Company – Logansport Plant, manufacturers of steel products from at least 1949 to the late 1950's. General Tire reportedly operated the plant until it was purchased by Exide in 1959. Exide operated the Subject Site as a lead-acid storage battery manufacturing facility for the automotive industry from about 1960 into the 1990's, and at a limited capacity before fully shutting down in 2009. The factory buildings were demolished in 2016 and the Subject Site has since been vacant. The area near the Subject Site is largely residential land with other industrial properties nearby. The Site is located on the south side of Water Street, between Aster Street and residential properties to the west and commercial properties to the east. The former Logansport & Eel River Short Line railroad (abandoned) adjoins along the south side of the Site with the former Trelleborg Automotive property beyond. Residential and commercial properties are located to the north across Water Street. Aside from the former factory building's concrete floor and footprint, no structures exist on the Subject Site.

Initial investigations concerning the Subject Site were conducted from 2020 to 2022. The investigations identified the presence of lead above the IDEM Risk-based Closure Guide (RbCG or R2) Excavation Direct Contact Human Health Levels (EDC HHLs) in the shallow soils throughout the north half of the Subject Site around the former building, and the presence of chlorinated aliphatic hydrocarbons (CAHs), specifically trichloroethene (TCE) in the soil and groundwater at the east end of the former factory building. The potential is present for the TCE to migrate off-site in excess of the IDEM R2 HHLs. The potential for vapor migration and vapor intrusion to adjoining properties to the east has also been identified. There is also potential future direct contact exposure of site occupants to the lead in shallow soil.

The nature and extent of impacted soil and groundwater has been fully delineated. However, soil gas and the potential for vapor encroachment or vapor intrusion into adjoining properties have not been fully investigated.

Exposure Pathways

Currently, no exposure pathways are known to be complete. Potential (not confirmed) exposure pathways are limited to vapor intrusion to adjoining commercial property.

Potential future exposure pathways are limited to site occupants or excavation worker direct contact exposure to lead and CAHs in soil.

Data Gap Investigations

Data gaps for which further investigation is recommended include:

1. Vertical and horizontal extents of TCE hotspot around HS-2 20W is not yet fully delineated.

Recommended Remediation

The recommended remediation is described in detail in Section 6 of this RWP. To summarize, the recommended remediation includes:

- Removal of the remaining structure (concrete slab and foundations)
- Insitu soil treatment for all areas where lead impacted soils exceed 1,380 mg/kg.
- Excavation and removal of all lead impacted soils above 2x the IDEM R2 EDC HHL and other high-impacted soils (below 2x R2 EDC HHL) until the average concentration in the impacted area is less than the industrial direct contact HHL.
- Excavation and removal of TCE impacted soils (at both the HS-1 and HS-5 hotspots) above the IDEM R2 EDC HHLs.
- Application of soil amendment in the HS-1 and HS-5 TCE impacted areas.
- Use of institutional controls (ICs) to prohibit future use of groundwater for potable purposes, including an Environmental Restrictive Covenant (ERC) for the Subject Site. A current local ordinance exists that restricts the installation and use of potable water wells within Logansport City limits and no privately-owned drinking water wells have been identified within the area around the Subject Site. Additional ICs may be used as necessary to address any groundwater risks post remediation.
- Use of ERCs on the Subject Site requiring the use of vapor mitigation systems such as vapor barriers (passive) and sub-slab depressurization systems (active) for any future structure(s) situated in the east end of the Subject Site. Alternatively, demonstrate through post-remediation soil gas sampling that vapor mitigation is not necessary.
- Install monitoring wells to conduct groundwater sampling to monitor for changes to the limits and concentrations within the TCE plume.

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List of Abbreviations

AOC	Area of Contamination (EPA Policy)
BCA	BCA Environmental Consultants, LLC
BGS	Below Ground Surface
CAHs	Chlorinated Aliphatic Hydrocarbons
CV	Conduit Vapor
CVOCs	Chlorinated Volatile Organic Compounds
EC	Engineering Control
EPA	United States Environmental Protection Agency
ERC	Environmental Restrictive Covenant
ESA	Environmental Site Assessment
GPM	Gallons per Minute
GPS	Global Positioning System
GW	Groundwater
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
HHL	Human Health Level (replaced by PLs)
IC	Institutional Control
IDEM	Indiana Department of Environmental Management
LCS	Laboratory Control Standard
mg/kg	milligrams per kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTGW	Migration to Groundwater – from IDEM 2012 Remediation Closure Guide
PID	Photo-Ionization Detector
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
PL	Published Level (from IDEM R2)
R2 or RbCG	Risk-based Closure Guide or R2
RbCG EDC-PL	Excavation Direct Contact Published Level (Soil)
RbCG IDC-PL	Commercial/Industrial Direct Contact Published Level (Soil)
RbCG RD-PL	Residential Direct Contact Published Level (Soil)
RbCG RGWPL	Residential Groundwater Published Level (Groundwater)
RbCG V PL	Vapor Exposure Published Levels (Soil Gas, Indoor Air)
RCRA	Resource Conservation and Recovery Act
RECs	Recognized Environmental Conditions
RPD	Relative Percent Difference
RoW	Right of Way
SAP	Sampling and Analysis Plan
SGe	Exterior Soil Gas
SGss	Sub-slab Soil Gas
SLs	Screening Levels (replaced by HHLs)
SOP	Standard Operating Procedures
SVOCs	Semi-Volatile Organic Compounds
ug/kg	micrograms per kilogram
ug/L	micrograms per Liter
USCS	Unified Soil Classification System
USTs	Underground Storage Tanks
VFC	IDEM Virtual File Cabinet
VI	Vapor Intrusion
VOCs	Volatile Organic Compounds
WHPA	Well Head Protection Area

1.0 INTRODUCTION

1.1 Project Background

The Subject Site operated as a rail yard and was part of the Terre Haute & Indianapolis Railroad – Vandalia Line from at least 1885 – 1930s. Former railroad operations associated with the Subject Site included rail sidings and maintenance facilities (roundhouse). The Subject Site also operated as the National Steel Construction Company – Logansport Plant, manufacturers of steel products from at least 1949 to the late 1950's. General Tire reportedly operated the plant until it was purchased by Exide in 1959. Exide operated the Subject Site as a lead-acid storage battery manufacturing facility for the automotive industry from 1960 into the 1990's, and at a limited capacity before fully shutting down in 2009. The factory buildings were demolished in 2016 and the Subject Site has since been vacant. Initial site investigations concerning the Subject Site were conducted from 2020 to 2022 and included a Phase I ESA, Phase II ESA, Supplemental Phase II ESA, and 2nd Supplemental Phase II ESA, and additional soil delineation was conducted in 2023. The investigations identified extensive lead impacts in the surface and shallow sub-surface soils around the former factory building and the presence of chlorinated aliphatic hydrocarbons (CAHs) in the soil and groundwater beneath the east end of the former factory building. The potential for vapor migration and vapor intrusion to adjoining structures have also been identified.

1.2 Project Identification

The Subject Site consists of a single large parcel totaling approximately 17.41 acres of land located within the City of Logansport, Indiana (Figures 1 & 2), located on the south side of Water Street, between Aster Street and residential properties to the west and commercial properties to the east. The former Logansport & Eel River Short Line railroad (abandoned) adjoins along the south side of the Subject Site with the former Trelleborg Automotive property beyond. Residential and commercial properties are located to the north across Water Street. Aside from the former factory building's concrete floor and footprint, no structures exist on the Subject Site. Overgrown gravel lots are located on the east and west sides of the former factory building.

The Subject Site is currently owned by the City of Logansport Site contacts for this remediation project are:

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1.3 Historical Environmental Investigations

1.3.1 Phase I ESA

A Phase I Environmental Site Assessment (ESA) of the Subject Site was conducted for the City of Logansport, by BCA Environmental Consultants, LLC (BCA), dated September 25, 2020. The Phase I ESA was funded through a U.S. EPA Brownfield Assessment Grant to the City of Logansport (Cooperative Agreement No. BF-00E02313). The Phase I ESA identified the following RECs:

- The Subject Site had been used as a rail maintenance yard and rail lines for over 60 years. There is minor risk of spillage from railroad operations along the main lines and sidings.
- Coal ash and cinders (CAC) were observed on the ground surface along the southern fence line of the Subject Site.
- Herbicides were commonly used on rail lines to control vegetation.
- Former operations as a steel product manufacturer from about 1948 to 1959
- Former operations as lead-acid battery manufacturing facility from 1960 until 1989.
- Lead impacts have been found in surface soils on and around the perimeter of the Site.

1.3.2 Phase II ESA

A Phase II ESA of the Subject Site was conducted by BCA for the City of Logansport, with the report dated June 1, 2021. The investigation was also funded through the EPA Grant (Cooperative Agreement No. BF-00E02313). The Phase II identified shallow soil (0-4' depths) impacts from lead, exceeding the then current IDEM Remediation Closure Guide (RCG) industrial direct contact screening level (IDC SL) and excavation direct contact SLs (ExDC SL or ESL) in 18 sampled locations throughout the Site, including samples collected from within historical excavation/remediation areas. Trichloroethene (TCE) was detected in groundwater samples exceeding the RCG Industrial Vapor Intrusion Groundwater Screening Level (I-VIGWSL) at one location and exceeded the RCG Residential VIGWSL at a second (VIGWSLs are no longer applicable for closure). The two probes were located near the eastern property line away from the historical production area and the groundwater flow is likely to the south or southeast. An auto repair facility is located to the north across Water Street and a Pepsi distribution site adjoins Exide to the east. Neither was identified in the Phase I ESA as a REC for chlorinated solvents, but both were identified as potential sources or contributors (in addition to historical Exide operations) to the TCE. Several groundwater samples exceeded the RCG RGSL for lead in the unfiltered samples. Field filtered samples from 5 of the sampled locations were analyzed for lead and exceeded the RCG RGSL in four

(4) of those samples. Recommendations for additional investigation based on the results of the Phase II ESA included:

- Determine the extents of lead in excess of the RCG ESLs identified in the shallow soils.
- Install permanent monitoring wells to confirm the presence or absence of lead and arsenic in the groundwater.
- Investigate further the TCE identified in the groundwater samples from the east end of the Subject Site.

1.3.3 Supplemental Phase II ESA

Based on the results of the 2021 Phase II ESA, a Supplemental Phase II ESA of the Subject Site was conducted by BCA for the City of Logansport, with the report dated August 15, 2022 (VFC # 83371930). The investigation was funded through the EPA Grant (Cooperative Agreement No. BF-00E02875). The Supplemental Phase II included advancing 21 soil and groundwater probes and five (5) permanent monitoring wells on the Subject Site at locations based on the recommendations of the Phase II ESA and to delineate the extent of the impacts. Soil samples were collected from each boring location, and groundwater was sampled from the six (6) designated probe and five (5) monitoring well locations. Soil was analyzed for lead by EPA Method 6010, and groundwater samples were analyzed for VOCs by EPA Method 8260, and lead and arsenic by EPA Method 6010. Based on field observations made and XRF screening during the Phase II activities, twenty-two (22) surface soil samples were also collected and analyzed for lead only. Acidic odors and discoloration of the gravel and surface was noted at and around the former Acid Charge Area during the May 25, 2022, site visit. Soil pH was tested on three samples.

Shallow sub-surface and surface soils at some locations on the eastern portion and the northern edge and along the Water Street right-of-way was found to be impacted by metals and are above the RCG RDCSL for lead in several locations. Surface and shallow sub-surface soils in areas of the former battery manufacturing operations were found to be impacted by lead in excess of the RCG ESL at one location near the southern fence.

Groundwater exceeded the former residential VIGWSL for TCE in one location, and the RCG RGWSL at one location near the northeastern property line. In addition to on-site sources, off-site operations could potentially have contributed to the TCE. However, borings SB-21 and SB-22, located in the upgradient direction to the northeast and northwest of SB-23 and MW-5, were below detection limits for VOCs, suggesting that migration from an upgradient, off-site source is unlikely.

Although field observations of the Acid Charge Area suggested impacts, the soil pH at one location did not show significant impact. However, acid impacts at other locations nearby could not be ruled out.

Recommendations based on the results of the Supplemental Phase II ESA included:

- Determine the extents of lead in excess of the RCG ESLs identified in the shallow soils defined by sample SB-30.
- Further delineate the extent of lead in soils near and beneath the footprint of the building.
- Investigate further the TCE identified in the groundwater samples from the northeast end of the Subject Site.
- Further characterize the possible acid release at and around the Acid Charge Area.

1.3.4 2nd Supplemental Phase II ESA

Based on the results of the 2022 Supplemental Phase II ESA, a 2nd Supplemental Phase II ESA of the Subject Site was conducted by BCA for the City of Logansport, with the report dated November 8, 2022. The investigation was funded through the EPA Grant (Cooperative Agreement No. BF-00E02875). The subsurface investigation was conducted in two phases on September 9th and 23rd 2022 (soil gas survey) and on October 14, 2022, (soil sampling) for the purpose of determining subsurface environmental conditions on the Subject Site. The subsurface investigation included installing 26 shallow soil gas samplers to investigate further the TCE identified in the groundwater samples from the northeast end of the Subject Site, at or near a former loading dock area. The investigation also included advancing seven (7) soil probes on the Subject Site to attempt to identify the source of the VOCs and to further delineate the lead impacts identified in the 2021 Phase II and 2022 Supplemental Phase II ESAs.

Based on the results of the soil gas survey, four (4) soil probes (HS-1 through HS-4) were located within the soil gas hot spots and the collected soil samples were analyzed for VOCs by EPA Method 8260. The remaining three (3) soil probes (SB-42 through SB-44) were located in the area between SB-8, SB-26, and SB-28 where no sample data was collected during the previous investigations, and soil samples analyzed for lead by EPA Method 6010. In addition to the probes, three (3) surface material samples were collected from the former Acid Charge Area and analyzed for pH via method 9045C. The analytical results were compared to IDEM's R2 Residential Direct Contact (RDC), Commercial/Industrial Direct Contract (IDC), and Excavation Direct Contact (EDC) HHLs (RbCG Risk Screening Table, Table 1: Human Health Levels - 2022).

TCE was detected above the R2 Residential SGe HHL in three of the 23 shallow soil gas sample locations, exceeded the Industrial SGe HHL in one location, and the Large Industrial SGe HHL in one location. TCE was also detected above the industrial Sub-slab Soil Gas (SGss) HHL in one SGss location, situated approximately 60 feet away from the highest TCE concentration in the SGe samples, but still in the former loading dock area. The two locations may be independent hotspots, or they may represent a single continuous source area.

Field screening of the subsequent soil probes HS-1 through HS-4 suggested the presence of VOCs in the soil cores from HS-1 at 0-2' and 5-6'. TCE was found to exceed the R2 IDC HHL in the soil samples from HS-1 (2') and HS-1 (6'). Boring HS-1 was located within 2 feet of the SGe point where TCE was above the R2 Large Industrial SGe HHL. Several VOCs, including c-DCE, PCE, 1,1,1-TCA, and 1,1,2-TCA were detected above IDEM's former RCG migration to groundwater screening levels. Many of these compounds, particularly 1,1,1-TCA, were detected in the soil gas samples as well. HS-1 was located along the south side of a former loading dock area. Although the TCE soil gas concentrations at the SGss point are similar to those at the high SGe point, soil concentrations are likely much lower since the concrete slab often causes higher soil gas concentrations, it was concluded that the TCE soil concentration at HS-1 likely do not extend far.

Surface and shallow sub-surface soils showed lead impacts exceeding the R2 RDC HHL in the soil sample from SB-42 (1.0 – 2.0'), the IDC HHL in the soil sample from SB-42 (0-1.0'), and the EDC HHL in the samples from SB-43 (1.0-2.0'), SB-44 (0-1.0'). The data closed a data gap from previous investigations.

Field evidence of staining and odor suggested possible acid impacts throughout the former Acid Charge Area. Samples collected of the flooring material of the former Acid Charge Area (AC-1, AC-2, and AC-3) were analyzed for pH by the laboratory. Two of the three samples showed lowered pH levels, indicating impacts from residuals from the acid charge activities are present.

Recommendations based on the results of the 2nd Supplemental Phase II ESA included:

Develop a Remediation Work Plan (RWP) to:

- Remove / remediate lead impacted soils in excess of the RCG ISL to facilitate commercial redevelopment.
- Remove / remediate TCE impacted soils
- Monitor and/or remediate groundwater to the extent necessary.
- Remove acid impacted building materials.

- Establish use restrictions on the property to eliminate potential pathways of exposure to residual impacted soil and groundwater.
- Establish use restrictions on the property to eliminate potential vapor exposure pathways

1.3.5 3rd Supplemental Phase II ESA / Additional Soil Delineation

A 3rd Supplemental Phase II ESA on the Subject Site was conducted by BCA for the City of Logansport with a report dated April 5, 2024 to further delineate the extents of lead and TCE hotspots which will require remediation. Fieldwork was completed in two phases, the first occurring in late August to early September, and the second in early November 2023. The first phase included two (2) sewer gas samples, six (6) sub-slab soil gas samples, 48 soil probes, and 43 surface soil samples, while the second phase of this investigation included 54 soil probes and four (4) groundwater samples.

Sewer gas samples were collected from two manhole locations to the east and northeast of the Subject Site and were analyzed for VOCs by EPA method TO-15 LL. Sub-slab soil gas samples were collected at 20-foot step-outs from SGss-1 where TCE exceeded the commercial / industrial sub-slab HHL in the previous investigation, and west of the TCE hotspot at HS-1. Sewer gas samples were all below HHLs while two sub-slab samples exceeded the large commercial/industrial soil gas HHL, suggesting that a secondary TCE hotspot is present to the northwest of the loading dock area.

Groundwater samples were collected from four (4) locations (3 temporary / 1 permanent monitoring wells) to further define the areas impacted by TCE. TCE was found in all groundwater samples exceeding the R2 PLs with the highest located at the HS-5 hotspot (468 ug/L). PCE also slightly exceeded the R2 PLs at this location.

Results of soil sampling indicate that the TCE soil hotspot at HS-1 does not appear to be extensive in size and does not extend more than 10 feet laterally. TCE was also found to be present in the soil at HS-5, located approximately 100 feet to the north-northwest of HS-1. Soil and soil gas samples in between these two locations do not show exceedances for TCE, confirming that HS-5 is a secondary, independent hotspot. In the 2nd phase of the investigation, 20’ step out samples were collected around HS-5, and the northern and eastern probes were found to be free of TCE contamination. The soil sample from HS-5 20’W (3’) contained TCE at 1040 mg/kg, exceeding the R2 EDC PL, however samples from 4.5’ and 6’ bgs were both well below all R2 PLs. Further samples around HS-5 20’W were not collected, so delineation remains incomplete at this location, and the full extent of chlorinated compounds near HS-5 remains unknown.

To further the delineation for lead in the shallow soils, Initial samples in the first phase were placed around several hotspots found in previous Phase II investigations, however sample results suggested these hotspots were more extensive than previously thought.

In the second phase, soil samples were collected to fill in gaps and provide better sample density throughout the area south of the former building footprint. In total, about 750 soil samples were screened by a handheld XRF device, and 291 of those samples were analyzed for lead. Of the 291 samples, 103 exceeded the R2 IDC HHL (800 mg/kg) and 86 exceeded the R2 EDC HHL (1,000 mg/kg).

Areas to the east and northeast of the former building footprint were consistently above 1,000 mg/kg (in the top 12 to 18” bgs) and often much higher, with the average for this area exceeding 5,000 mg/kg. A large swath of the grassy area south of the building footprint is also impacted to a lesser extent. Shallow soils in these areas vary from a few hundred mg/kg up to about 5,000 mg/kg in the top 12” to 18”, with an average closer to about 2,000 mg/kg. The soils underneath the concrete slab at the southwest corner have also been found to be impacted by lead to about 5 feet bgs at highly variable levels ranging from a few hundred mg/kg up to a high of 40,500 mg/kg in one of the step-out samples around SB-9.

A total of 34 of the above soil samples were also analyzed for TCLP lead where lead total results varied from a low of 804 mg/kg up to 46,000 mg/kg. Of those TCLP samples, 23 exceeded the 5.0 mg/L threshold for characteristic hazardous waste. Almost all samples over 1760 mg/kg total lead failed TCLP while all samples under 1380 mg/kg passed TCLP. All six (6) samples from above 1380 to 1760 mg/kg passed TCLP.

1.4 Remedial Action Objectives

Performance-based and numerical Remedial Action Objectives (RAOs) are proposed for mitigation of the contamination beneath the Subject Site as described herein. If the numerical objectives are met, the performance objectives are considered to be fulfilled. Where numerical objectives are not met, performance-based objectives will be used to prevent completion of exposure pathways.

1.4.1 Performance-Based Remedial Action Objectives

Performance-based RAOs focus on the removal of contaminants and mitigation of current and future potential exposure or continued migration. These objectives are qualitative, yet are considered primary for the success of the remedial action:

a) The bulk of the lead in surface and shallow subsurface soils will be removed to the extent practical.
b) The bulk of the source of the TCE in the soils will be removed.
c) The presence of TCE in groundwater will be mitigated by removal of the bulk of the source and application of commercially available chemical reduction material.
d) Risk of intrusion of TCE vapors to future on-site and off-site improvements will be mitigated through source removal and application of chemical reduction materials.
e) Risk of harm from intrusion of TCE vapors to future occupied improvements will be controlled through the use of ICs.
f) ICs will be used to prohibit future production and use of groundwater.
g) Create and maintain a soil management plan.
h) Groundwater sampling will be conducted quarterly to monitor for changes to the limits and concentrations within the TCE plume and to demonstrate plume stability.

1.4.2 Numerical Remedial Action Objectives

The IDEM's R2 provides numeric Remediation PLs for the relevant exposure routes and land uses. The Subject Site is currently vacant and zoned for industrial use. Approximately half of the Subject Site will be redeveloped as a Maintenance Facility for the City Streets Department, while the remaining portion will be sold or leased for commercial or light industrial use. Certain R2 PLs were selected as the RAOs at the Subject Site, including the following:

a) Groundwater – Residential Groundwater PL.
b) Soil – Average in the 0-1', 1-2', and 2-4' intervals below the Commercial/ Industrial Direct Contact (IDC) PL.
c) Exterior soil gas – commercial

d) Subslab soil gas - commercial

Soils at the Site have exceeded the following numeric objectives:

a) Soil – IDC PL

For COCs detected at concentrations above applicable soil SLs, the following numerical remedial objectives for soil are provided:

Soil Remedial Action Objectives

	Units	**Lead**	**TCE**
CAS Number		156-59-2	7439-92-1
RbCG Residential Direct Contact Human Health Level*	mg/kg	**400**	**---**
RbCG Commercial/Industrial Direct Contact Human Health Level*	mg/kg	**800**	**---**
RbCG Excavation Direct Contact Human Health Level*	mg/kg	**1000**	**200**

Risk-based Closure Guide (R2), IDEM Published Levels Table 1: 2023

Groundwater and Soil Gas at the Subject Site have exceeded the following numeric objectives:

a) Groundwater – RGW PL
b) Soil Gas – Industrial shallow Exterior Soil Gas and Sub-Slab Soil Gas PLs

For VOCs detected at concentrations above applicable PLs, the following numerical remedial objectives for groundwater and soil gas are provided:

Groundwater and Vapor Intrusion Remedial Action Objectives

	Units	**TCE**	
CAS Number		79-01-6	
RbCG Residential Groundwater Human Health Level	ug/L	**5**	
RbCG Residential Exterior Soil Gas Human Health Levels	ug/m3	**20**	
RbCG Commercial/Industrial Exterior Soil Gas Human Health Levels	ug/m3	**90**	
RbCG **Large** Commercial/Industrial Exterior Soil Gas Human Health Levels	ug/m3	**900**	

Risk-based Closure Guide (R2), IDEM Published Levels Table 1: 2023

TCE in the shallow groundwater exceeds the IDEM R2 RG PLs on-site but samples indicate that contamination has not migrated off-site. Off-site, the risk of future human exposure to impacted groundwater is eliminated through City of Logansport Ordinance, Chapter 50, Art. IV, § 50-93(g) (Appendix A), which limits private ownership and use of groundwater wells for potable use within City limits. The City of Logansport Municipal

Utilities has confirmed that all the properties in the area are connected to the LMU Public Water Supply system; and, to its knowledge, there are no privately-owned wells in the area. There are no publicly owned water supply wells presenting an unacceptable risk of impact from TCE associated with the Subject Site. Any remaining risk to human exposure from TCE impacted groundwater may be controlled using additional ICs, as necessary, to further eliminate the need for RAOs for the groundwater to tap water pathway downgradient of the Subject Site.

1.5 Summary of Remedial Work Plan

To meet the RAOs for the Subject Site, a combination of remedial methods is proposed.

a) Lead impacted soils above 1,380 mg/kg will be treated to reduce leachability.
b) The lead impacted soils above 2x the EDC HHL (2000 mg/kg) will be excavated and removed as practicable. Additional soil (1500 to 2000 mg/kg) will be removed until the average soil concentration is less than the IDC HHL (800 mg/kg).
c) The TCE impacted soils greater than the EDC HHL (200 mg/kg) will be removed. The goal will be to remove all soil and most soil greater than about 1.0 mg/kg.
d) Application of In-Situ Chemical Reduction (ISCR) soil amendment in the TCE impacted area.
e) Use of institutional controls (ICs) to prohibit future use of groundwater for potable purposes, including an Environmental Restrictive Covenant (ERC) for the Subject Site and an existing Environmental Restrictive Ordinance (ERO).
f) Based on post-remediation soil gas and indoor air sampling, it is possible (though unlikely) that a vapor mitigation system (VMS) may be needed on the property to the east. In addition, a VMS may be needed on the Subject Site for future construction, which would be assured by placing an ERC on the Subject Site and,
g) Install monitoring wells and conduct quarterly groundwater sampling to monitor for changes to the limits and concentrations within the TCE plume and to demonstrate plume stability.

2.0 SITE BACKGROUND

2.1 Site History

The Subject Site operated as a rail yard and was part of the Terre Haute & Indianapolis Railroad – Vandalia Line from at least 1885 – 1930s. Former railroad operations associated with the Subject Site included rail sidings and maintenance facilities (roundhouse). The Subject Site also operated as the National Steel Construction Company – Logansport Plant, manufacturers of steel products from at least 1949 to the late 1950's. General Tire reportedly operated the plant until it was purchased by Exide in 1959. Exide operated the Subject Site as a lead-acid storage battery manufacturing facility for the automotive industry from about 1960 into the 1990's, and at a limited capacity before fully shutting down in 2009. Documentation reviewed in the IDEM VFC indicate the Exide facility was serviced by truck and railcar. At least four (4) loading docks have been identified by either historical aerial photos or VFC documents, and the remnants of the rail siding to the plant remain on-site, with the rails and ties having been removed during the demolition of the factory buildings in 2016. The Subject Site has since been vacant.

According to the Remedial Action Proposal (RAP) for Exide Corporation's Logansport, Indiana Facility (Kirkland & Ellis, 1984; IDEM VFC # 47594180), primary operations included the manufacturing of "Lead acid storage batteries, used primarily in automobiles, are constructed from cast lead grids to which has been added a leady paste. These grids are assembled into a multi-cell case, interconnected, and then covered and sealed. Sulfuric acid is added, and the batteries are given an initial or formation charge." The report states that in addition to the manufacturing operations, storage and inventory functions have taken place at various locations both inside and outside the Exide plant since operations began in 1960, and the report indicates that machinery had been controlled as required since at least the early 1970's with baghouses, scrubbers, and other control equipment designed to minimize lead and other emissions inside and outside the plant. The report also states that there were used baghouses stored on-site from other plants and facilities.

The Kirkland & Ellis proposal states that lead and other raw materials were shipped into the plant by truck or railroad car on a daily basis during operational periods. They indicate that lead arrived in the form of bars or pigs that were stored in inventory then processed at the plant into lead parts and lead oxide powder. They note that the lead oxide powder was collected in drums for later use in the plant. Their records state that prior to 1983, lead oxide was also produced at Logansport and shipped to other Exide plants, and that inventory drums of lead oxide as well as other inventory may have been stored outside the building at various times in the past. The 1984 RAP also stated that Exide recycled virtually all of its lead-related by-products off-site and that the site property had occasionally been “used for the storage of used equipment intended for reuse, such as used baghouses, or for other activities that may have resulted in the inadvertent deposition of small quantities of lead.” Maps provided in the RAP included an unlabeled plant layout as of 1983, proposed remedial sections and areas, as well as sample points used to determine the extents of the impacted areas circa 1983.

According to the RAP, a minimum of 1750 cubic yards of soil were proposed to be removed. The proposed remedial action stated that only material and shallow soils, no more than 6” in depth and containing more than 2000 ppm lead, were to be excavated. Upon completion, the plan stated an estimated 2100 tons of impacted soil was removed from the Subject Site.

2.2 Geologic Information

2.2.1 Surficial and Unconsolidated Geology

The Logansport area in which the Subject Site is located approximately on the border between the two physiographic provinces known as the Tipton Till Plain and the Steuben Lacustrine Plain of the Northern Moraine and Lake Region (Fenelon, et al, 1994). The landforms encountered in the Logansport area are glacially or post-glacially derived. The relief around the area tends to reflect the Steuben Lacustrine Plain in the form of till knobs or kame knobs, as much of the Steuben Lacustrine Plain province consists of kame complexes. The kames are comprised of ice-contact sand and gravel deposits (Fenelon, et al, 1994).

The unconsolidated deposits of the Logansport area are predominantly outwash deposits (Gray, 1989). These Wisconsinan age glacial outwash deposits are comprised of sand and gravel deposits of the Atherton Formation (Gray, 1989). Up to eighty feet of unconsolidated sediments overlie the bedrock in the area. However, refusal, likely bedrock, has been encountered at depths ranging from 11.5 to more than 20 feet at the Subject Site. Conceptual geological cross sections are presented in Figures 3a – 3c.

The soil under the Subject Site is mapped as belonging a single soil type: the Gilford loam, gravelly substratum (Gg) with 0 to 2 percent slopes, covering 100% of the site. The Gilford series soils consist of deep, poorly drained, gently sloping soils situated in depressions on outwash plains, formed from loamy outwash over sandy and gravely outwash (Web Soil Survey – Appendix B).

2.2.2 Bedrock Geology

The bedrock geology of the area is recognized as part of the Wabash Formation (Gray, et al, 1987). The Wabash Formation is comprised of limestone, dolomite, and argillaceous dolomite, which is Silurian in age. The bedrock physiographic province is known as the Bluffton Plain (Fenelon, et al, 1994).

Argillaceous limestone of the Wabash formation is present throughout the Logansport area. Depth to refusal (likely bedrock) ranges from 11.5 feet BGS in SB-21 the eastern edge of the Subject Site to more than 20 feet BGS at SB-9. Depth to bedrock has not been determined at the west end of the Subject Site. Borings SB-11 / MW-2, SB-17 - SB-20 / MW-1 were terminated at 15 feet due to encountering a clayey layer between 12 and 15' BGS. There is a known presence of large cobble fields in the area in and around Logansport. Encountering these cobbles will mimic the resistance of bedrock when encountered by a direct-push drill rig. Smaller cobbles will block the opening of the probe rod cutting shoe, preventing soils from entering the soil core liner, resulting in little to no sample recovery in that depth interval. Therefore, refusal at shallower depths could be the result of cobbles or a cobble layer.

A generalized cross section model is presented in Figures 3a – 3c and is based on geologic information ascertained from boring locations that encountered bedrock. The bedrock appears to gently slope from east-northeast to the west-southwest.

2.2.3 Hydrogeology

The Subject Site is located within the hydrogeologic province of the Upper Wabash River Basin, which is considered to be the largest water management basin in Indiana (Fenelon, et al, 1994). The main tributary of the area is the Upper Wabash River. There are minor tributaries associated with the basin, more specifically, as located in Logansport, is the Eel River. Three aquifers have been identified in the area around Logansport: a surficial sand and gravel aquifer; a buried sand and gravel aquifer; and a carbonate bedrock aquifer (Fenelon, et al, 1994). The City of Logansport is served by a public water supply. Static water level in the area is approximately 21 feet to 24 feet BGS (Fenelon, et al, 1994). Water levels collected from the temporary monitoring well network during the previous investigation indicate static water levels between 5.80 and 7.45 feet BGS throughout the Site. Groundwater flow at the Subject Site is estimated to be to the southwest (Figure 4) toward the Wabash River.

Surface contours and the locations of the rivers suggest that the larger area groundwater flow direction is probably to the south toward the Wabash River (0.6 mile away). However, the nearest river is the Eel River located 0.35 mile to the southeast.

Based on measurements derived from the monitoring well borings and groundwater elevation data, the thickness of the unconsolidated aquifer ranges from approximately 2.8 feet to more than 15 feet. The aquifer appears to be thickest at the center of the monitoring well network, and thins out to the eastern, western, and northern edges of the area. The groundwater flow pattern could potentially be influenced by the shape of the aquifer and the underlying bedrock within the area.

2.3 Preliminary Evaluation of Potentially Susceptible Areas

2.3.1 Geologic

The Upper Wabash River Basin Aquifer System is geologically susceptible to impacts resulting from releases of hazardous substances. Susceptible areas include the buried sand and gravel aquifer as well as the carbonate bedrock aquifer.

2.3.2 Wellhead Protection Areas

The Subject Site is not located within an identified WHPA.

BCA searched the Indiana Department of Natural Resources (IDNR) online water well database for wells located near the Subject Site and tabulated and mapped the results as shown in Appendix C. The survey and potential receptors study included searching the IDNR electronic Well Record Database for low capacity wells (less than 70 GPM) within a 1-mile radius and high capacity wells (greater than 70 GPM) within a 2-mile radius of the Subject Site. The potable well survey has identified 4 wells records within a 1-mile radius that are in the general downgradient direction of the Subject Site:

- Record number 96597, Dicko Bait Shop, US24W.
- Record number 104355, KLK Manufacturing, 1121 Magnolia St.
- Record number 104410, Alpha Industries, 615 Center Avenue.
- Record number 104385, USGS, Logansport Sewage Pumping Station.

Although the DNR plotting of these wells indicates they are in the general down-gradient direction, the actual location of 104355 is on Magnolia Street, 1100 feet east, which is cross-gradient of the Subject Site. Wells 96597 and 104410 are located 2,200 to 2,800 feet west-southwest. Based on the groundwater flow direction determined from the monitoring wells on the Subject Site, these wells are also cross-gradient of the Subject Site.

Well 104385 is an USGS observation well located on the north shore of the Eel River, 3,400 feet south-southeast of the Subject Site. The well is located on the City of

Logansport's sewage pumping station property, situated on Front Street.

A well record (104360) was found for The Electric Storage Battery (parent company of Exide Corporation) facility at 301 Water Street. The well was completed on April 15, 1960. The precise location of the well is unknown. However, a structure is present on-site that may be a well vault. The structure is situated south of the former building and upon opening the steel access cover, standing water was present preventing the observation of any interior features.

Observations made from City ROW of nearby properties identified a well 1,200 feet to the southwest of the Subject Site, on an industrial property (Matthew Warren Inc., 810 Bates Street). No well record has been found for the site.

The risk of human exposure from impacted groundwater to any of the known downgradient wells is very low because the TCE plume does not appear to be currently migrating off the Subject Site. Other groundwater wells located to the east, north, and west of the Subject Site, and south of the Wabash and Eel Rivers, will have no potential for impact by any release from the Subject Site.

2.3.3 Social

The Subject Site is located within an area used for residential and commercial purposes and may include socially sensitive areas such as the adjacent residences.

2.3.4 Ecological

The closest surface water is the Eel River, located 1,760 feet to the southeast of the Subject Site. The Wabash River is located 3,500 feet south of the Subject Site. No other potential ecologically sensitive areas (Eco SAs) were identified within the area of the Subject Site. Eco SAs can include karst terrain; surface waters, including wetlands and riparian areas; parks, preserves, and other protected areas; and habitats used by endangered or threatened species, or species of special concern.

2.4 Contaminants of Concern

The contaminants of concern (CoC) identified during the sub-surface investigations includes lead on most of the site and VOCs (TCE) at the east end of the site. The following specific VOCs were detected above the PLs in the groundwater and soil gas at the Subject Site:

- TCE

The following specific constituents were detected above the EDC PLs in the soil on the Subject Site:

- Lead
- TCE

2.5 Preliminary Evaluation of Contaminant Transport Mechanisms

Results of the subsurface investigations indicate that the primary contaminant transport mechanisms include:

- Downward migration of TCE from source area soil to groundwater beneath the Subject Site.
- Southerly advective groundwater flow and dispersion through the lower reach of the unconsolidated aquifer.
- Vaporization and upward vertical transport of TCE from the water table to the Subject Site shallow soils.
- Wind transport of fine dust containing lead can potentially be dispersed to nearby areas.

2.6 Preliminary Evaluation of Potential Human Exposure Pathways

Identified preferential pathways include potential vapor migration via utility conduits such as sewer lines. Figure 2 shows locations of known buried utilities at and near the Subject Site. Wastewater from the former building discharged into the sanitary sewer under Water Street. The sanitary lines exited the building on the north side of the building. The sewer line runs east-west under Water Street. Logansport Municipal Utilities as-built maps indicate a 24” sanitary line runs north-south along the east property line, connecting Water Street to the north to Plum Street to the south across the rail corridor. The 18” sanitary from the former Trelleborg site, adjacent to the south, also connects to this line. Soil and groundwater samples collected in the vicinity and adjacent to the sanitary line on the Subject Site show no indication of leaking or release from the sanitary sewer.

The LMU as-built maps show a buried 6” water main enters the Subject Site from the southeast corner from Vine Street to the southeast. The depth of the main is unknown but is likely 3 – 4’ below grade. The main entered the former factory near the east loading docks. Borings HS-1, SB-7, SB-25, SB-27, and monitoring well MW-5 are located near and along the water main. Analytical results (HS-1, SB-7/MW-5) indicate the water main could potentially provide a preferential pathway.

Gas lines run to the north side of the former building from Water Street to the north. No borings were placed near the gas line as the location of the line is away from identified areas of concern.

Environmental conditions at the Subject Site, current land use, and anticipated future land use and identified lead in the surface and shallow sub-surface soils, and TCE concentrations in the soil and groundwater suggest that the following human exposure routes are relevant for the indicated media and potentially exposed populations:

a) Lead is present on the surface and in the shallow sub-surface soils in the area south, east, and northeast of the former factory building. The areas appear to be localized but are not fully delineated, and samples exceed the R2 EDC PL for lead. This pathway is incomplete as direct exposure to lead impacted soils since the site is not occupied, is fenced off and current conditions are not generating dust. However, a small area is outside the fence along the street which may result in a completed exposure pathway. The pathway will be controlled in the future through substantive removal of the lead impacted soils, a health and safety plan for the workers, and ICs if there is residual.
b) TCE is present exceeding the R2 EDC PL in the sub-surface soils in the area east of the former factory building and in the groundwater in that area. These pathways are incomplete as direct exposure to impacted soils as the site is not occupied and the groundwater is not used. The pathway will be controlled through partial removal of the TCE impacted soils, a health and safety plan for the workers, and ICs if there is residual.
c) Groundwater on-site and within 100 feet of existing adjoining structures exceeds the former RCG RG PL for TCE. There is potential for VI from groundwater to indoor air of structures adjoining the Site and planned structures on the Site. The investigation of the off-site pathway suggests that offsite transport is not occurring. The on-site pathway will be controlled by removal of the source area soils, ISCO application and treatment of residuals, and ICs requiring a passive system and post-construction VI sampling with an active VMS installed if the IA RAO's are not met.
d) Ingestion of groundwater (with TCE) off-site. This pathway is incomplete since the plume is limited to the Subject Site. There are no drinking water wells nearby and future use of groundwater is also restricted by City Ordinance.
e) Ingestion of groundwater beneath the Subject Site. As indicated above, this pathway is considered incomplete and otherwise controlled through ICs.
f) Migration of lead or TCE from on-site soils to groundwater, thence to ingestion on-site or downgradient. As indicated above, this pathway is considered incomplete and otherwise controlled through ICs.

g) Transport of contaminated groundwater and ingestion of groundwater from downgradient off-site areas. As indicated above, this pathway is considered incomplete and otherwise controlled through ICs.

EXPOSURE PATHWAY EVALUATION

Pathway	On/Off-site	Is Pathway Complete?	If Incomplete, how presently known or controlled?	How controlled in Future	R2 PL
Lead					
Soil Direct	On-site	No	No site occupants and fenced.	Remediation	EDC PL
Soil Direct	On-site	Yes	Small area outside fence.	Remediation	EDC PL
Soil Direct	Off-site	No	Delineation (<PL)	NA	NA
GW Ingestion	On-site	No	Delineation (<PL)	NA	NA
GW Ingestion	Off-site	No	Delineation (<PL)	NA	NA
Chlorinated Solvent Area(s)					
Soil Direct	On-site	No	Below surface and no site occupants	Remediation	EDC PL
Soil Direct	Off-site	No	Delineation (<PL)	NA	NA
GW Ingestion	On-site	No	No GW use	IC #1, IC #2	> PL
GW Ingestion	Off-site	No	Delineation (<PL)	NA	NA
GW to VI	On-site non-resid	No	No structures	Monitoring & IC #3	SG PL
GW to VI	Off-site	No	SGe & SWG delineation	NA	NA PL
IA	On-site non-resid	No	No structures	IC #3	NA
IA	Off-site	No	SGe & SWG delineation	NA	NA

Notes: Delineation = delineation has shown CAHs less than SL
NA = not applicable due to control or delineation
IC #1 = Current Institutional Control governing local groundwater for potable use
IC #2 = Institutional Control prohibiting potable use of groundwater on the Subject Site
IC #3 = Institutional Control requiring vapor mitigation system for occupied on-site structures.
IC #4 = Institutional Control requiring vapor mitigation system for occupied off-site structures.
PL = monitor for GW >RG PL w/in 100' of occupied structure

2.7 Identification of Historical Data Gaps

The vertical and lateral extents of the TCE hotspot around HS-5 20W are not fully delineated.

3.0 METHODS OF INVESTIGATION

3.1 Sampling and Analysis Plan

No other investigations are planned at this time. However, additional delineation of the HS-5 20W TCE hotspot may be warranted in combination with installation of a monitoring network.

3.2 Analytical Work

Soil metals (lead) samples were/will be analyzed by EPA Method 6010B. All soil and groundwater VOC/CAH samples were/will be analyzed by EPA Method 8260. All soil gas samples will be analyzed by EPA Method 8260C for passive samplers or TO-15 for Summa Canisters. Prior investigations included the full range of VOCs. Previous analytical laboratory reports included Full QA/QC data packages. Summaries of the results of analytical work are included in Tables 1-7. Future VOC analyses will be limited to CAHs that have been detected above/near the HHLs at some point: TCE, c-DCE, VC, 1,1-DCE, 1,1-DCA.

3.3 Field QA/QC Samples

Field QA/QC samples for past investigations included field duplicates, MS/MSD, equipment blanks and trip blanks. Specific information on the QA/QC samples with each data set is included with the corresponding investigation reports. Summaries of the results of equipment blanks and field duplicates are included in Tables 1 - 7. Any additional investigations will meet the IDEM R2 minimum data deliverable requirements.

4.0 INVESTIGATION RESULTS

Soil, groundwater, and soil gas sampling collected throughout the series of Site Investigations from 2020 through 2023 and included 150 soil borings, 54 surface soil/material samples, five (5) permanent monitoring wells, 22 temporary monitory wells, and 29 SGe / conduit vapor samples. The boring logs are included in Appendix D, GPS coordinate data tables for soil boring, monitoring well, and SGe sample locations are included in Appendix E, Low Flow Sampling Logs are included in Appendix F, and figures, tables and XRF data from previous investigation reports are included in Appendix G.

4.1 Subsurface Geology Investigation Results

4.1.1 Soil Lead

Out of a total of 420 soil samples analyzed, Lead was detected in 124 samples above the EDC HHL (1000 mg/kg), from soil probes and surface samples, and more than half of those were greater than 2x the EDC PL. The average lead concentration for all samples exceeded 1.5x the EDC PL, with the highest concentrations found in the surface soils in the northeast portion of the Subject Site and in areas underneath the southwest portion of the building slab. Samples collected from the south side of the former building footprint routinely exceed the EDC PL. Figure 5 shows the soil sample locations exceeding the IDC PL.

4.1.2 Lead TCLP

Thirty-four samples with total lead concentrations ranging from 804 mg/kg up to 46,900 mg/kg were analyzed for leachable lead by a TCLP test. Every sample below 1,380 mg/kg (9 samples) passed the TCLP test (<5 ug/L) while almost every sample which were greater than or equal to 1,800 mg/kg (23 of 24 samples) failed (>5 ug/L). All six (6) samples which fell between 1,380 and 1,800 mg/kg passed the TLCP test.

4.1.3 Lead Treatability Study

A lead treatability study was performed in early 2024 to determine the effect of certain amendments on the lead impacted soils of the Subject Site. Four different amendments were tested; 1) Blastox®, 2) Terrabond®, 3) Blast furnace slag with MagOx, and 4) Phosphate with MagOx. Dosage rates varied from 3% to 5% (by weight) for each amendment. The results of the treatability study indicated that a 5% Terrabond® application would be effective at reducing leachable lead to below the 5 ug/L TLCP threshold for characteristic hazardous waste. (Appendix L)

4.1.4 Soil TCE

During the initial Phase II, TCE was detected in the groundwater on the eastern side of the property at levels exceeding regulatory screening levels, however no indication of contaminated soil was found. During a follow-up investigation, a soil gas survey was conducted (discussed in Section 4.3) in an attempt to locate hotspots where the soil might be impacted. Based on soil gas results, soil samples were collected and analyzed from five (5) additional locations (HS-1 through HS-5) (plus step-out probes) on the eastern side of the property, and regulatory exceedances for TCE were found in two (2) of those locations. Soil VOC samples were collected from locations as shown in Figure 6.

HS-1 hotspot – this sample was co-located with A-5 of the soil gas survey, and soil sampling at this location has been sufficient to fully define the extents of TCE contamination. During the final phase of investigations, 10- and 20-foot step-outs were collected from around HS-1 and it was found that the areas to the south and east contain only trace or low levels of TCE. Concentrations in HS-1 itself were found to slightly exceed the EDC SL (200 mg/kg), while concentrations in the 10-foot west step out were as high as 746 mg/kg. This sampling indicates that the actual hotspot is likely located somewhere between HS-1 and HS-1 10'W. However, based on the presence of a gravel filled loading dock, subsurface samples were not collected to the north of HS-1, and it is possible that soil contamination is present underneath the concrete base of the loading dock.

HS-5 hotspot – this sample was co-located with SGss-1(2) of the soil gas survey, and soil delineation at this location remains incomplete. Soil samples collected from HS-5 had elevated concentrations of TCE present, however they were still below screening levels, while samples from the northern and eastern step-outs contained only trace or low-level detections. One sample from the 20-foot west step-out (HS-5 20'W (3')) contained TCE at 1,040 mg/kg, however TCE concentrations in the samples below 3' dropped off rapidly. TCE concentrations in the groundwater at HS-5 were almost an order of magnitude greater than those found elsewhere on the site.

Based on the probes the soils on the site are silty and sandy clays grading to sand and gravel generally starting around 2.0 – 5.0 feet BGS. Refusal, likely bedrock, was encountered at about 11 – 13.0 feet BGS in most locations (SB-GW-25, SB-GW-23, SB-GW-21, SB-GW-22, SB-GW-24, MW-4, and MW-5) and around 14 - 20 feet BGS at all other probe locations (SB-GW-26, MW-1 through MW-3). However, large cobbles are known to be present in the subsurface throughout the Logansport area. Other investigations in the area have reported large cobbles being encountered below 8 feet. Shallow refusal encountered in some on-site borings could be due to cobbles.

4.2 Hydrogeology Investigation Results

Groundwater samples have been collected from five (5) permanently installed monitoring wells, as well as 22 temporary monitoring wells installed on the Subject Site. During the initial Phase II investigation groundwater samples were analyzed for VOC, PAH, and metals. After the installation and initial sampling of five permanent monitoring wells, subsequent groundwater samples were analyzed for VOCs only.

4.2.1 Groundwater TCE

During the initial Phase II, TCE was detected in the groundwater at SP-GW-6 and SP-GW-7 exceeding regulatory screening levels suggesting a TCE groundwater plume might be present on the eastern side of the Subject Site, however further groundwater sampling from temporary monitoring wells to the east and south have shown that this plume does not extend offsite. To date, the highest TCE concentration was present from a temporary monitoring well located at HS-5 (468 ug/L).

4.2.2 Groundwater Lead

Lead, along with several other metals analytes, were detected exceeding regulatory screening levels in both filtered and unfiltered samples during the initial Phase II investigation. After the installation and development of five permanently installed monitoring wells, the wells were sampled and field filtered samples were found to be below laboratory detection limits for lead and arsenic. This indicates that the exceedances noted in the initial Phase II were due to sediment carryover in the groundwater samples.

4.2.3 Natural Attenuation

At sampling locations where parent CAH compounds (TCE and 1,1,1-TCA) were found, daughter products (c-DCE, VC, 1,1-DCA and 1,1-DCE) were also detected, although at low to trace concentrations. The presence of daughter products indicates biological reductive dechlorination could be occurring and suggests that natural attenuation could be an effective remediation method.

4.2.4 Permeability Testing

No permeability study has been conducted on any of the wells within the monitoring well network. However, almost all of the monitoring wells have enough permeability to sustain low-flow sampling, indicating moderate to low permeability. Based on flow rates and draw-down data collected during low-flow sampling throughout the monitoring well network, horizontal permeability (k_h) is estimated to range from 10^{-4} to 10^{-5} cm/sec in the unconsolidated aquifer system.

4.2.5 Monitoring Well Installation

Monitoring well construction diagrams are provided in Appendix D. Groundwater analytical laboratory results and QA/QC analysis are summarized in Tables 4-5 and are shown on Figure 7. The following chart summarizes well installation history:

Well Number	Date Installed	Depth	Notes
MW-1	3/31/2022	16.18'	GeoProbe Direct Push Rig
MW-2	3/31/2022	14.30'	GeoProbe Direct Push Rig
MW-3	3/31/2022	14.95'	GeoProbe Direct Push Rig
MW-4	3/31/2022	13.00'	GeoProbe Direct Push Rig
MW-5	3/31/2022	11.80'	GeoProbe Direct Push Rig

4.3 Vapor Investigation Results

Based on the detections of chlorinated compounds in the soil and groundwater on the eastern side of the Subject Site, a shallow soil gas and conduit vapor survey was conducted during a supplemental Phase II to identify locations of higher soil gas concentrations that would be indicative of a potential source area(s) and to evaluate the potential for vapor migration and vapor intrusion (VI) to future on-site structures and adjoining properties. Follow up sub-slab soil gas and vapor conduit samples were collected in 2023 to determine if the 2022 soil gas detections were all resulting from a single source or to determine if a secondary source was present onsite. Conduit vapor samples from the sanitary sewer along the eastern property line adjacent to the neighboring commercial building were also collected.

4.3.1 Exterior Soil Gas Survey

During the 2022 Supplemental Phase II, a total of 26 shallow exterior soil gas (SGe), sub-slab soil gas (SGss) and conduit (sewer) vapor (CV) samples were collected from the area around boring SB-6 where TCE was detected above the RCG I-VIGWSL in the initial Phase II.

The soil gas points were laid out on a grid pattern with 30-foot spacing with additional locations added along the eastern property line. The grid covered a 120 ft x 90 ft area with 20 sample points as shown on Figure 8. A gravel-filled loading dock was discovered during the layout of the grid, resulting in two sample point locations, A-4 and B-4 being omitted and relocated to the south end of the grid and designated C-6 and D-6. Three (3) SGe points were located along the eastern fence-line to assess the potential for vapor migration to the adjoining buildings. Two (2) sample points were installed as SGss points through the slab of the former building, and one sample point (CV-1) was deployed in an on-site sewer manhole to determine if vapors might propagate through the on-site sewer and storm drain conduits.

The samples were collected by passive sampling methods. The sample apparatus, provided by Beacon Environmental, consisted of a small passive sampler (Beacon PSG Sampler) placed in a 3 ft deep x1 inch hole for soil gas, or suspended by wire in sewer manholes to within 1 foot of the high-water mark of the manhole for the CV sample. The sampler deployment, retrieval, and handling procedures followed the guidelines and instructions as indicated in Beacon's Passive Soil Gas Testing – Standard for Site Characterization Rev5 (Appendix H). After collection, the samples were shipped to the Beacon Environmental laboratory for analysis following EPA Method 8260C. The survey report included color isopleth maps indicating areas of highest soil gas concentrations of target compounds (Appendix I).

Analysis of the SGe samples were limited to a target compound list consisting of tetrachloroethene (PCE), TCE, 1,1,1-trichloroethane (TCA), cis-1,2-dichloroethene (c-DCE) and vinyl chloride (VC). Analytical laboratory results are summarized in Tables 6-7 and are shown on Figure 8. TCE exceeded the R2 Large Industrial SGe HHL in samples A-5 and SGss-1, exceeded the R2 Industrial SGe HHL in B-5, and was found in three locations (A-3, B-3, C-3) exceeding the RCG Residential Exterior Soil Gas SLs.

Based on the significant TCE detections in SGss-1 and A-5 (approximately 75 feet apart), follow up samples were collected in 2023 to determine if these two detections were resultant from the same source or if an additional TCE source was present. During this Additional Delineation Sampling, six (6) additional sub-slab soil gas samples were collected at 20 foot stepouts around SGss-1, and to the south between SGss-1 and A-5.

Results from this round of samples showed a significantly higher detection in the northern step-out of SGss-1 (SGss-1(2) @ 257,000 ug/m3), and an elevated detection in the eastern step-out (SGss-3 @ 1,030 ug/m3). Samples SGss-4 and SGss-5, located between the SGss-1 and A-5 hotspots were both well below regulatory screening levels, suggesting that two separate hotspots were likely present. Sample SGss-6, located approximately 20 feet west of the A-5 hotspot and 20 feet south of SGss-5, also exceeded the large commercial / industrial SL. Based on these detections, additional soil samples were collected from the vicinity of SGss-1(2) (see Section 4.1).

4.3.2 Vapor Conduit Survey

Additional Delineation Sampling also included two (2) vapor conduit samples collected from manholes located along the sanitary line just off the eastern edge of the property. The results of both these samples were below screening levels, suggesting that offsite vapor migration through the sanitary sewer is not occurring.

4.4 Data Quality Assessment

4.4.1 Sample Delivery and Analytical Work

During Site investigation activities, all soil and groundwater samples were placed on ice and hand-delivered to the analytical laboratory within 24 to 72 hours. Pursuant to EPA Method 5035A (terra core samplers), soil samples for VOCs were stored on ice and frozen within 48 hours of collection.

EPA Method 5035A/8260 (VOCs), EPA Method 8270SIM (PAHs), EPA Methods 6010B, 7470, 7471 (metals), EPA Method 8151 (herbicides), and EPA Method 8260C (VOCs soil gas) were the primary analysis conducted for the on-site investigations supporting this RWP.

4.4.2 Field QA/QC Results

Full QA/QC reports are included with, and the results of QA/QC samples are discussed in detail in each of the investigation reports. The results of the field duplicates and field equipment blanks are included in the appropriate data summary tables. The groundwater sampling results generally showed high precision based on low field duplicate RPD. Low matrix interference was indicated by acceptable MS/MSD recoveries and low carry-over interference from field equipment blanks (usually no detections).

4.5 Data Quality Objectives

The DQOs include acceptable precision (based on field duplicate RPD), acceptable matrix interference based on acceptable MS/MSD recoveries, low blank interference based on field equipment and trip blanks and good sensitivity based on analytical reporting limits at or below the RCG SLs. DQOs were generally met on investigation data sets.

5.0 SITE INVESTIGATION CONCLUSIONS

5.1 Summary of Conclusions

5.1.1 Lead

Soil samples from 51 sampled locations exceed 2x the R2 EDC HHL for lead. Figure 9 shows the estimated extents of lead in shallow soils in excess of the EDC HHL (1000 mg/kg). In general, where present, lead is usually in narrow intervals, often the 0-12" layer.

Filtered groundwater samples exceed the R2 RGW HHL for lead in four of the temporary sample locations. However, samples from the permanent monitoring wells were below detection limits for lead.

5.1.2 VOCs (TCE)

Soil samples from boring location HS-1, HS-1 10'W, and HS-5 20'W indicate TCE impacts above the R2 EDC HHL. Estimated extents of two (2) soil TCE hotspots are presented in Figure 10.

Groundwater samples SB-6, HS-1 10'E, HS-1 10'W, MW-5, and HS-5 exceeded the former RCG I-VIGWSL for TCE. The estimated limits of TCE concentrations in the groundwater is presented in Figure 11. Plume limits are based on groundwater samples collected from temporary sample points as well as the permanent monitoring well.

SGe and SGss samples have indicated the presence of TCE vapors above IDEM VI/SGe commercial/industrial PLs near the two hotspots discussed above.

5.2 Summary of Potential Risks Associated with the Site

Completed pathways include:

- None

Potential future risks include:

- Soil Direct Contact for construction workers from lead and TCE.
- Soil Direct Contact for site occupants from lead and/or TCE-impacted shallow soils at the east end and along the south sides of the former factory.
- TCE vapor migration into future occupied structures on the Subject Site.
- Future ingestion of groundwater on the Subject Site (there is no current use of the groundwater, and the City Ordinance restricts use of the groundwater).

6.0 REMEDIATION PLAN

6.1 Extent of Remediation

Subsurface soil and groundwater at the east end of the former building has been impacted by TCE above the former IDEM RCG SLs and current R2 PLs. SGe and SGss samples indicate continuous off-gassing of TCE and other CAHs from the soil and groundwater beneath the former building in excess of the SGe I-PL. Remediation of the TCE area is planned through a combination of excavation and removal of the TCE impacted soils (source area), application of in-situ chemical reduction (ISCR), long-term monitoring, plume trend analysis, IC's and VMS where needed to prevent completion of pathways.

Lead is present on the surface, under the southwest portion of the concrete slab, and in the shallow subsurface soils in the areas east and south of the former building. There is no evidence of significant downward migration of lead to deeper soils or groundwater. To reduce future potential for direct exposure during planned construction and redevelopment, excavation/removal of the most highly lead-impacted soil is planned. To avoid the high costs of hazardous waste disposal, lead impacted soils will be treated in-situ prior to excavation and disposal.

6.2 Relevant Data Gaps

HS-5 hotspot – TCE delineation is incomplete at this location, and the full extent of chlorinated compounds near HS-5 remains unknown. Additional step-out probes around HS-5 20'W may be conducted prior to excavation.

6.3 Evaluation and Selection of Remedial Alternatives

Sufficient data exists to identify and support the selection of relevant remedial actions.

6.3.1 Potentially Applicable Remedial Technologies

Remedial alternatives evaluated herein are reasonably capable of meeting the remediation objectives stated in Section 1.4. Additional supporting measures will include, but not be limited to, reliance on institutional controls to mitigate future exposure to residual lead and CAHs likely to remain after remediation is complete to the extent practicable.

6.3.2 Evaluation of Applicable Remedial Technologies

In developing this RWP, three (3) soil lead and twelve (12) TCE remedial approaches have been considered as follows:

1. Soil Excavation and Disposal
   Soil and fill material that exceeds the PLs on the Subject Site may be removed and replaced with soil that is not impacted. The removed soil could be disposed of at a landfill. Removal of lead and TCE impacted soils would significantly reduce the levels in the soil and groundwater at the Subject Site. Depth and area of excavation(s) may be more clearly defined for TCE to facilitate final design.
2. Soil/Pavement/Stone/Hardscape Cover
   A layer of soil, stone, pavement, or building pad cap/cover may be constructed over impacted soils on the Subject Site to prevent direct contact exposure. A maintenance plan and environmental restrictive covenant would be needed to maintain the cover. If it is necessary to maintain the grade, then soil would have to be removed before placement of the cover.
3. In-situ Soil Treatment
   In-Situ Soil Treatment involves importing an approved amendment material and mixing that material with contaminated soil. For lead contaminated soils, treatment does not physically remove contaminants, rather it locks contaminants in the soil matrix preventing potential to leach as measured through TCLP.
4. Vapor Barrier
   Installation of a vapor barrier (geomembrane) system beneath future structures at and near the source area would significantly reduce the potential of residual CAH vapors from migrating into occupied spaces.
5. Soil Vapor Extraction
   SVE can be an effective means of removing CAHs from the soil and can remove some from the top of the water table. By drawing low-CAH air across the top of high CAH groundwater, SVE induces diffusion of CAHs out of the aquifer. The size of the identified source area and the size of the groundwater impacted area is relatively small. However, infrastructure to support a system is not currently present at the Subject Site.
6. Air Sparging
   Air sparging (AS) includes pumping compressed air into the aquifer below the plume. The air rises through the aquifer in channels, and pore-scale fingering volatilizes CAHs. The sparged air and CAHs passes through the vadose zone and vents to the atmosphere unless it is drawn into SVE wells. In some areas, AS should be combined with SVE to prevent the risk of migration of CAH vapors to residential basements and structures. By introducing oxygen into the subsurface, AS chemically conflicts with attenuation through anaerobic biodegradation.
7. C-Sparging
   A C-Sparging (ozone sparging) (CS) includes pumping ozone rich compressed air into the aquifer below the plume. The primary means of CAH removal is believed to be direct oxidation of the CAH molecule within the bubble to CO_2 and HCl. CS is combined with SVE when utilized near structures to capture the sparged gases

and unreacted ozone and CAHs. By introducing oxygen into the subsurface, CS chemically conflicts with attenuation through anaerobic biodegradation.

8. Pump and Treat

   The affected groundwater could be removed through several high capacity or many lower capacity wells. The groundwater would be treated on the surface and discharged to the sanitary sewer system. Treatment could include air stripping, carbon adsorption, biological treatment or UV/ozonation. Pump-and-treat is not a cost-effective means of remediating low solubility groundwater constituents, such as CAHs, and would not affect the source area soils. While technically feasible, it is cost prohibitive and remediation times are excessive.

9. Chemical Oxidation – H_2O_2

   CAHs may be oxidized to Cl^- and CO_2 by the *in-situ* addition of hydrogen peroxide (H_2O_2 (Fenton's reaction)). Hydrogen peroxide is a strong oxidizer which will oxidize iron II, forming a hydroxyl radical, which directly oxidizes CAHs. The H_2O_2 is injected into the aquifer through wells or temporary injection points. The off gasses must be collected by means of SVE to prevent buildup of oxygen and reaction products. There are many interfering reactions.

10. ISCO

   In-Situ Chemical Oxidation (ISCO) is the addition of oxidants to soil or groundwater to chemically breakdown contaminants. CAHs may be oxidized to Cl^- and CO_2 by the *in-situ* addition of potassium permanganate ($KMnO_4$) or sodium persulfate ($Na_2S_2O_8$). The oxidant may be mixed with unsaturated soil through soil mixing, applied to soil dissolved in water, or injected into the aquifer in aqueous form through a recirculation well, standard well or temporary injection point. Any off gases from the application of ISCO should be vented from enclosed occupied spaces.

9. ISCR

   In-situ Chemical Reduction (ISCR) is the addition of various chemicals to a subsurface environment to create a strongly reducing environment in which CAHs will be converted to ethene, ethane and chloride through chemically induced reductive dechlorination. Sulfidated zero-valent iron (ZVI) is one such product. The iron filings may be placed in a trench or injected in a slurry across the path of the plume creating a barrier such that all affected groundwater must pass through the remediation barrier. The thickness of the trench is determined by the concentration of the contaminant and the groundwater flow velocity. This technology is proven for CAHs and is ideal for locations where the source area is either undefined or inaccessible, but the plume is narrow. The ZVI may also be mixed as an amendment to saturated soil at the base of an excavation.

10. Bioremediation – Injection Points

   Electron donors may be introduced to the aquifer through slow release compounds

(HRC™; Hicks and Koenigsberg, 1998 and Koenigsberg and Farone, 1999). A polylactate ester slowly releases lactic acid into water for a period of 6 to 12 months. The HRC is in slurry form, which can be injected into the aquifer through numerous probe holes (typically at 10-foot or 15-foot spacing). The line of HRC injection points creates a biodegradation zone equivalent to approximately six to twelve months' worth of groundwater migration. The zone would form a remediation barrier in which CAHs would be degraded through anaerobic reductive dechlorination to non-toxic products. The zone would continue to function until electron acceptors (oxygen and nitrate) migrate into the zone from upgradient or diffuse into the groundwater from the vadose zone above. The selection of lactic acid in a slow-release formulation may optimize the hydrogen concentration in the affected zone, thereby minimizing competing methanogenic reactions. Production of VC is a known risk associated with the anaerobic reduction of PCE and TCE. VC production, if encountered, would require injections of ORC or an oxidizer in the down gradient zones of the plume to alleviate production of VC. Bioremediation is often a cost effective and can provide rapid results compared to other remedies. However, pilot tests are necessary, (have not been conducted) and can create minor delays in remedy deployment.

11. <u>Bioremediation - Inoculated Amendment (Bio-Augmentation) Injection Points</u>
    Bioremediation can be augmented with the introduction of mixtures of beneficial microbes with the selected electron donor compounds. The microbe species are selected based on the COCs, existing biota, and aerobic or anaerobic conditions of the Site. Like bioremediation above, inoculated amendments need specific pilot studies to determine the environmental conditions for the microbes to thrive. The pilot studies (have not been conducted and) are frequently conducted in conjunction with testing feasibility of other alternatives.
12. <u>Plume Trend Analysis</u>
    Natural attenuation includes intrinsic bioremediation, hydrolysis, retardation, dispersion and volatilization. A detailed evaluation of feasibility of natural attenuation has not been fully conducted. Plume trend analysis so far indicates insufficient evidence of statistically significant trend, therefore additional monitoring may demonstrate plume stability/contraction.

6.4 Recommended Remedial Alternative(s)

The recommended remediation alternatives include:

Lead - a combination of in-situ soil treatment followed by soil excavation and disposal. Some treated soil below 2-foot depth may be left in place with an ERC to prevent exposure.

TCE – a combination of soil excavation and disposal, the application of ISCR, and plume stability monitoring in conjunction with appropriate IC's and ERC's within the CAH areas.

The extent of excavation for both lead and TCE areas will depend on field screening and confirmation sampling results. Success of the TCE remediation will be confirmed by closure sampling, quarterly monitoring in existing and planned permanent monitoring wells, and significant reduction or absence of TCE in future soil gas samples. Lead remediation will be confirmed by closure samples of the soil.

The future on-site, groundwater consumption exposure pathway is addressed by a current City ordinance and a planned ERC restricting groundwater use. ERCs will be placed on Subject Site restricting access to the groundwater and requiring passive vapor mitigation systems be installed during construction of any structures, followed by monitoring and (where needed) active VMS systems. Additional ICs may be considered as necessary. Post-remediation groundwater monitoring will be implemented to confirm the plume stability and limits. Post-remediation soil gas sampling will be conducted to confirm the status of potential on-site vapor intrusion. The ERC will also require a soil management plan for deeper soils (below 2 feet) containing lead above the R2 IDC PL.

6.4.1 Area of Contamination (AOC)

The EPA's area of contamination (AOC) policy allows certain discrete areas of generally dispersed contamination to be considered a RCRA unit, where consolidation and in situ treatment of hazardous waste within the AOC do not create a new point of hazardous waste generation for the purposes of RCRA. An AOC will be established on the Site which includes all areas where lead impacted soils will treated in situ. After the in situ soil treatment is complete, the treated soils will be consolidated into stockpiles within the AOC and will be analyzed as required to meet landfill disposal requirements.

6.4.2 Treatment and Excavation of Lead Impacted Soils

TCLP analysis of the Subject Site's soils suggests that lead levels exceeding 1,760 mg/kg would likely fail TCLP (and a very low risk at 1,380 mg/kg could fail), which would require disposal at a hazardous waste landfill. Direct excavation of lead impacted soils would generate thousands of tons of hazardous wastes, equating to several millions of dollars for disposal only. Soil treatment does not physically remove contaminants, rather it locks contaminants in the soil matrix preventing potential to leach as measured through TCLP. Soil treatment would allow any lead contaminated soil which is excavated to be disposed of as non-hazardous wastes rather than hazardous wastes at significant cost savings. After soil treatment, the purpose of the excavation is to remove as much of the highest lead-impacted soils as necessary to reduce the average soil concentration in affected area to below the IDC PL (800 mg/kg). The lead concentrations in the shallow soil northeast of the building are much higher so all of the more impacted soil there will be removed. Initially, shallow soil will be removed from the area extending from the street to south of SB-6 to a depth of 12-inches. Based on field screening and confirmation sampling, the excavation may be extended vertically or horizontally. In addition, shallow soil in the grassy areas to the south of the building footprint will be removed to 0.5 to 2.0 feet, depending upon location. The hotspot removals will be extended horizontally and vertically based on field screening and laboratory confirmation samples. The excavations will be extended until the average of all shallow soil samples in the area is below the IDC PL (800 mg/kg) and all identified soil greater than 2x EDC HHL (2,000 mg/kg) has been removed.

Based on the results of a treatability study, once treated with the in-situ soil amendment, soils should not fail a TCLP test and will be acceptable for disposal at a Subtitle D (non-hazardous waste) landfill. Treated soils will then be concentrated into stockpiles (within the AOC) adjacent to the concrete slab and sampled for lead by TCLP at a rate required by the Subtitle-D landfill. After confirmation that the stockpiles do not exceed the threshold for characteristic hazardous waste (5.0 mg/L lead), the stockpiles will be live loaded into trucks and transported to the nearby subtitle-D landfill for non-hazardous disposal. Any sample / volume which fails the TCLP test will be either retreated in place within the AOC and resampled or transferred as hazardous waste to an appropriate hazardous waste landfill.

Upon completion the excavation will be backfilled and compacted with granular fill from a commercial source. Monitoring well MW-5 may be removed during the excavation and replaced upon completion to monitor the TCE plume (see below).

6.4.3 Excavation of TCE Impacted Soils

The purpose of the excavation is to remove as much of the more highly TCE-impacted soils as practical including all over the IDC HHL (200 mg/kg). Bulk removal of the source will help ensure that the remaining groundwater impact will attenuate naturally. Initially, a 10-foot square area around the TCE hotspot at HS-1 / HS-1 10’(W) will excavated to a depth of 8’ and the soil will be placed in plastic lined roll-off boxes. Soil in the roll-off boxes will be tested for total TCE and soil <10 mg/kg TCE will be transported to a subtitle D non-hazardous waste landfill following issuance of a Contained-In determination from IDEM. Soil 10-100 mg/kg will be tested for TCLP TCE and, if <0.5 mg/L, will also be disposed at a Subtitle D landfill. Soil that is >0.5 mg/L TCE TCLP or >95 mg/kg total TCE will be transported and disposed at a hazardous waste landfill. Based on field screening and closure sampling results (see below) the excavation may be extended by 5’ increments to remove any soil exceeding the TCE IDC HHL (200 mg/kg).

Upon completion of the excavation, a commercially available chemical reducing agent will be added to the bottom of the excavation at/near the water table and mixed in to help remove residual TCE in saturated soils. At least 15,000 lbs of *ZVI (zero valence iron)* will be needed on the bottom and sides of a 20-foot diameter excavation. After confirmation sampling results are obtained, the excavation will be backfilled and compacted with granular fill from a commercial source.

6.4.4 Institutional Controls

Per the city municipal code (Logansport, Indiana, Code of Ordinances, Chapter 50, Article IV, § 50-93(g) (Appendix A)) the installation of groundwater wells and the extraction of groundwater for potable use is generally prohibited within 300' of an existing City of Logansport water main. A statement will be obtained from the City of Logansport to confirm that the ordinance is intended and will be used to prevent potable wells on and near the Subject Site. The City of Logansport Utilities has confirmed that all of the residential properties in the area are connected to the municipal water system. To its knowledge, there are no private drinking water wells located within the area. Accordingly, the risk of human groundwater consumption is considered eliminated based upon existing local controls both on-site and off-site. In addition, an ERC will be placed on the Subject Site to prohibit the use of groundwater for potable use. The ERC will require the installation and use of vapor mitigation systems for any occupied structures at the east end of the property in the areas affected by soil gas exceeding the R2 PLs. The site ERC will prohibit residential redevelopment without further remediation or sampling. The ERC will require a Soil Management Plan for soil more than 2 feet below grade that exceeds the closure goals. Any remaining risk can be addressed through the use of further ICs, as necessary.

6.4.5 Local, State or Federal Permits

A Board of Public Works approval is required prior to installation of any wells or other cuts in public right-of-way. Approval of private property owners must be obtained if wells or other cuts are performed on other private property.

Landfill disposal approvals will be needed for soil disposal. IDEM approval is required for a Contained-In Determination for TCE-impacted soil disposal as non-hazardous waste.

Due to the size of the area for concrete removal and soil excavation, a Storm Water permit will be required.

No other need for permits is anticipated at this time.

6.4.6 Contingent Remediation Plan

If post remediation sampling and/or final closure samples do not meet the closure goals, additional remediation measures will be evaluated.

6.4.7 Cost Estimate

The estimated cost of the project, including the removal of the concrete slab of the former buildings is summarized below:

Summary Budget	Subtotals	Totals
PRE_REMEDIATION		
Hot Spot delineation & reports		$100,000
REMEDIATION	---	
Lead Soil Treatment / Mixing		$715,000
TCE Soil Treatment Amendment		$44,000
Remediation Contractor		
--Mob / Demob	$35,000	
--Safety / Decon	$25,000	
--Wheel Wash	$40,000	
--Storm water & dust control	$25,000	
--Excavation / Equipment / Labor (10,000 tons @ $60/ton)	$600,000	
--Backfill (10,000 tons @ $30/ton)	$300,000	
--Concrete Breaking / Crushing / Stockpiling	$120,000	
Total Contractor Budget		$1,259,500
Landfill - Lead Contaminated Soil (9,741 tons @ $32/ton)		$342,883
Landfill - TCE Contaminated Soil (356 tons @ $32/ton)		$12,531
Consulting / Engineering (incl Completion Rpt)		$361,970
POST REMEDIATION MONITORING		
GW Well Installation		$65,000
Quarterly Monitoring x 8 w/ reports		$95,000

Total Budget $2,995,884

6.5 Sampling Plan(s) for Remediation

This section addresses monitoring and closure sampling in support of the remediation and includes closure samples during the soil excavation, SGe sampling and groundwater sampling to monitor the status and stability of the TCE plume.

6.5.1 Soil Excavation Closure Samples

When the excavation of lead impacted areas has reached the predetermined limits or based on XRF or PID field screening, confirmation samples will be collected. The confirmation samples will include soil samples only. The bottom and sidewalls of the excavations will be screened (XRF or PID) and soil samples will be collected at a maximum of 20-foot intervals at locations indicated by field screening as representative (generally the highest screened location). The soil samples will be collected from within six inches of the exposed surface. The soil samples for TCE will be collected by EPA Method 5035A, placed on ice and frozen within 48 hours. Soil samples will be analyzed by EPA Method 8260 for TCE and Method 6010B for lead. QA/QC samples will include trip blanks, field blanks, field duplicates, and MS/MSD samples. The laboratory reports will include full (Level IV) QA/QC data package. Results will be compared to the EDC and IDC PLs to determine whether any remaining restriction to exposure is needed.

6.5.2 Post-Remediation Groundwater Sampling and Monitoring

The monitoring well network currently consists of 5 permanent 1" wells at depths ranging from 11 feet to 15 feet BGS. Additional shallow monitoring wells will be installed in and downgradient of the TCE impacted area at or near HS-5, HS-1, SB-6, and SB-26 (and MW-5, if necessary). In addition, deeper (bedrock) wells will be installed at the HS-1 and HS-5 (source area) locations. Groundwater monitoring will be conducted quarterly until clean-up goals are met, plume stability is demonstrated, or site closure is granted from IDEM. Groundwater will be purged and sampled following the IDEM Micro-Purge (Low-Flow) Sampling Option (updated May 11, 2021) to the extent possible and analysis will be for CAHs by EPA method 8260. Water levels will be collected from all wells and groundwater flow maps created. The results of the monitoring along with other remediation progress information will be included in each QMPR.

6.5.3 Post-Remediation Vapor Intrusion Monitoring

Post-remediation soil gas sampling may be conducted in the TCE-impacted soil area. If the results do not confirm that vapor exposure levels are below PLs, then the ERC will require vapor mitigation on future buildings near the affected area. At least one round of IA sampling will be conducted in future structures prior to occupancy to test the effectiveness of the vapor barrier or vapor mitigation systems.

6.6 Schedule for Submittal of Results

A Remediation Implementation Report will be prepared and submitted to IDEM following completion of the treatment, excavation, and backfill activities, installation of monitoring wells, and first round of groundwater sampling. The report will include documentation of soil removal and closure sample results.

6.6.1 Data Management

Soil sample results from the excavation closure will be summarized in a single table for lead and a second for CAHs. Historical soil testing results are summarized in the attached tables.

All groundwater monitoring data will be summarized in tables of current results as well as a larger database of historical groundwater monitoring results. Groundwater monitoring data will also be summarized in figures showing monitoring well locations, and the extent of the groundwater plume and recent monitoring well testing results. QA/QC sample (field duplicates and blanks) results will be summarized in a separate table.

Any IA, SGe, and SGss samples will be summarized in a single table organized by location and including any historical data for comparison. VI sample results will also be summarized on figures showing sampling locations.

6.7 Projected Work Schedule

The projected work schedule for implementation of the tasks described in this RWP is discussed in the following sections.

6.7.1 Implementation Schedule

The following schedule is anticipated for implementation of the remediation:

Months after approval of RWP Rev	Task
2	Excavation Contractor Coordination
2-3	Begin soil treatment (lead)
3-6	Excavation and removal of TCE and lead impacted soils
3-6	Excavation confirmation sampling, concrete break & crush
3-6	Backfill and cover
7	Install permanent monitoring wells
8	Conduct quarterly groundwater monitoring; SGe Closure Sampling (1st round)
9	Remediation Implementation Report
11	Conduct quarterly groundwater monitoring.
13	QMPR
14	Conduct quarterly groundwater monitoring.
16	QMPR

17	Conduct quarterly groundwater monitoring.
19	QMPR
20	Request for Closure and Post-Closure monitoring plan, if applicable.

Up to eight (8) rounds of quarterly groundwater monitoring (Section 6.5.2) will be conducted, if necessary. QMPRs will be submitted after each calendar quarter and will summarize the events in the preceding quarter.

6.7.2 Closure

After closure is obtained, the monitoring wells will be maintained (repaired and replaced as necessary) for the duration of the post-closure monitoring requirement, if applicable. All monitoring wells that are not required for post closure monitoring will be abandoned by a licensed well driller as per Indiana Code (25-39 and 312 IAC 13).

6.8 Health and Safety Plan

See attached Appendix J.

6.9 Quality Assurance Project Plan

See attached Appendix K.

7.0 COMMUNITY RELATIONS

The following Community Relations Plan ("CRP") is included pursuant to the requirements of the Indiana Remediation Program Guide (RPG) and Indiana Code Section 13-25-5-7. Indiana Code Section 13-25-5-7 requires that a Remedial Work Plan include provisions for "community relations and community comment in planning, cleanup objectives, and implementation processes."

Community relations and public comments are the responsibility of the City of Logansport. The primary purpose of a community relations plan is to provide a means of informing the public regarding the project. The main components include public meetings associated with the review and approval of proposals to the City for the redevelopment of the Subject Site. The meetings will be held in conjunction with approval of any new contracts for the redevelopment by the City of Logansport. Remediation plans and progress are also presented at board meetings which are open to the public. A Public Comment period is required prior to approval of the RWP by the IDEM and will be conducted by IDEM. City of Logansport officials and public bodies will be kept apprised of the status of the project by means of internal progress reports.

8.0 QUALIFICATIONS AND LIMITATIONS

BCA Environmental Consultants, LLC prepared this RWP in accordance with the IDEM RCG and Risk-based Closure Guide and generally accepted practices in a manner consistent with that level of care exercised by other members of our profession in the same locality and practicing under similar circumstances. Our professional opinions are based upon available information describing the Subject Site and area and the results we obtained for widely spaced samples of soil and groundwater. Conditions in areas not specifically sampled or analyzed may differ significantly from those inferred in this RWP. Although the scope of the remediation discussed in this RWP is believed to be appropriate to address the stated objectives, we note that no environmental assessment can completely eliminate uncertainty with respect to the presence, concentration, or extent of chemicals of concern in soil or groundwater, and that no RWP is likely to anticipate all relevant environmental conditions that may be encountered as remediation is performed. The timing and cost for implementation and completion may therefore be either more or less than those estimated herein.

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Tables

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	400
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	800
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	1000
RCG Soil Migration to GW Screening Level[2]					mg/kg	270
Former Exide Corporation - 2021 Phase II						
Former Exide 20-224	SB-1 0-1'	50275469021	12/07/2020 09:20	Solid	mg/kg	85.4
Former Exide 20-224	SB-2 0-1'	50275469022	12/07/2020 09:40	Solid	mg/kg	70.4
Former Exide 20-224	SB-3 0-1'	50275469023	12/07/2020 10:20	Solid	mg/kg	1160
Former Exide 20-224	SB-4 3-4'	50275469024	12/07/2020 09:50	Solid	mg/kg	125
Former Exide 20-224	SB-5 0-1'	50275469025	12/07/2020 10:05	Solid	mg/kg	873
Former Exide 20-224	SB-6 0-2'	50275469026	12/07/2020 14:50	Solid	mg/kg	6630
Former Exide 20-224	SB-7 0-2'	50275469028	12/07/2020 14:25	Solid	mg/kg	1990
Former Exide 20-224	SB-8 0-2'	50275469030	12/08/2020 09:10	Solid	mg/kg	1470
Former Exide 20-224	SB-9 2-4'	50275469034	12/07/2020 15:20	Solid	mg/kg	1170
Former Exide 20-224	SB-10 2-4'	50275469036	12/08/2020 09:35	Solid	mg/kg	57.3
Former Exide 20-224	SB-11 0-2'	50275469038	12/08/2020 10:35	Solid	mg/kg	95.6
Former Exide 20-224	SB-12 0-2'	50275469040	12/08/2020 10:05	Solid	mg/kg	1090
Former Exide 20-224	SB-13 0-1'	50275469042	12/08/2020 10:55	Solid	mg/kg	2420
Former Exide 20-224	SB-14 1-2'	50275469043	12/08/2020 10:40	Solid	mg/kg	573
Former Exide 20-224	SB-14 1-2' DUP	50275469044	12/08/2020 10:40	Solid	mg/kg	2140
Former Exide 20-224	SB-15 0-2'	50275469045	12/07/2020 14:10	Solid	mg/kg	140
Former Exide 20-224	SB-16 0-2'	50275469047	12/07/2020 13:20	Solid	mg/kg	28.7
Former Exide 20-224	SB-17 0-2'	50275469050	12/07/2020 11:50	Solid	mg/kg	517
Former Exide 20-224	SB-18 0-2'	50275469052	12/07/2020 12:30	Solid	mg/kg	91.4
Former Exide 20-224	SB-19 0-2'	50275469054	12/07/2020 11:35	Solid	mg/kg	162
Former Exide 20-224	SB-20 0-2'	50275469057	12/07/2020 11:15	Solid	mg/kg	162
Former Exide 20-224	SS-1	50275469059	12/07/2020 10:00	Solid	mg/kg	7360
Former Exide 20-224	SS-2	50275469060	12/09/2020 10:30	Solid	mg/kg	6070
Former Exide 20-224	SS-4	50275469062	12/09/2020 10:34	Solid	mg/kg	8570
Former Exide 20-224	SS-5	50275469063	12/09/2020 10:36	Solid	mg/kg	5620
Former Exide 20-224	SS-6	50275469064	12/09/2020 10:40	Solid	mg/kg	6200
Former Exide 20-224	SS-7	50275469065	12/09/2020 10:42	Solid	mg/kg	4510
Former Exide 20-224	SS-8	50275469066	12/09/2020 10:44	Solid	mg/kg	10300
Former Exide 20-224	SS-9	50275469067	12/09/2020 10:46	Solid	mg/kg	4840
Field Duplicate RPD (SB-14 1-2' & Dup)[2]					%	115.5%
Former Exide Corporation - 2022 Supplemental Phase II						
Exide	SB-21 (0.5-1)		03/30/2022 16:10		mg/kg	295
Exide	SB-22 (2-2.5)		03/30/2022 16:40		mg/kg	154
Exide	SB-23 (0-0.5)		03/30/2022 15:50		mg/kg	365
Exide	SB-24 (0-1)		03/31/2022 10:55		mg/kg	177
Exide	SB-25 (0.5-1)		03/30/2022 15:20		mg/kg	239
Exide	SB-26 (0-0.5)		03/30/2022 14:55		mg/kg	197
Exide	SB-26 (10-15)		03/30/2022 15:05		mg/kg	2.3
Exide	SB-27 (0-0.5)		03/30/2022 13:44		mg/kg	610
Exide	SB-27 (0-0.5) DUP		03/30/2022 13:44		mg/kg	437
Exide	SB-28 (0-1)		03/30/2022 14:00		mg/kg	53.1
Exide	SB-29 (1-1.5)		03/30/2022 13:10		mg/kg	84.4
Exide	SB-30 (1.5-2.0)		03/30/2022 10:17		mg/kg	13900
Exide	SB-31 (0.5-1.0)		03/30/2022 10:25		mg/kg	247
Exide	SB-32 (4-5)		03/31/2022 10:37		mg/kg	57.4
Exide	SB-33 (1.0-2.0)		03/30/2022 11:34		mg/kg	10.2
Exide	SB-34 (3-4)		03/30/2022 14:20		mg/kg	359
Exide	SB-35 (0-0.5)		03/30/2022 12:29		mg/kg	101
Exide	SB-36 (0-0.5)		03/30/2022 12:49		mg/kg	141
Exide	SB-37 (3-4)		03/30/2022 12:07		mg/kg	474
Exide	SB-38 (0-1.0)		03/30/2022 11:44		mg/kg	250
Exide	SB-39 (4-5)		03/30/2022 13:26		mg/kg	11.4
Exide	SB-40 (2-2.5)		03/30/2022 09:51		mg/kg	7.2
Exide	SB-41 (2-3)		03/30/2022 10:03		mg/kg	166
Field Duplicate RPD (SP-27 0-0.5' & Dup)[2]					%	33.0%

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	400
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	800
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	1000
RCG Soil Migration to GW Screening Level[2]					mg/kg	270

Former Exide Corporation - 2022 2nd Supplemental Phase II

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
Exide 22-238	SB-42 0-1'	50328593011	10/14/2022 11:42	Solid	mg/kg	865
Exide 22-238	SB-42 1-2'	50328593012	10/14/2022 11:42	Solid	mg/kg	520
Exide 22-238	SB-42 2-3'	50328593013	10/14/2022 11:42	Solid	mg/kg	205
Exide 22-238	SB-42 3-4'	50328593014	10/14/2022 11:42	Solid	mg/kg	13.4
Exide 22-238	SB-42 4-5'	50328593015	10/14/2022 11:42	Solid	mg/kg	11.8
Exide 22-238	SB-43 0-1'	50328593016	10/14/2022 11:34	Solid	mg/kg	205
Exide 22-238	SB-43 0-1' DUP	50328593017	10/14/2022 11:34	Solid	mg/kg	34.7
Exide 22-238	SB-43 1--2'	50328593018	10/14/2022 11:34	Solid	mg/kg	1760
Exide 22-238	SB-43 2-3'	50328593019	10/14/2022 11:34	Solid	mg/kg	68.8
Exide 22-238	SB-43 3-4'	50328593020	10/14/2022 11:34	Solid	mg/kg	21.6
Exide 22-238	SB-43 4-5'	50328593021	10/14/2022 11:34	Solid	mg/kg	9.9
Exide 22-238	SB-44 0-1'	50328593022	10/14/2022 11:18	Solid	mg/kg	3600
Exide 22-238	SB-44 1-2'	50328593023	10/14/2022 11:18	Solid	mg/kg	137
Exide 22-238	SB-44 2-3'	50328593024	10/14/2022 11:18	Solid	mg/kg	20.0
Exide 22-238	SB-44 3-4'	50328593025	10/14/2022 11:18	Solid	mg/kg	14.2
Exide 22-238	SB-44 4-5'	50328593026	10/14/2022 11:18	Solid	mg/kg	7.2

Field Duplicate RPD (SP-43 0-1' & Dup)[2]					%	142.1%

Former Exide Corporation - 2022 2nd Supplemental Phase II

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
Exide 22-238	SB-5 (0-0.5')	50332111001	11/23/2022 13:05	Solid	mg/kg	2240
Exide 22-238	SB-6 (0-0.5')	50332111002	11/23/2022 12:45	Solid	mg/kg	790
Exide 22-238	SB-13 (0-1')	50332111003	11/23/2022 12:15	Solid	mg/kg	504
Exide 22-238	SB-14 (0-1')	50332111004	11/23/2022 12:03	Solid	mg/kg	278
Exide 22-238	SB-30 (1-3')	50332111005	11/23/2022 12:35	Solid	mg/kg	1760
Exide 22-238	SB-44 (0-1')	50332111006	11/23/2022 11:50	Solid	mg/kg	2220

Former Exide Corporation - 2023 Additional Soil Delineation - Round 1

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
Exide	HS1 20E 0-1 ft	50352753073	8/21/2023		mg/kg	46,900
Exide	HS1 20E 1-2 ft	50352753074	8/21/2023		mg/kg	3,520
Exide	HS1 20S 0-1 ft	50352753071	8/21/2023		mg/kg	2,640
Exide	HS1 20S 1-2 ft	50352753072	8/21/2023		mg/kg	284
Exide	HS1 20W 1-2 ft	50352753075	8/21/2023		mg/kg	474
Exide	SP13 20E 0-6 in	50352753022	8/21/2023		mg/kg	571
Exide	SP13 20E 12-18 in	50352753024	8/21/2023		mg/kg	554
Exide	SP13 20E 18-24 in	50352753025	8/21/2023		mg/kg	317
Exide	SP13 20E 2-3 ft	50352753027	8/21/2023		mg/kg	38.2
Exide	SP13 20E 6-12 in	50352753023	8/21/2023		mg/kg	358
Exide	SP13 20N 0-6 in	50352753015	8/21/2023		mg/kg	421
Exide	SP13 20N 12-18 in	50352753017	8/21/2023		mg/kg	571
Exide	SP13 20N 18-24 in	50352753018	8/21/2023		mg/kg	7.5
Exide	SP13 20N 6-12 in	50352753016	8/21/2023		mg/kg	444
Exide	SP13 20S 0-6 in	50352753019	8/21/2023		mg/kg	587
Exide	SP13 20S 12-18 in	50352753021	8/21/2023		mg/kg	106
Exide	SP13 20S 6-12 in	50352753020	8/21/2023		mg/kg	353
Exide	SP13 20W 0-6 in	50352753028	8/21/2023		mg/kg	1,460
Exide	SP13 20W 12-18 in	50352753030	8/21/2023		mg/kg	342
Exide	SP13 20W 18-24 in	50352753031	8/21/2023		mg/kg	28.1
Exide	SP13 20W 6-12 in	50352753029	8/21/2023		mg/kg	482
Exide	SP13 N 40 0-6 in	50353055072	8/21/2023		mg/kg	822
Exide	SP13 N 40 0-6 in DUP	50353055073	8/21/2023		mg/kg	627
Exide	SP13 W 40-1 0-6 in	50353055078	8/21/2023		mg/kg	1,150
Exide	SP13 W 40-1 0-6 in DUP	50353055079	8/21/2023		mg/kg	1,160
Exide	SP13 W 40-2 0-6 in	50353055074	8/21/2023		mg/kg	2,060
Exide	SP13 W 40-2 0-6 in DUP	50353055075	8/21/2023		mg/kg	1,440
Exide	SP13 W 60-1 0-6 in	50353055076	8/21/2023		mg/kg	1,120
Exide	SP13 W 60-1 0-6 in DUP	50353055077	8/21/2023		mg/kg	1,190
Exide	SP14 20E 0-6 in	50352753041	8/21/2023		mg/kg	151
Exide	SP14 20E 2-3 ft	50352753043	8/21/2023		mg/kg	110
Exide	SP14 20E 6-12 in	50352753042	8/21/2023		mg/kg	162
Exide	SP14 20N 0-6 in	50352753032	8/21/2023		mg/kg	659
Exide	SP14 20N 12-18 in	50352753034	8/21/2023		mg/kg	180
Exide	SP14 20N 3-4 ft	50352753035	8/21/2023		mg/kg	677
Exide	SP14 20N 4-5 ft	50352753036	8/21/2023		mg/kg	48.4

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	400
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	800
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	1000
RCG Soil Migration to GW Screening Level[2]					mg/kg	270
Exide	SP14 20N 6-12 in	50352753033	8/21/2023		mg/kg	223
Exide	SP14 20S 0-6 in	50352753037	8/21/2023		mg/kg	501
Exide	SP14 20S 12-18 in	50352753039	8/21/2023		mg/kg	171
Exide	SP14 20S 18-24 in	50352753040	8/21/2023		mg/kg	61.8
Exide	SP14 20S 6-12 in	50352753038	8/21/2023		mg/kg	719
Exide	SP14 20W 0-6 in	50352753045	8/21/2023		mg/kg	1,050
Exide	SP14 20W 12-18 in	50352753047	8/21/2023		mg/kg	97.5
Exide	SP14 20W 6-12 in	50352753046	8/21/2023		mg/kg	697
Exide	SP14 S 40 0-6 in	50353055080	8/21/2023		mg/kg	640
Exide	SP14 W 40-1 0-6 in	50353055084	8/21/2023		mg/kg	764
Exide	SP14 W 40-2 0-6 in	50353055082	8/21/2023		mg/kg	857
Exide	SP30 20E 0-6 in	50352753008	8/21/2023		mg/kg	192
Exide	SP30 20E 12-18 in	50352753010	8/21/2023		mg/kg	386
Exide	SP30 20E 18-24 in	50352753011	8/21/2023		mg/kg	19.1
Exide	SP30 20E 6-12 in	50352753009	8/21/2023		mg/kg	626
Exide	SP30 20N 0-6 in	50352753001	8/21/2023		mg/kg	428
Exide	SP30 20N 12-18 in	50352753003	8/21/2023		mg/kg	527
Exide	SP30 20N 6-12 in	50352753002	8/21/2023		mg/kg	173
Exide	SP30 20S 0-6 in	50352753004	8/21/2023		mg/kg	338
Exide	SP30 20S 12-18 in	50352753006	8/21/2023		mg/kg	435
Exide	SP30 20S 18-24 in	50352753007	8/21/2023		mg/kg	67.9
Exide	SP30 20S 6-12 in	50352753005	8/21/2023		mg/kg	417
Exide	SP30 20W 0-6 in	50352753012	8/21/2023		mg/kg	133
Exide	SP30 20W 12-18 in	50352753014	8/21/2023		mg/kg	322
Exide	SP30 20W 6-12 in	50352753013	8/21/2023		mg/kg	421
Exide	SP44 20E 0-6 in	50352753056	8/21/2023		mg/kg	1,230
Exide	SP44 20E 12-18 in	50352753058	8/21/2023		mg/kg	8.9
Exide	SP44 20E 6-12 in	50352753057	8/21/2023		mg/kg	90.7
Exide	SP44 20N 0-6 in	50352753048	8/21/2023		mg/kg	557
Exide	SP44 20N 12-18 in	50352753050	8/21/2023		mg/kg	1,490
Exide	SP44 20N 18-24 in	50352753051	8/21/2023		mg/kg	1,870
Exide	SP44 20N 6-12 in	50352753049	8/21/2023		mg/kg	51.6
Exide	SP44 20S 0-6 in	50352753052	8/21/2023		mg/kg	1,060
Exide	SP44 20S 12-18 in	50352753055	8/21/2023		mg/kg	653
Exide	SP44 20S 6-12 in	50352753053	8/21/2023		mg/kg	841
Exide	SP44 20S 6-12 in DUP	50352753054	8/21/2023		mg/kg	1,940
Exide	SP44 20W 0-6 in	50352753059	8/21/2023		mg/kg	4,850
Exide	SP44 20W 12-18 in	50352753061	8/21/2023		mg/kg	108
Exide	SP44 20W 6-12 in	50352753060	8/21/2023		mg/kg	598
Exide	SP44 S 40-1 0-6 in	50352753077	8/21/2023		mg/kg	126
Exide	SP44 S 40-1 6-12 in	50352753078	8/21/2023		mg/kg	121
Exide	SP44 S 40-2 0-6 in	50352753079	8/21/2023		mg/kg	147
Exide	SP44 S 40-2 6-12 in	50352753080	8/21/2023		mg/kg	86.1
Exide	SP44 S 40-3 0-6 in	50352753081	8/21/2023		mg/kg	102
Exide	SP44 S 40-3 6-12 in	50352753082	8/21/2023		mg/kg	96.5
Exide	SP44 W 40-1 0-6 in	50352753083	8/21/2023		mg/kg	1,490
Exide	SP44 W 40-1 0-6 in DUP	50352753084	8/21/2023		mg/kg	1,010
Exide	SP44 W 40-1 6-12 in	50352753085	8/21/2023		mg/kg	3,290
Exide	SP44 W 40-2 0-6 in	50352753086	8/21/2023		mg/kg	860
Exide	SP44 W 40-2 0-6 in DUP	50352753087	8/21/2023		mg/kg	843
Exide	SP44 W 40-2 6-12 in	50352753088	8/21/2023		mg/kg	1,730
Exide	SP44 W 60-1 0-6 in	50352753076	8/21/2023		mg/kg	391
Exide	SP7 20S 0-6 in	50352753062	8/21/2023		mg/kg	2,710
Exide	SP7 20S 12-18 in	50352753065	8/21/2023		mg/kg	381
Exide	SP7 20S 2-3 ft	50352753066	8/21/2023		mg/kg	50.3
Exide	SP7 20S 6-12 in	50352753063	8/21/2023		mg/kg	915
Exide	SP7 20S 6-12 in DUP	50352753064	8/21/2023		mg/kg	2,370
Exide	SP7 20W 0-6 in	50352753067	8/21/2023		mg/kg	3,010
Exide	SP7 20W 12-18 in	50352753069	8/21/2023		mg/kg	222
Exide	SP7 20W 18-24 in	50352753070	8/21/2023		mg/kg	474
Exide	SP7 20W 6-12 in	50352753068	8/21/2023		mg/kg	1,010
Exide	SP7 S 20-1 0-6 in	50353055087	8/21/2023		mg/kg	164
Exide	SP7 S 20-2 0-6 in	50353055088	8/21/2023		mg/kg	103
Exide	SP7 W 20-1 0-6 in	50353055086	8/21/2023		mg/kg	207
Exide	SP9 100 S 0-6 in	50353055060	8/22/2023		mg/kg	804

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	400
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	800
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	1000
RCG Soil Migration to GW Screening Level[2]					mg/kg	270
Exide	SP9 100 S 12-18 in	50353055062	8/22/2023		mg/kg	1,530
Exide	SP9 100 S 6-12 in	50353055061	8/22/2023		mg/kg	687
Exide	SP9 100 SSE 0-6 in	50353055065	8/22/2023		mg/kg	648
Exide	SP9 100 SSE 18-24 in	50353055066	8/22/2023		mg/kg	798
Exide	SP9 100 WNW 12-18 in	50353055071	8/22/2023		mg/kg	668
Exide	SP9 100 WNW 6-12 in	50353055070	8/22/2023		mg/kg	174
Exide	SP9 100 WSW 12-18 in	50353055068	8/22/2023		mg/kg	551
Exide	SP9 100 WSW 18-24 in	50353055069	8/22/2023		mg/kg	453
Exide	SP9 100 WSW 6-12 in	50353055067	8/22/2023		mg/kg	101
Exide	SP9 125 NW 18-24 in	50353055058	8/22/2023		mg/kg	146
Exide	SP9 125 NW 4-5 ft	50353055059	8/22/2023		mg/kg	156
Exide	SP9 125 NW 6-12 in	50353055057	8/22/2023		mg/kg	1,230
Exide	SP9 125 WNW 12-18 in	50353055063	8/22/2023		mg/kg	28.3
Exide	SP9 125 WNW 18-24 in	50353055064	8/22/2023		mg/kg	98.1
Exide	SP9 20E 2-3 ft	50353055006	8/22/2023		mg/kg	405
Exide	SP9 20E 3-4 ft	50353055007	8/22/2023		mg/kg	759
Exide	SP9 20E 6-12 in	50353055005	8/22/2023		mg/kg	52.5
Exide	SP9 20N 2-3 ft	50353055002	8/22/2023		mg/kg	11.6
Exide	SP9 20N 6-12 in	50353055001	8/22/2023		mg/kg	99.8
Exide	SP9 20S 18-24 in	50353055003	8/22/2023		mg/kg	1,150
Exide	SP9 20S 4-5 ft	50353055004	8/22/2023		mg/kg	395
Exide	SP9 20W 12-18 in	50353055009	8/22/2023		mg/kg	1,770
Exide	SP9 20W 18-24 in	50353055010	8/22/2023		mg/kg	7,430
Exide	SP9 20W 6-12 in	50353055008	8/22/2023		mg/kg	8.6
Exide	SP9 28NE 18-24 in	50353055018	8/22/2023		mg/kg	1,020
Exide	SP9 28NE 6-12 in	50353055017	8/22/2023		mg/kg	14.3
Exide	SP9 28NW 12-18 in	50353055023	8/22/2023		mg/kg	874
Exide	SP9 28NW 4-5 ft	50353055024	8/22/2023		mg/kg	99.5
Exide	SP9 28SE 0-6 in	50353055011	8/22/2023		mg/kg	13.2
Exide	SP9 28SE 12-18 in	50353055012	8/22/2023		mg/kg	29.9
Exide	SP9 28SW 18-24 in	50353055026	8/22/2023		mg/kg	6.1
Exide	SP9 28SW 6-12 in	50353055025	8/22/2023		mg/kg	1,320
Exide	SP9 40E 0-6 in	50353055015	8/22/2023		mg/kg	4,600
Exide	SP9 40E 12-18 in	50353055016	8/22/2023		mg/kg	592
Exide	SP9 40E 30E 0-6 in	50353055027	8/22/2023		mg/kg	1,230
Exide	SP9 40E 30E 4-5 ft	50353055029	8/22/2023		mg/kg	113
Exide	SP9 40E 30E 6-12 in	50353055028	8/22/2023		mg/kg	4,420
Exide	SP9 40E 30N 0-6 in	50353055033	8/22/2023		mg/kg	3,590
Exide	SP9 40E 30N 6-12 in	50353055034	8/22/2023		mg/kg	610
Exide	SP9 40E 30S 0-6 in	50353055030	8/22/2023		mg/kg	3,090
Exide	SP9 40E 30S 12-18 in	50353055031	8/22/2023		mg/kg	656
Exide	SP9 40E 30S 3-4 ft	50353055032	8/22/2023		mg/kg	39.7
Exide	SP9 40S 0-6 in	50353055013	8/22/2023		mg/kg	244
Exide	SP9 40S 6-12 in	50353055014	8/22/2023		mg/kg	625
Exide	SP9 40W 12-18 in	50353055019	8/22/2023		mg/kg	27.9
Exide	SP9 40W 18-24 in	50353055020	8/22/2023		mg/kg	652
Exide	SP9 40W 2-3 ft	50353055021	8/22/2023		mg/kg	1,140
Exide	SP9 40W 30N 12-18 in	50353055037	8/22/2023		mg/kg	88.8
Exide	SP9 40W 30N 18-24 in	50353055038	8/22/2023		mg/kg	4,930
Exide	SP9 40W 30N 2-3 ft	50353055039	8/22/2023		mg/kg	1,380
Exide	SP9 40W 30N 2-3 ft (reanalysis)	50353055039	8/22/2023		mg/kg	2,330
Exide	SP9 40W 30S 2-3 ft	50353055035	8/22/2023		mg/kg	260
Exide	SP9 40W 30S 3-4 ft	50353055036	8/22/2023		mg/kg	3,140
Exide	SP9 40W 30W 18-24 in	50353055040	8/22/2023		mg/kg	2,980
Exide	SP9 40W 30W 2-3 ft	50353055041	8/22/2023		mg/kg	639
Exide	SP9 40W 3-4 ft	50353055022	8/22/2023		mg/kg	127
Exide	SP9 60 SW 0-6 in	50353055049	8/22/2023		mg/kg	174
Exide	SP9 60 SW 12-18 in	50353055050	8/22/2023		mg/kg	84.2
Exide	SP9 75 NW 12-18 in	50353055052	8/22/2023		mg/kg	40,500
Exide	SP9 75 NW 18-24 in	50353055053	8/22/2023		mg/kg	15,500
Exide	SP9 75 NW 2-3 ft	50353055054	8/22/2023		mg/kg	1,020
Exide	SP9 75 NW 3-4 ft	50353055055	8/22/2023		mg/kg	1,430
Exide	SP9 75 NW 4-5 ft	50353055056	8/22/2023		mg/kg	17.7

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	**400**
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	**800**
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	**1000**
RCG Soil Migration to GW Screening Level[2]					mg/kg	**270**
Exide	SP9 75 NW 6-12 in	50353055051	8/22/2023		mg/kg	**31,900**
Exide	SP9 75 SE 12-18 in	50353055046	8/22/2023		mg/kg	**457**
Exide	SP9 75 SE 18-24 in	50353055047	8/22/2023		mg/kg	**172**
Exide	SP9 75 SE 2-3 ft	50353055048	8/22/2023		mg/kg	**49.5**
Exide	SP9 75 SSE 0-6 in	50353055042	8/22/2023		mg/kg	**2,090**
Exide	SP9 75 SSE 12-18 in	50353055044	8/22/2023		mg/kg	**2,850**
Exide	SP9 75 SSE 18-24 in	50353055045	8/22/2023		mg/kg	**946**
Exide	SP9 75 SSE 6-12 in	50353055043	8/22/2023		mg/kg	**473**
Exide	SS-101 (0-6')	50353353001	9/6/2023		mg/kg	**4,260**
Exide	SS-108 (0-6')	50353353002	9/6/2023		mg/kg	**1,800**
Exide	SS-111 (0-6')	50353353003	9/6/2023		mg/kg	**5,460**
Exide	SS-112 (0-6')	50353353004	9/6/2023		mg/kg	**3,560**
Exide	SS-113 (0-6')	50353353005	9/6/2023		mg/kg	**5,700**
Exide	SS-114 (0-6')	50353353006	9/6/2023		mg/kg	**18,700**
Exide	SS-116 (0-6')	50353353007	9/6/2023		mg/kg	**5,900**
Exide	SS-117 (0-6')	50353353008	9/6/2023		mg/kg	**2,300**
Exide	SS-118 (0-6')	50353353009	9/6/2023		mg/kg	**3,900**
Exide	SS-121 (0-6')	50353353010	9/6/2023		mg/kg	**3,040**
Exide	SS-122 (0-6')	50353353011	9/6/2023		mg/kg	**15,900**
Exide	SS-123 (0-6')	50353353012	9/6/2023		mg/kg	**3,510**
Exide	SS-124 (0-6')	50353353013	9/6/2023		mg/kg	**3,040**
Exide	SS-125 (0-6')	50353353014	9/6/2023		mg/kg	**2,880**
Exide	SS-126 (0-6')	50353353015	9/6/2023		mg/kg	**4,600**
Field Duplicate RPD (SP13 N 40 0-6 in & DUP)[2]						**26.9%**
Field Duplicate RPD (SP13 W 40-1 0-6 in & DUP)[2]						**0.9%**
Field Duplicate RPD (SP13 W 40-2 0-6 in & DUP)[2]						**35.4%**
Field Duplicate RPD (SP13 W 60-1 0-6 in & DUP)[2]						**6.1%**
Field Duplicate RPD (SP44 20S 6-12 in & DUP)[2]						**79.0%**
Field Duplicate RPD (SP44 W 40-1 0-6 in & DUP)[2]						**38.4%**
Field Duplicate RPD (SP44 W 40-2 0-6 in & DUP)[2]						**2.0%**
Field Duplicate RPD (SP7 20S 6-12 in & DUP)[2]						**88.6%**
Former Exide Corporation - 2023 Additional Soil Delineation - Round 1						
Exide	SP12R 12-18	50359080011	11/01/2023 11:20	Solid	mg/kg	**4,260**
Exide	SP12R 6-12	50359080010	11/01/2023 11:20	Solid	mg/kg	**1,300**
Exide	SP3R 0-6	50359080017	11/02/2023 09:23	Solid	mg/kg	**699**
Exide	SP3R 12-18	50359080020	11/02/2023 09:23	Solid	mg/kg	**234**
Exide	SP3R 5E 0-6	50359080014	11/03/2023 12:36	Solid	mg/kg	**898**
Exide	SP3R 5E 18-24	50359080016	11/03/2023 12:36	Solid	mg/kg	**1,020**
Exide	SP3R 5E 6-12	50359080015	11/03/2023 12:36	Solid	mg/kg	**536**
Exide	SP3R 5W 18-24	50359080013	11/03/2023 12:29	Solid	mg/kg	**267**
Exide	SP3R 5W 6-12	50359080012	11/03/2023 12:29	Solid	mg/kg	**193**
Exide	SP3R 6-12	50359080019	11/02/2023 09:23	Solid	mg/kg	**234**
Exide	SP3R 6-12 DUP	50359080019	11/02/2023 09:23	Solid	mg/kg	**407**
Exide	SP-46 1-2	50359339001	11/01/2023 15:40	Solid	mg/kg	**367**
Exide	SP-46 2-3	50359339002	11/01/2023 15:40	Solid	mg/kg	**755**
Exide	SP-47 12-18	50359339004	11/01/2023 17:03	Solid	mg/kg	**113**
Exide	SP-47 6-12	50359339003	11/01/2023 17:03	Solid	mg/kg	**957**
Exide	SP-48 12-18	50359339006	11/01/2023 16:48	Solid	mg/kg	**15.7**
Exide	SP-48 6-12	50359339005	11/01/2023 16:48	Solid	mg/kg	**791**
Exide	SP-49 0-6	50359339007	11/01/2023 16:38	Solid	mg/kg	**100**
Exide	SP-49 12-18	50359339009	11/01/2023 16:38	Solid	mg/kg	**1,310**
Exide	SP-49 12-18 Dup	50359339009	11/01/2023 16:38	Solid	mg/kg	**983**
Exide	SP-50 0-6	50359339010	11/01/2023 16:24	Solid	mg/kg	**164**
Exide	SP-50 12-18	50359339011	11/01/2023 16:24	Solid	mg/kg	**93.2**
Exide	SP-51 0-6	50359339012	11/01/2023 16:14	Solid	mg/kg	**156**
Exide	SP-51 12-18	50359339013	11/01/2023 16:14	Solid	mg/kg	**173**
Exide	SP-52 12-18	50359339014	11/01/2023 14:47	Solid	mg/kg	**17.5**
Exide	SP-53 18-24	50359339016	11/01/2023 15:04	Solid	mg/kg	**307**
Exide	SP-53 6-12	50359339015	11/01/2023 15:04	Solid	mg/kg	**844**
Exide	SP-54 12-18	50359339018	11/01/2023 12:32	Solid	mg/kg	**159**
Exide	SP-54 6-12	50359339017	11/01/2023 12:32	Solid	mg/kg	**965**
Exide	SP-55 0-6	50359339019	11/01/2023 12:45	Solid	mg/kg	**1,800**
Exide	SP-55 12-18	50359339021	11/01/2023 12:45	Solid	mg/kg	**640**

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	**400**
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	**800**
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	**1000**
RCG Soil Migration to GW Screening Level[2]					mg/kg	**270**
Exide	SP-55 18-24	50359339022	11/01/2023 12:45	Solid	mg/kg	**489**
Exide	SP-55 6-12	50359339020	11/01/2023 12:45	Solid	mg/kg	**730**
Exide	SP-56 12-18	50359338003	11/01/2023 12:11	Solid	mg/kg	**389**
Exide	SP-56 12-18 Dup	50359338003	11/01/2023 12:11	Solid	mg/kg	**435**
Exide	SP-56 18-24	50359338004	11/01/2023 12:11	Solid	mg/kg	**956**
Exide	SP-56 6-12	50359338001	11/01/2023 12:11	Solid	mg/kg	**160**
Exide	SP-57 0-6	50359338005	11/01/2023 11:31	Solid	mg/kg	**1,880**
Exide	SP-57 6-12	50359338006	11/01/2023 11:31	Solid	mg/kg	**217**
Exide	SP-58 0-6	50359338007	11/01/2023 10:55	Solid	mg/kg	**528**
Exide	SP-58 12-18	50359338008	11/01/2023 10:55	Solid	mg/kg	**194**
Exide	SP-59 0-6	50359338009	11/01/2023 10:24	Solid	mg/kg	**144**
Exide	SP5R 0-6	50359080021	11/02/2023 09:42	Solid	mg/kg	**3,000**
Exide	SP5R 12-18	50359080001	11/02/2023 09:42	Solid	mg/kg	**1,430**
Exide	SP5R 18-24	50359080002	11/02/2023 09:42	Solid	mg/kg	**105**
Exide	SP-60 0-6	50359338010	11/01/2023 13:15	Solid	mg/kg	**918**
Exide	SP-60 6-12	50359338011	11/01/2023 13:15	Solid	mg/kg	**1,190**
Exide	SP-61 18-24	50359338012	11/02/2023 14:01	Solid	mg/kg	**1,040**
Exide	SP-61 2-3	50359338013	11/02/2023 14:01	Solid	mg/kg	**386**
Exide	SP-61 4-5	50359338014	11/02/2023 14:01	Solid	mg/kg	**131**
Exide	SP-62 2-3	50359338015	11/02/2023 14:28	Solid	mg/kg	**404**
Exide	SP-62 3-4	50359338016	11/02/2023 14:28	Solid	mg/kg	**35.6**
Exide	SP-63 18-24	50359338017	11/02/2023 14:20	Solid	mg/kg	**12.1**
Exide	SP-63 4-5	50359338018	11/02/2023 14:20	Solid	mg/kg	**6,890**
Exide	SP-63R 1-2	50359338019	11/03/2023 11:56	Solid	mg/kg	**18.5**
Exide	SP-63R 4-5	50359338020	11/03/2023 11:56	Solid	mg/kg	**171**
Exide	SP-64 3-4	50359338021	11/02/2023 14:08	Solid	mg/kg	**8.1**
Exide	SP-65 0-6	50359338022	11/01/2023 10:46	Solid	mg/kg	**319**
Exide	SP-65 12-18	50359340001	11/01/2023 10:46	Solid	mg/kg	**714**
Exide	SP-65 18-24	50359340002	11/01/2023 10:46	Solid	mg/kg	**146**
Exide	SP-66 0-6	50359340003	11/01/2023 17:15	Solid	mg/kg	**851**
Exide	SP-66 12-18	50359340005	11/01/2023 17:15	Solid	mg/kg	**59.3**
Exide	SP-66 6-12	50359340004	11/01/2023 17:15	Solid	mg/kg	**119**
Exide	SP-67 12-18	50359340006	11/03/2023 09:10	Solid	mg/kg	**783**
Exide	SP-67 18-24	50359340007	11/03/2023 09:10	Solid	mg/kg	**151**
Exide	SP-68 0-6	50359340008	11/03/2023 09:28	Solid	mg/kg	**172**
Exide	SP-68 6-12	50359340009	11/03/2023 09:28	Solid	mg/kg	**57.7**
Exide	SP-69 0-6	50359340010	11/03/2023 09:36	Solid	mg/kg	**11,800**
Exide	SP-69 12-18	50359340011	11/03/2023 09:36	Solid	mg/kg	**1,210**
Exide	SP6R 12-18	50359080003	11/02/2023 09:56	Solid	mg/kg	**240**
Exide	SP6R 18-24	50359080004	11/02/2023 09:56	Solid	mg/kg	**170**
Exide	SP-70 0-6	50359340012	11/03/2023 09:45	Solid	mg/kg	**874**
Exide	SP-70 12-18	50359340015	11/03/2023 09:45	Solid	mg/kg	**308**
Exide	SP-70 18-24	50359340016	11/03/2023 09:45	Solid	mg/kg	**103**
Exide	SP-70 6-12	50359340013	11/03/2023 09:45	Solid	mg/kg	**1,540**
Exide	SP-70 6-12 Dup	50359340013	11/03/2023 09:45	Solid	mg/kg	**1,400**
Exide	SP-71 0-6	50359340017	11/03/2023 09:52	Solid	mg/kg	**3,260**
Exide	SP-71 18-24	50359340019	11/03/2023 09:52	Solid	mg/kg	**109**
Exide	SP-71 6-12	50359340018	11/03/2023 09:52	Solid	mg/kg	**760**
Exide	SP-72 0-6	50359340020	11/03/2023 10:09	Solid	mg/kg	**504**
Exide	SP-72 6-12	50359340021	11/03/2023 10:09	Solid	mg/kg	**304**
Exide	SP-73 0-6	50359340022	11/03/2023 10:25	Solid	mg/kg	**437**
Exide	SP-73 6-12	50359472001	11/03/2023 10:25	Solid	mg/kg	**344**
Exide	SP-74 0-6	50359472002	11/03/2023 10:37	Solid	mg/kg	**99.1**
Exide	SP-74 12-18	50359472004	11/03/2023 10:37	Solid	mg/kg	**202**
Exide	SP-74 12-18 DUP	50359472004	11/03/2023 10:37	Solid	mg/kg	**205**
Exide	SP-75 6-12	50359472006	11/03/2023 10:50	Solid	mg/kg	**160**
Exide	SP-76 0-6	50359472005	11/03/2023 11:00	Solid	mg/kg	**651**
Exide	SP-76 6-12	50359472007	11/03/2023 11:00	Solid	mg/kg	**249**
Exide	SP-77 3-4	50359472008	11/03/2023 11:25	Solid	mg/kg	**38,400**
Exide	SP-77 4-5	50359472009	11/03/2023 11:25	Solid	mg/kg	**16,300**
Exide	SP-77 5-7	50359472010	11/03/2023 11:25	Solid	mg/kg	**55**
Exide	SP-78 2-3	50359472011	11/03/2023 11:40	Solid	mg/kg	**559**
Exide	SP-78 3-4	50359472012	11/03/2023 11:40	Solid	mg/kg	**1,630**
Exide	SP-79 12-18	50359472013	11/03/2023 12:11	Solid	mg/kg	**380**
Exide	SP-79 3-4	50359472014	11/03/2023 12:11	Solid	mg/kg	**174**

Table 1
Soil Analytical Results - Lead

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Lead
					CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	**400**
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	**800**
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	**1000**
RCG Soil Migration to GW Screening Level[2]					mg/kg	**270**
Exide	SP7R 12-18	50359080006	11/02/2023 10:05	Solid	mg/kg	**486**
Exide	SP7R 6-12	50359080005	11/02/2023 10:05	Solid	mg/kg	**523**
Exide	SP-80 0-12	50359472015	11/03/2023 12:45	Solid	mg/kg	**150**
Exide	SP-80 12-18	50359472016	11/03/2023 12:45	Solid	mg/kg	**1,300**
Exide	SP-80 9-10	50359472017	11/03/2023 12:45	Solid	mg/kg	**1,930**
Exide	SP-81 3-4	50359472018	11/03/2023 13:01	Solid	mg/kg	**514**
Exide	SP-82 4-5	50359472020	11/03/2023 14:05	Solid	mg/kg	**423**
Exide	SP-82 6-12	50359472019	11/03/2023 14:05	Solid	mg/kg	**306**
Exide	SP-83 2-3	50359472021	11/03/2023 14:36	Solid	mg/kg	**276**
Exide	SP-83 4-5	50359472022	11/03/2023 14:36	Solid	mg/kg	**259**
Exide	SP8R 0-6	50359080007	11/01/2023 15:56	Solid	mg/kg	**1,220**
Exide	SP8R 12-18	50359080009	11/01/2023 15:56	Solid	mg/kg	**162**
Exide	SP8R 6-12	50359080008	11/01/2023 15:56	Solid	mg/kg	**377**
Field Duplicate RPD (SP3R 6-12 & DUP)[2]						**54.0%**
Field Duplicate RPD (SP-49 12-18 & DUP)[2]						**28.5%**
Field Duplicate RPD (SP-56 12-18 & DUP)[2]						**11.2%**
Field Duplicate RPD (SP-70 6-12 & DUP)[2]						**9.5%**
Field Duplicate RPD (SP-74 12-18 & DUP)[2]						**1.5%**

Notes:

Samples alyzed using EPA Method 6010, 6020, 7471, or 7199 (Metals)

mg/kg = milligrams per kilogram

ppm - parts per million

BDL - Below Detection Limits

Blank cells = Not Analyzed

--- No value given in the Risk-based Closure Guide

[1] Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2023

[2] Remediation Closure Guide, Appendix A, Table A-6: Summary Table - 2022

[3] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 2
Soil Lead / TCLP Lead Results

Project ID	Sample ID	Collected Date	Lead (mg/kg)	TCLP Lead (mg/L)
Exide	SS-114 (0-6')	9/6/2023	18,700	221
Exide	SS-122 (0-6')	9/6/2023	15,900	88
Exide	SS-113 (0-6')	9/6/2023	5,700	65.6
Exide	HS1 20E 0-1 ft	8/21/2023	46,900	63.3
Exide	SS-116 (0-6')	9/6/2023	5,900	60
Exide	SS-101 (0-6')	9/6/2023	4,260	43.9
Exide	SP44 20W 0-6 in	8/21/2023	4,850	40.7
Exide	SS-123 (0-6')	9/6/2023	3,510	29.8
Exide	SS-111 (0-6')	9/6/2023	5,460	28.2
Exide	SS-118 (0-6')	9/6/2023	3,900	27.7
Exide	SP9 75 NW 12-18 in	8/22/2023	40,500	23
Exide	SS-126 (0-6')	9/6/2023	4,600	23
Exide	SP9 20W 18-24 in	8/22/2023	7,430	22.7
Exide	SS-108 (0-6')	9/6/2023	1,800	21.1
Exide	SS-112 (0-6')	9/6/2023	3,560	20.8
Exide	SS-121 (0-6')	9/6/2023	3,040	19.2
Exide	SS-125 (0-6')	9/6/2023	2,880	18
Exide	SS-124 (0-6')	9/6/2023	3,040	17.2
Exide 22-238	SB-5 (0-0.5')	11/23/2022	2240	15.1
Exide	SS-117 (0-6')	9/6/2023	2,300	14.6
Exide	SP-57 0-6	11/1/2023	1,880	14.0
Exide	SP9 75 NW 18-24 in	8/22/2023	15,500	12
Exide	SP9 40W 30N 2-3 ft	8/22/2023	1,380	11
Exide	SP5R 0-6	11/2/2023	3,000	9.2
Exide	SP44 W 40-1 0-6 in	8/21/2023	1,490	2.7
Exide	SP-70 6-12 Dup	11/3/2023	1,540	2.4
Exide	SP8R 0-6	11/1/2023	1,220	2.1
Exide	SP9 40W 2-3 ft	8/21/2023	1,140	1.5
Exide 22-238	SB-44 (0-1')	11/23/2022	2220	1.5
Exide	SP-78 3-4	11/3/2023	1,630	1.4
Exide 22-238	SB-13 (0-1')	11/23/2022	504	1.1
Exide	SP44 20E 0-6 in	8/21/2023	1,230	0.92
Exide	SP9 75 NW 2-3 ft	8/22/2023	1,020	0.67
Exide	SP7 20W 6-12 in	8/21/2023	1,010	0.61
Exide 22-238	SB-6 (0-0.5')	11/23/2022	790	0.51
Exide 22-238	SB-30 (1-3')	11/23/2022	1760	0.44
Exide	SP13 20W 0-6 in	8/21/2023	1,460	0.42
Exide	SP9 100 S 12-18 in	8/22/2023	1,530	0.36
Exide	SP9 100 S 0-6 in	8/22/2023	804	0.34
Exide 22-238	SB-14 (0-1')	11/23/2022	278	0.062

Notes:

mg/kg = milligrams per kilogram

mg/L = milligram per liter

TCLP limit for characteristic hazardous waste = 5.0 mg/L

Table 3
Soil Analytical Results - VOCs

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	cis-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Other VOCs
					CAS Number	156-59-2	127-18-4	71-55-6	79-01-6	75-01-4	Varies
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	---	---	---	---	---	**Varies**
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	---	---	---	---	---	**Varies**
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	**2000**	**200**	**600**	**200**	**1000**	**Varies**
RCG Soil Migration to GW Screening Level[2]					mg/kg	**0.41**	**0.045**	**1.4**	**0.036**	**0.014**	**Varies**
Former Exide Corporation - 2020 Phase II											
Former Exide 20-224	SB-6 8'	50275469027	12/07/2020 14:55	Solid	mg/kg	<0.00037	<0.00020	<0.00031	<0.00031	<0.00025	<HHL
Former Exide 20-224	SB-7 8'	50275469029	12/07/2020 14:30	Solid	mg/kg	<0.00043	<0.00023	<0.00036	<0.00035	<0.00029	<HHL
Former Exide 20-224	SB-8 6'	50275469031	12/08/2020 09:15	Solid	mg/kg	<0.00048	<0.00025	<0.00039	<0.00039	<0.00032	<HHL
Former Exide 20-224	SB-8 6' DUP	50275469032	12/08/2020 09:15	Solid	mg/kg	<0.00043	<0.00023	<0.00035	<0.00035	<0.00029	<HHL
Former Exide 20-224	SB-9 14.5'	50275469035	12/07/2020 15:30	Solid	mg/kg	<0.00035	<0.00019	<0.00029	<0.00029	<0.00024	<HHL
Former Exide 20-224	SB-10 3'	50275469037	12/08/2020 09:35	Solid	mg/kg	<0.00057	<0.00030	<0.00047	<0.00047	<0.00038	<HHL
Former Exide 20-224	SB-11 11'	50275469039	12/08/2020 10:45	Solid	mg/kg	<0.00016	<0.00014	<0.00016	<0.00015	<0.00025	<HHL
Former Exide 20-224	SB-12 9'	50275469041	12/08/2020 10:10	Solid	mg/kg	<0.00043	<0.00023	<0.00036	<0.00036	<0.00029	<HHL
Former Exide 20-224	SB-15 12'	50275469046	12/07/2020 14:20	Solid	mg/kg	<0.00032	<0.00017	<0.00026	<0.00026	<0.00021	<HHL
Former Exide 20-224	SB-16 8'	50275469049	12/07/2020 13:40	Solid	mg/kg	<0.00018	<0.000094	<0.00015	<0.00015	<0.00012	<HHL
Former Exide 20-224	SB-17 13.5'	50275469051	12/07/2020 11:50	Solid	mg/kg	<0.00032	<0.00017	<0.00026	<0.00026	<0.00021	<HHL
Former Exide 20-224	SB-18 14'	50275469053	12/07/2020 12:40	Solid	mg/kg	<0.00033	<0.00018	<0.00028	<0.00027	<0.00022	<HHL
Former Exide 20-224	SB-19 8'	50275469056	12/07/2020 11:40	Solid	mg/kg	<0.00034	<0.00018	<0.00028	<0.00028	<0.00023	<HHL
Former Exide 20-224	SB-20 11'	50275469058	12/07/2020 11:25	Solid	mg/kg	<0.00035	<0.00019	<0.00029	<0.00029	<0.00023	<HHL
Former Exide 20-224	TB	50275469020	12/08/2020 08:00	Solid	mg/kg	<0.00043	<0.00023	<0.00036	<0.00036	<0.00029	<HHL
Field Duplicate RPD [3]					%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Former Exide Corporation - 2022 2nd Supplemental Phase II											
Exide 22-238	HS-1 2'	50328593001	10/14/2022 10:53	Solid	mg/kg	**1.7**	**11.6**	<0.0024	**210**	<0.00039	<HHL
Exide 22-238	HS-1 6'	50328593002	10/14/2022 10:53	Solid	mg/kg	**2.7**	**0.11**	<0.0031	**288**	<0.00051	<HHL
Exide 22-238	HS-2 5'	50328593032	10/14/2022 10:15	Solid	mg/kg	<0.0016	<0.0020	**0.71**	<0.0023	<0.00035	<HHL
Exide 22-238	HS-2 6'	50328593003	10/14/2022 10:15	Solid	mg/kg	<0.0013	<0.0017	**0.46**	<0.0019	<0.00029	<HHL
Exide 22-238	HS-2 7'	50328593004	10/14/2022 10:15	Solid	mg/kg	<0.0016	<0.0020	**1.5**	<0.0023	<0.00035	<HHL
Exide 22-238	HS-2 7' DUP	50328593005	10/14/2022 10:15	Solid	mg/kg	<0.0017	<0.0022	**1.1**	<0.0025	<0.00038	<HHL
Exide 22-238	HS-3 5'	50328593006	10/14/2022 09:38	Solid	mg/kg	<0.0012	<0.0015	**0.0051**	**0.0022 J**	<0.00027	<HHL
Exide 22-238	HS-3 6'	50328593007	10/14/2022 09:38	Solid	mg/kg	<0.0022	<0.0029	**0.0057 J**	**0.0041 J**	<0.00050	<HHL
Exide 22-238	HS-3 8'	50328593008	10/14/2022 09:38	Solid	mg/kg	<0.0016	<0.0020	**0.010**	**0.031**	<0.00035	<HHL
Exide 22-238	HS-4 5'	50328593031	10/14/2022 09:52	Solid	mg/kg	<0.0017	<0.0022	**0.026**	<0.0025	<0.00038	<HHL
Exide 22-238	HS-4 6'	50328593033	10/14/2022 09:52	Solid	mg/kg	<0.0016	<0.0020	<0.0021	<0.0023	<0.00035	<HHL
Exide 22-238	HS-4 8'	50328593010	10/14/2022 09:52	Solid	mg/kg	<0.0016	<0.0021	**0.029**	<0.0024	<0.00036	<HHL
Exide 22-238	TB	50328593030	10/14/2022 08:00	Solid	mg/kg	<0.0016	<0.0021	<0.0022	<0.0024	<0.00036	<HHL
Field Duplicate RPD [3]					%	0.0%	0.0%	**30.8%**	0.0%	0.0%	0.0%
Former Exide Corporation - 2023 Additional Soil Delineation - Round 1											
Exide	HS-1 20E 4-5'	50352366006	08/21/2023 14:19	Solid	mg/kg	<0.00039	<0.00039	<0.00037	<0.00046	<0.00039	BDL
Exide	HS-1 20E 5-6'	50352366007	08/21/2023 14:24	Solid	mg/kg	<0.00035	<0.00035	<0.00033	<0.00042	<0.00035	BDL
Exide	HS-1 20E 6-7'	50352366008	08/21/2023 14:24	Solid	mg/kg	<0.00034	<0.00035	<0.00032	<0.00041	<0.00034	BDL
Exide	HS-1 20E 7-8'	50352366009	08/21/2023 14:24	Solid	mg/kg	<0.00037	<0.00037	<0.00035	**0.00069 J**	<0.00037	BDL
Exide	HS-1 20E 8-9'	50352366010	08/21/2023 14:24	Solid	mg/kg	<0.00031	<0.00031	<0.00029	**0.0049**	<0.00031	BDL
Exide	HS-1 20E 12-12.5'	50352366011	08/21/2023 14:29	Solid	mg/kg	**0.019**	**0.0015 J**	<0.00028	**0.18**	<0.00030	BDL
Exide	HS-1 20S 3-4'	50352366012	08/21/2023 14:45	Solid	mg/kg	<0.00035	<0.00035	<0.00032	<0.00041	<0.00035	BDL
Exide	HS-1 20S 5-6'	50352366013	08/21/2023 14:50	Solid	mg/kg	<0.00035	<0.00036	<0.00033	<0.00042	<0.00035	BDL
Exide	HS-1 20S 6-7'	50352366014	08/21/2023 14:50	Solid	mg/kg	<0.00033	<0.00033	<0.00031	**0.0018 J**	<0.00033	BDL
Exide	HS-1 20S 7-8'	50352366015	08/21/2023 14:50	Solid	mg/kg	<0.00046	<0.00046	<0.00043	<0.00055	<0.00046	BDL
Exide	HS-1 20S 8-9'	50352366016	08/21/2023 14:50	Solid	mg/kg	<0.00038	<0.00039	<0.00036	**0.012**	<0.00038	BDL
Exide	HS-1 20S 8-9' DUP	50352366017	08/21/2023 14:50	Solid	mg/kg	<0.00036	<0.00036	<0.00033	**0.012**	<0.00035	BDL
Exide	HS-1 20S 10-11'	50352366018	08/21/2023 14:55	Solid	mg/kg	**0.022**	<0.00032	<0.00030	<0.00038	<0.00032	BDL
Exide	HS-1 20W 4-5'	50352366001	08/21/2023 15:30	Solid	mg/kg	<0.00047	**0.0053 J**	<0.00044	**1.9**	<0.00047	BDL
Exide	HS-1 20W 5-6'	50352366002	08/21/2023 15:35	Solid	mg/kg	<0.00041	<0.00041	<0.00038	**0.026**	<0.00041	BDL
Exide	HS-1 20W 6-7'	50352366003	08/21/2023 15:35	Solid	mg/kg	<0.00034	**0.0017 J**	<0.00032	**0.14**	<0.00034	BDL
Exide	HS-1 20W 7-8'	50352366004	08/21/2023 15:35	Solid	mg/kg	<0.00030	**0.0045**	<0.00028	**1.1**	<0.00030	BDL
Exide	HS-1 20W 8-9'	50352366005	08/21/2023 15:35	Solid	mg/kg	<0.00036	**0.0046 J**	<0.00034	**0.68**	<0.00036	BDL
Exide	TB-1	50352366019	08/21/2023 08:00	Solid	mg/kg	<0.00037	<0.00037	<0.00034	<0.00044	<0.00037	BDL
Field Duplicate RPD (HS-1 20S 8-9' & DUP)[2]					%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%
Former Exide Corporation - 2023 Additional Soil Delineation - Round 2											
Exide	HS-1 10E 1'	50358579001	11/02/2023 10:20	Solid	mg/kg	<0.030	**0.10 J**	<0.027	**9.5**	<0.030	BDL
Exide	HS-1 10E 1' DUP	50358579002	11/02/2023 10:20	Solid	mg/kg	<0.00066	**0.0027 J**	<0.00058	**0.36**	<0.00065	BDL
Exide	HS-1 10E 7'	50358579003	11/02/2023 10:25	Solid	mg/kg	<0.00043	<0.00043	<0.00040	**0.022**	<0.00043	BDL
Exide	HS-1 10S 1'	50358579004	11/02/2023 10:40	Solid	mg/kg	<0.00041	<0.00041	<0.00038	**0.019**	<0.00041	BDL
Exide	HS-1 10S 5'	50358579005	11/02/2023 10:40	Solid	mg/kg	<0.00056	**0.0019 J**	<0.00052	**0.4**	<0.00056	BDL
Exide	HS-1 10S 7.5-10'	50358579006	11/02/2023 10:45	Solid	mg/kg	**0.00057 J**	<0.00033	<0.00031	**0.052**	<0.00033	BDL
Exide	HS-1 10W 2'	50358579007	11/02/2023 11:00	Solid	mg/kg	**0.01**	**0.36**	<0.00051	**29.5**	<0.00057	BDL
Exide	HS-1 10W 3-4'	50358579008	11/02/2023 11:00	Solid	mg/kg	**0.38 J**	**6.5**	<0.050	**746**	<0.056	BDL
Exide	HS-1 10W 5'	50358579009	11/02/2023 11:00	Solid	mg/kg	**0.91**	**1.4**	<0.056	**297**	<0.063	BDL
Exide	HS-1 10W 7-8'	50358579010	11/02/2023 11:05	Solid	mg/kg	**0.069**	**0.0067**	<0.00041	**5.7**	<0.00046	BDL
Exide	HS-5 20E 4'	50358579011	11/02/2023 11:35	Solid	mg/kg	<0.00044	<0.00046	**0.026**	**0.0013 J**	<0.00043	BDL
Exide	HS-5 20E 9'	50358579012	11/02/2023 11:40	Solid	mg/kg	**0.009**	<0.00042	**0.044**	**0.1**	<0.00040	BDL
Exide	HS-5 20N 7.5'	50358579013	11/02/2023 12:10	Solid	mg/kg	<0.00036	<0.00038	**0.0010 J**	**0.026**	<0.00036	BDL
Exide	HS-5 20W 3'	50358579014	11/02/2023 12:40	Solid	mg/kg	**9.7**	**10.8**	**0.24 J**	**1040**	<0.031	BDL
Exide	HS-5 20W 4.5'	50358579015	11/02/2023 12:40	Solid	mg/kg	**0.13**	**0.0026 J**	<0.00035	**2.4**	<0.00039	BDL
Exide	HS-5 20W 6'	50358579016	11/02/2023 12:45	Solid	mg/kg	**0.046**	**0.0011 J**	<0.00031	**0.8**	<0.00033	BDL
Exide	HS-5 3'	50358579017	11/02/2023 13:10	Solid	mg/kg	**0.27 J**	**5.1**	**0.53 J**	**87.2**	<0.18	BDL
Exide	HS-5 6'	50358579018	11/02/2023 13:15	Solid	mg/kg	**0.33**	**0.18**	**0.034**	**33.4**	<0.00042	BDL
Exide	HS-5 8-10'	50358579019	11/02/2023 13:15	Solid	mg/kg	**0.0048**	**0.0063**	**0.0011 J**	**1.1**	<0.00031	BDL
Exide	TB-1	50358579020	11/02/2023 08:00	Solid	mg/kg	<0.00037	<0.00037	<0.00034	**0.00093 J**	<0.00037	BDL
Field Duplicate RPD (HS-1 10E 1' & DUP)[2]					%	0.0%	**189.5%**	0.0%	**185.4%**	0.0%	0.0%

Notes:

Samples analyzed using EPA SW-846 Method 8260

mg/kg = milligrams per kilogram

VOCs = Volatile Organic Compounds

BDL - Below Detection Limits

[1] Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2023

[2] Remediation Closure Guide, Appendix A, Table A-6: Summary Table - 2022

[3] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 4
Groundwater Analytical Results - VOCs

Project ID	Sample ID	Collected Date	Units	cis-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Other VOCs
			CAS Number	156-59-2	127-18-4	71-55-6	79-01-6	75-01-4	Varies
RbCG Residential Groundwater Human Health Level [1]			ug/L	70	5	200	5	2	Varies
Former Exide Corporation - 2020 Phase II ESA									
Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	**6.7**	<0.83	**66.0**	**49.1**	<0.42	BDL
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	**4.3 J**	<0.83	<0.52	**18.7**	<0.42	BDL
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	<1.3	<0.83	<0.52	<1.1	<0.42	BDL
Former Exide 20-224	SB-GW-8 DUP	12/09/2020 14:46	ug/L	<1.3	<0.83	<0.52	<1.1	<0.42	BDL
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	<1.3	<0.83	<0.52	<1.1	<0.42	BDL
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	<1.3	<0.83	<0.52	<1.1	<0.42	BDL
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	<1.3	<0.83	<0.52	<1.1	<0.42	BDL
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	<1.3	<0.83	<0.52	<1.1	<0.42	BDL
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	DRUM	12/09/2020 18:30	ug/L	<0.96	<0.75	<0.70	**0.87 J**	<0.46	BDL
Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<0.96	<0.75	<0.70	<0.73	<0.46	BDL
Former Exide 20-224	TB	12/08/2020 08:00	ug/L	<0.96	**1.1 J**	<0.70	<0.73	<0.46	BDL
Field Duplicate RPD (SB-GW-8 & Dup) [2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Former Exide Corporation - 2022 Supplemental Phase II ESA									
Exide	SB-GW-21	03/31/2022 12:26	ug/L	<0.79	<0.70	<0.69	<0.73	<0.42	BDL
Exide	SB-GW-22	03/31/2022 13:23	ug/L	<0.79	<0.70	<0.69	<0.73	<0.42	BDL
Exide	SB-GW-23	03/31/2022 10:38	ug/L	**1.3 J**	<0.70	**1.8 J**	**5.1**	<0.42	BDL
Exide	SB-GW-23 DUP	03/31/2022 10:38	ug/L	**1.3 J**	<0.70	**1.6 J**	**5.1**	<0.42	BDL
Exide	SB-GW-24	03/31/2022 16:02	ug/L	<0.79	<0.70	<0.69	**1.0 J**	<0.42	BDL
Exide	SB-GW-25	03/31/2022 09:34	ug/L	<0.79	<0.70	<0.69	**0.84 J**	<0.42	BDL
Exide	SB-GW-26	03/31/2022 14:28	ug/L	<0.79	<0.70	<0.69	<0.73	<0.42	BDL
Exide	MW-5	04/01/2022 09:54	ug/L	**6.8**	<0.70	<0.69	**35.2**	<0.42	BDL
Exide	EB-1	04/01/2022 15:27	ug/L	<0.79	<0.70	<0.69	<0.73	<0.42	BDL
Exide	TB-1	04/01/2022 16:00	ug/L	<0.79	<0.70	<0.69	<0.73	<0.42	BDL
Field Duplicate RPD (SB-GW-23 & Dup) [2]			%	**0.0%**	0.0%	**11.8%**	**0.0%**	0.0%	0.0%
Former Exide Corporation - 2023 Additional Soil Delineation - Round 2									
Exide GW 23-227	HS1-10E	11/07/2023 15:17	ug/L	**7.4**	<0.36	<0.31	**41.6**	<0.40	BDL
Exide GW 23-227	HS1-10W	11/07/2023 14:28	ug/L	**6.1**	<0.36	<0.31	**63.9**	<0.40	BDL
Exide GW 23-227	HS1-10W Dup	11/07/2023 14:28	ug/L	**6.0**	<0.36	<0.31	**65**	<0.40	BDL
Exide GW 23-227	MW-5 (SB-7)	11/07/2023 15:58	ug/L	**16.9**	<0.36	<0.31	**67.6**	<0.40	BDL
Exide GW 23-227	HS-5	11/07/2023 17:20	ug/L	**22.0**	**5.6**	**2.9 J**	**468**	<0.35	BDL
Exide GW 23-227	EB-1	11/07/2023 18:20	ug/L	<0.34	<0.35	<0.30	**1.0 J**	<0.35	BDL
Exide GW 23-227	TB-1	11/07/2023 08:00	ug/L	<0.34	<0.35	<0.30	<0.31	<0.35	BDL
Field Duplicate RPD (HS1-10W & DUP)2			%	**1.7%**	0%	0%	**1.7%**	0%	0%

Notes:

Samples analyzed using EPA SW-846 Method 5030B/8260

ug/L = micrograms per liter

VOCs = Volatile Organic Compounds

BDL = Below Detection Limits

[1] Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2023

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 5
Groundwater Analytical Results - Lead

Project ID	Sample ID	Collected Date	Units	Lead	Lead - Field Filtered
		CAS Number		7439-92-1	7439-92-1
RbCG Residential Groundwater Human Health Level[1]			ug/L	20	20

Former Exide Corporation - 2021 Phase II

Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	**1100**	**40.3**
Former Exide 20-224	SB-GW-6 DUP	12/09/2020 14:05	ug/L	**726**	
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	**634**	**101**
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	**37.4**	
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	**331**	**32.2**
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	**8.9 J**	
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	**55.0**	
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	**5.1 J**	
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	**17.2**	
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	<3.5	
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	**302**	<2.3
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	<3.5	
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	<3.5	
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	**172**	**41.1**
Former Exide 20-224	DRUM	12/09/2020 18:30	ug/L	**233**	

Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<3.5	
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<3.5	

Field Duplicate RPD (SB-GW-6 & Dup)[3]		%	**41.0%**	

Former Exide Corporation - 2022 Supplemental Phase II

Exide	MW-1	04/01/2022 12:37	ug/L	**13.2**	<2.3
Exide	MW-2	04/01/2022 11:46	ug/L	<2.3	<2.3
Exide	MW-3	04/01/2022 10:50	ug/L	<2.3	<2.3
Exide	MW-4	04/01/2022 13:15	ug/L	<2.3	<2.3
Exide	MW-4 DUP	04/01/2022 13:15	ug/L	<2.3	
Exide	MW-5	04/01/2022 09:54	ug/L	**2.4 J**	<2.3

Field Duplicate RPD (MW-4 & Dup)[3]		%	0.0%	

Notes:

Samples analyzed using EPA Methods 6010, 6020, and 7471 (Metals)

Hexavalent Chromium samples Field Filtered and analyzed using EPA Method 7199

ug/L -- micrograms per Liter

ppb - parts per billion

Blank cells - Not Analyzed

[1] Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2023

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 6
Exterior Soil Gas Analytical Results – VOCs

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl chloride	Other VOCs
					CAS Number	71-55-6	156-59-2	127-18-4	79-01-6	75-01-4	
RbCG Residential Exterior Soil Gas Human Health Levels					ug/m3	**50000**	**---**	**400**	**20**	**20**	**Varies**
RbCG Commercial/Industrial Exterior Soil Gas Human Health Levels					ug/m3	**200000**	**---**	**2000**	**90**	**300**	**Varies**
RbCG **Large** Commercial/Industrial Exterior Soil Gas Human Health Levels					ug/m3	**2000000**	**---**	**20000**	**900**	**3000**	**Varies**
Exide 22-238	A-1	0006580-02	09/27/2022	Soil Gas	µg/m³	**0.86**	<0.94	<1.22	**2.87**	<0.62	NA
	A-2	0006580-03	09/27/2022	Soil Gas	µg/m³	**976 E**	<0.94	<1.21	**15.1**	**1.28**	NA
	A-3	0006580-04	09/27/2022	Soil Gas	µg/m³	**843 E**	<0.94	**1.73**	**42**	**0.84**	NA
	A-5	0006580-05	09/27/2022	Soil Gas	µg/m³	**3.2**	**49.5**	**296**	**5,720 E**	**3.14**	NA
	B-1	0006580-06	09/27/2022	Soil Gas	µg/m³	**0.7**	<0.94	<1.22	**18.3**	<0.62	NA
	B-2	0006580-07	09/27/2022	Soil Gas	µg/m³	**260 E**	<0.94	<1.21	**8.11**	**1.2**	NA
	B-3	0006580-08	09/27/2022	Soil Gas	µg/m³	**24.5**	<0.94	**3.75**	**47.9**	<0.61	NA
	B-5	0006580-09	09/27/2022	Soil Gas	µg/m³	**8.84**	<0.93	**6.17**	**299**	<0.61	NA
	C-1	0006580-10	09/27/2022	Soil Gas	µg/m³	**0.52**	<0.94	<1.22	<1.51	<0.62	NA
	C-2	0006580-11	09/27/2022	Soil Gas	µg/m³	**8.48**	<0.94	<1.22	**11.1**	<0.62	NA
	C-3	0006580-12	09/27/2022	Soil Gas	µg/m³	**1.5**	<0.94	**1.96**	**80.4**	<0.61	NA
	C-4	0006580-13	09/27/2022	Soil Gas	µg/m³	**1.05**	<0.94	**1.47**	**5.8**	<0.61	NA
	C-5	0006580-14	09/27/2022	Soil Gas	µg/m³	**0.82**	<0.94	<1.21	<1.50	<0.61	NA
	C-6	0006580-15	09/27/2022	Soil Gas	µg/m³	**0.6**	<0.93	<1.21	<1.50	<0.61	NA
	D-1	0006580-16	09/27/2022	Soil Gas	µg/m³	**0.66**	<0.94	<1.22	<1.51	<0.62	NA
	D-2	0006580-17	09/27/2022	Soil Gas	µg/m³	**0.67**	<0.94	<1.22	<1.51	<0.62	NA
	D-3	0006580-18	09/27/2022	Soil Gas	µg/m³	**1.43**	<0.94	<1.21	**2.93**	<0.61	NA
	D-4	0006580-19	09/27/2022	Soil Gas	µg/m³	**0.83**	<0.94	<1.21	<1.50	<0.61	NA
	D-5	0006580-20	09/27/2022	Soil Gas	µg/m³	**0.98**	<0.93	<1.21	<1.50	<0.61	NA
	D-6	0006580-21	09/27/2022	Soil Gas	µg/m³	**0.52**	<0.93	<1.21	<1.50	<0.61	NA
	SGeS-1	0006580-22	09/27/2022	Soil Gas	µg/m³	<0.47	<0.94	<1.22	<1.51	<0.62	NA
	SGeS-2	0006580-23	09/27/2022	Soil Gas	µg/m³	<0.47	<0.94	<1.21	<1.50	<0.61	NA
	SGeS-3	0006580-24	09/27/2022	Soil Gas	µg/m³	**0.8**	<0.94	<1.21	<1.50	<0.61	NA
	TB	0006580-01	09/27/2022	Air	µg/m³	<0.47	<0.93	<1.21	<1.50	<0.61	NA

Notes:

VOCs = Volatile Organic Compounds

BDL = Below Detection Limits

Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2022

R2 Table 1 is calculated as described in IDEM’s Risk-based Closure Guide Chapter 3 and Appendix A assuming a total HQ of 1 and a risk level of 10^{-5}.

Table 7
Sub-Slab Soil Gas and Conduit Vapor
Analytical Results – VOCs

Project ID	Sample ID	Collected Date	Matrix	Units	1,1,1-Trichloroethane	1,1-Dichloroethane	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Other VOCs
	CAS Number				71-55-6	75-34-3	156-59-2	127-18-4	156-60-5	79-01-6	75-01-4	Varies
Residential Sub-Slab Soil Gas Human Health Levels				ug/m3	**200000**	**600**	**---**	**1000**	**1,000**	**70**	**60**	**Varies**
Commercial/Industrial Sub-Slab Soil Gas and Sewer Gas Human Health Levels				ug/m3	**700000**	**3,000**	**---**	**6000**	**6,000**	**300**	**900**	**Varies**
LARGE Commercial/Industrial Sub-Slab Soil Gas and Sewer Gas Human Health Levels				ug/m3	**7000000**	**30,000**	**---**	**60000**	**60,000**	**3000**	**9000**	**Varies**
Exide 22-238	CV-1	09/27/2022	Sewer Gas	µg/m³	**19.3**		<0.94	**47**		**18**	<0.62	NA
EXIDE	SGSAN-1	8/29/2023	Sewer Gas	ug/m3	**2.06**	**0.657 J**	**0.856**	**2.74**	<0.267	**4.3**	<0.243	NA
EXIDE	SGSAN-2	8/29/2023	Sewer Gas	ug/m3	**6.36**	**1.11**	**2.87**	**4.62**	<0.267	**15.7**	<0.243	NA
Exide 22-238	SGss-1	09/27/2022	Soil Gas	µg/m³	**299 E**		**2.61**	**30**		**2,600 E**	**2.13**	NA
Exide 22-238	SGss-2	09/27/2022	Soil Gas	µg/m³	**1,270 E**		<0.94	<1.22		**27.6**	**2.51**	NA
EXIDE	SGSS-1 (2)	8/29/2023	Soil Gas	ug/m3	**9,300**	**54.5**	**1,210**	**9,300**	**354**	**257,000**	<4.86	NA
EXIDE	SGSS-2 (2)	8/29/2023	Soil Gas	ug/m3	**974**	**41.7**	**56.3**	**1.85**	**9.67**	**41.6**	<0.243	NA
EXIDE	SGSS-3	8/29/2023	Soil Gas	ug/m3	**30,000**	**16.8**	**1.01**	**9.23**	**0.408 J**	**1030**	<0.243	NA
EXIDE	SGSS-4	8/29/2023	Soil Gas	ug/m3	**9,030**	**93.4**	<0.311	**1.06 J**	<0.267	**3.09**	<0.243	NA
EXIDE	SGSS-5	8/29/2023	Soil Gas	ug/m3	**4,090**	**1.64**	<0.311	**8.89**	<0.267	**1.99**	<0.243	NA
EXIDE	SGSS-6	8/29/2023	Soil Gas	ug/m3	**351**	<2.9	**7.25 J**	**217**	**20.7**	**99,700**	<2.43	NA

Notes:

VOCs = Volatile Organic Compounds

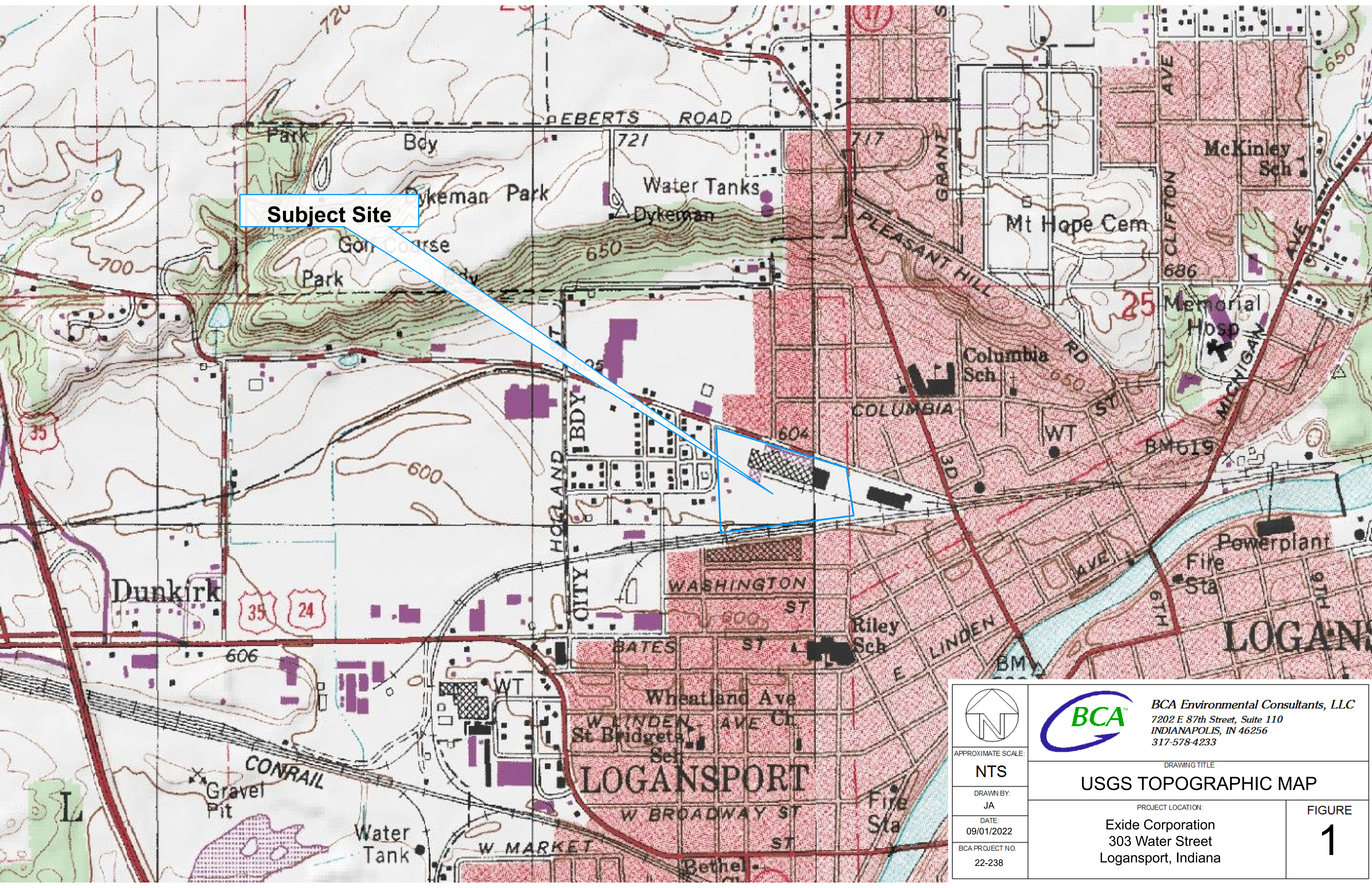
Blank Cells - Not Analyzed

Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2022

R2 Table 1 is calculated as described in IDEM's Risk-based Closure Guide Chapter 3 and Appendix A assuming a total HQ of 1 and a risk level of 10^{-5}.

Figures

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947



APPROXIMATE SCALE: NTS

DRAWN BY: JA

DATE: 09/01/2022

BCA PROJECT NO. 22-238

BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
INDIANAPOLIS, IN 46256
317-578-4233

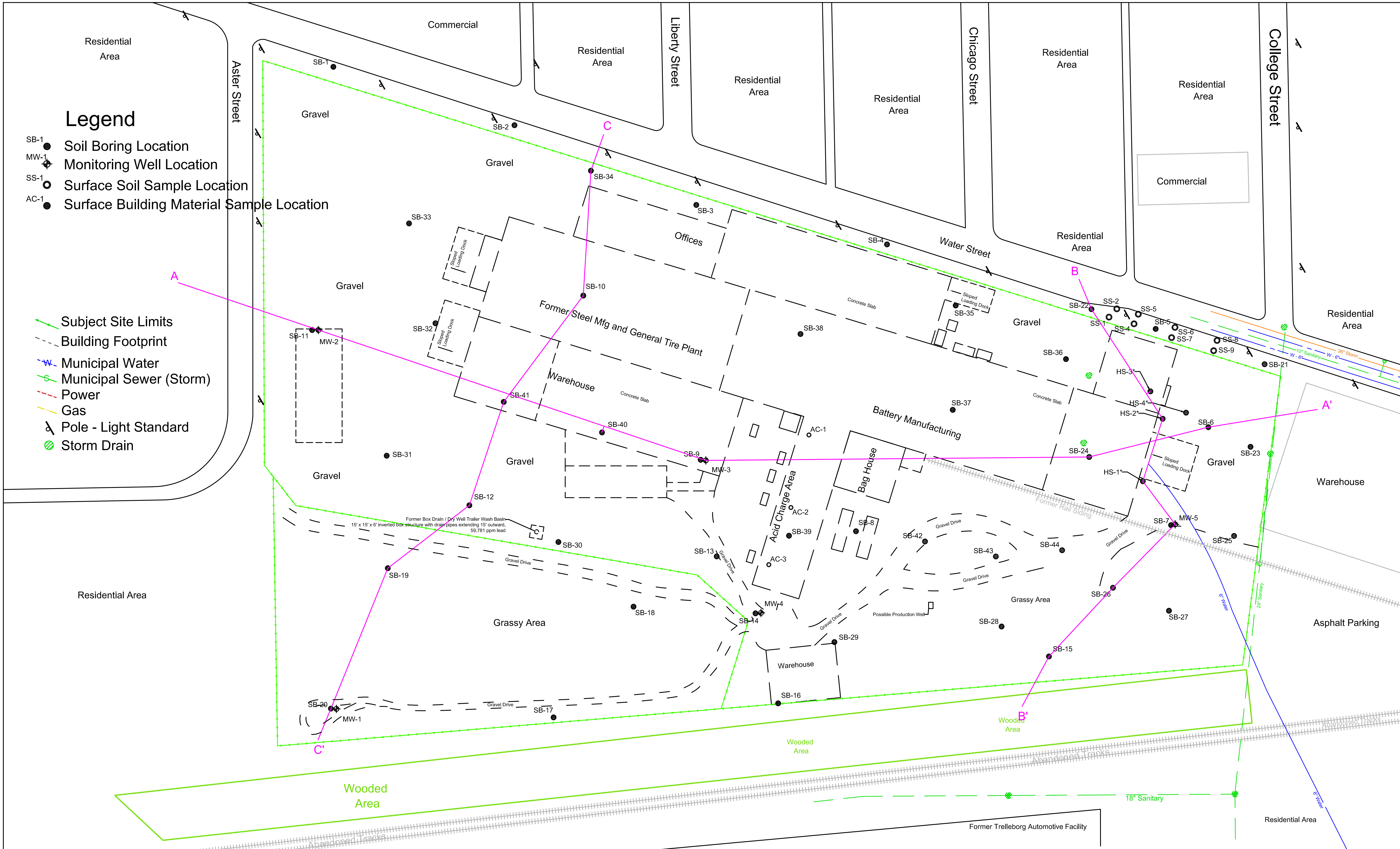
DRAWING TITLE

USGS TOPOGRAPHIC MAP

PROJECT LOCATION:

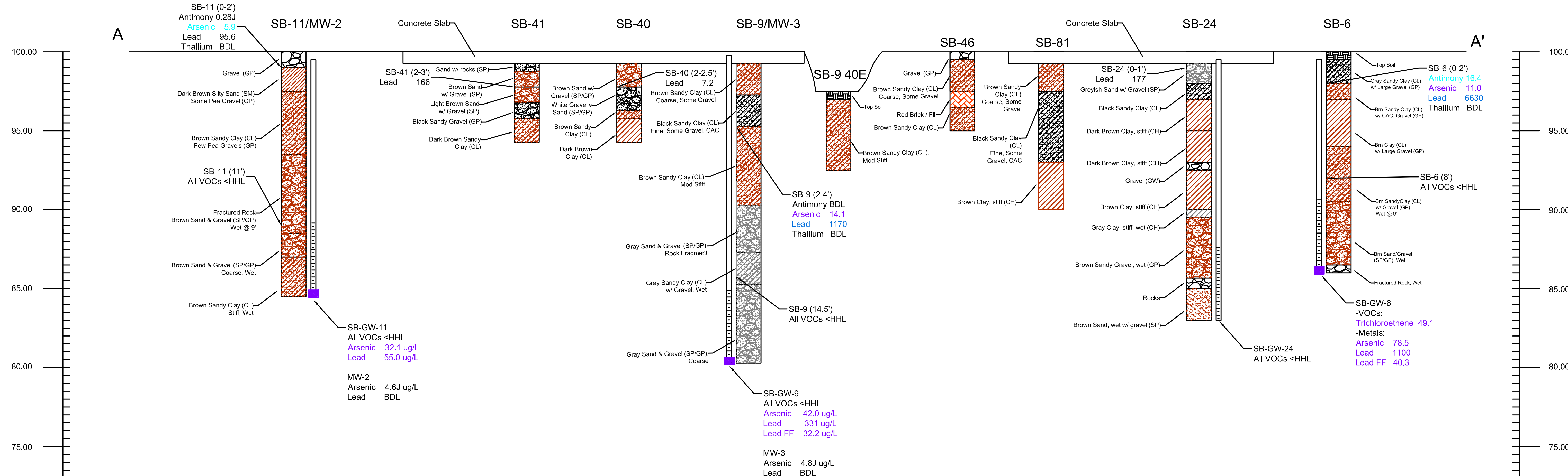
Exide Corporation
303 Water Street
Logansport, Indiana

FIGURE 1



BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
12/05/2022	Site Layout Sample Locations	Former Exide Corporation 303 Water Street Logansport, Indiana	D Scovel, LPG	2
SCALE: 1" = 100'			BCA PROJECT NO. 22-140	



Legend

100.00' SURFACE ELEVATION*

100.00' TOC = TOP OF CASING ELEVATION*

- TOPSOIL
- CONCRETE OR ASPHALT
- SAND
- SAND AND GRAVEL
- SILTY CLAY
- CLAY
- BEDROCK

Groundwater

- Sample Exceeds RbCG R-HHL

RbCG = Risk-based Closure Guide (R2)

R-HHL = Residential Groundwater Human Health Level

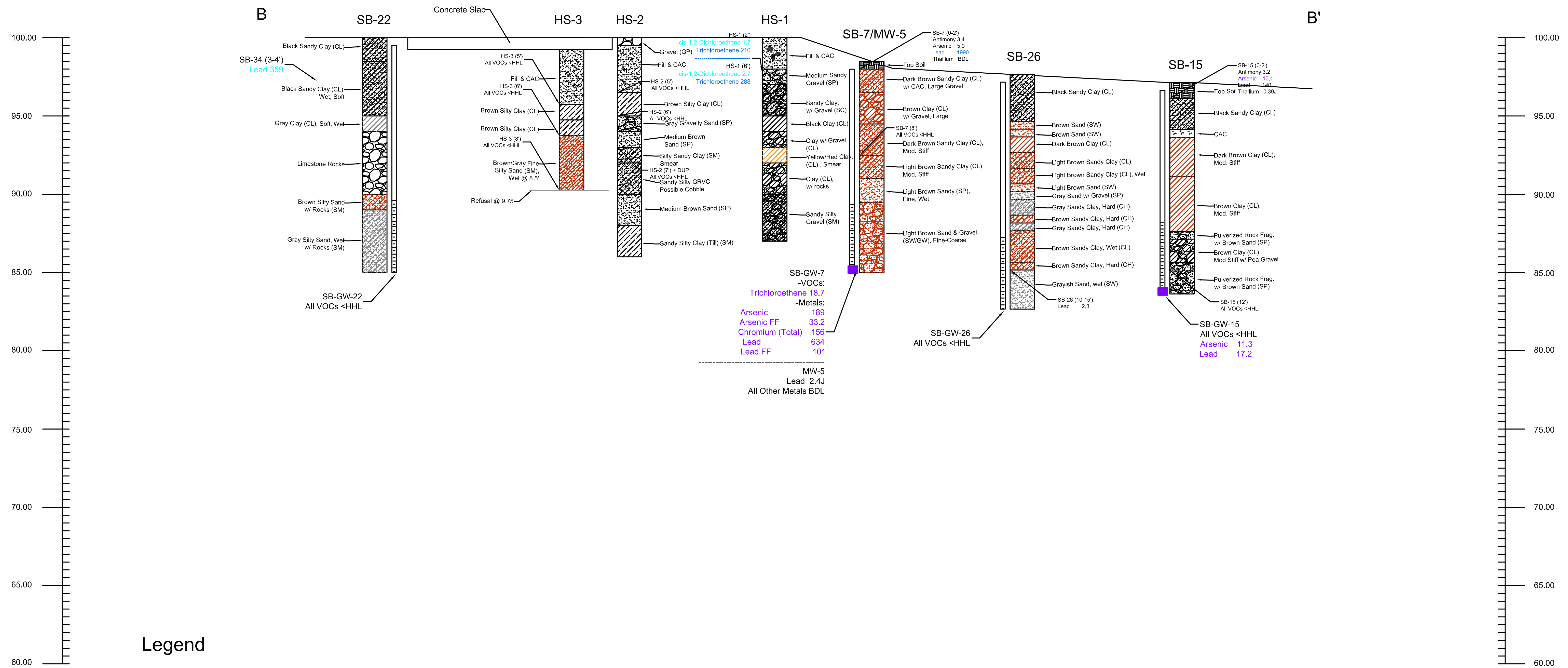
Soil

- Sample Exceeds RbCG Direct Contact HHL
- Sample Exceeds RbCG Comm/Industrial Direct Contact HHL
- Sample Exceeds RbCG Excavation Direct Contact HHL
- Sample Exceeds OLD RCG Migration to GW

RbCG = Risk-based Closure Guide (R2)

RCG = Remediation Closure Guide

BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	VERTICAL EXAGERATION 8 X	DATE: 6/20/2024 HORIZONTAL SCALE: 1"= 50'	DRAWING TITLE Geological Cross Section A - A'	PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana	DRAWN BY: dr BCA PROJECT NO. 22-140	FIGURE 6a



Legend

100.00' SURFACE ELEVATION*

100.00' TOC = TOP OF CASING ELEVATION*

TOPSOIL

CONCRETE OR ASPHALT

SAND

SAND AND GRAVEL

SILTY CLAY

CLAY

BEDROCK

Groundwater

- Sample Exceeds RbCG R-HHL

RbCG = Risk-based Closure Guide (R2)

R-HHL = Residential Groundwater Human Health Level

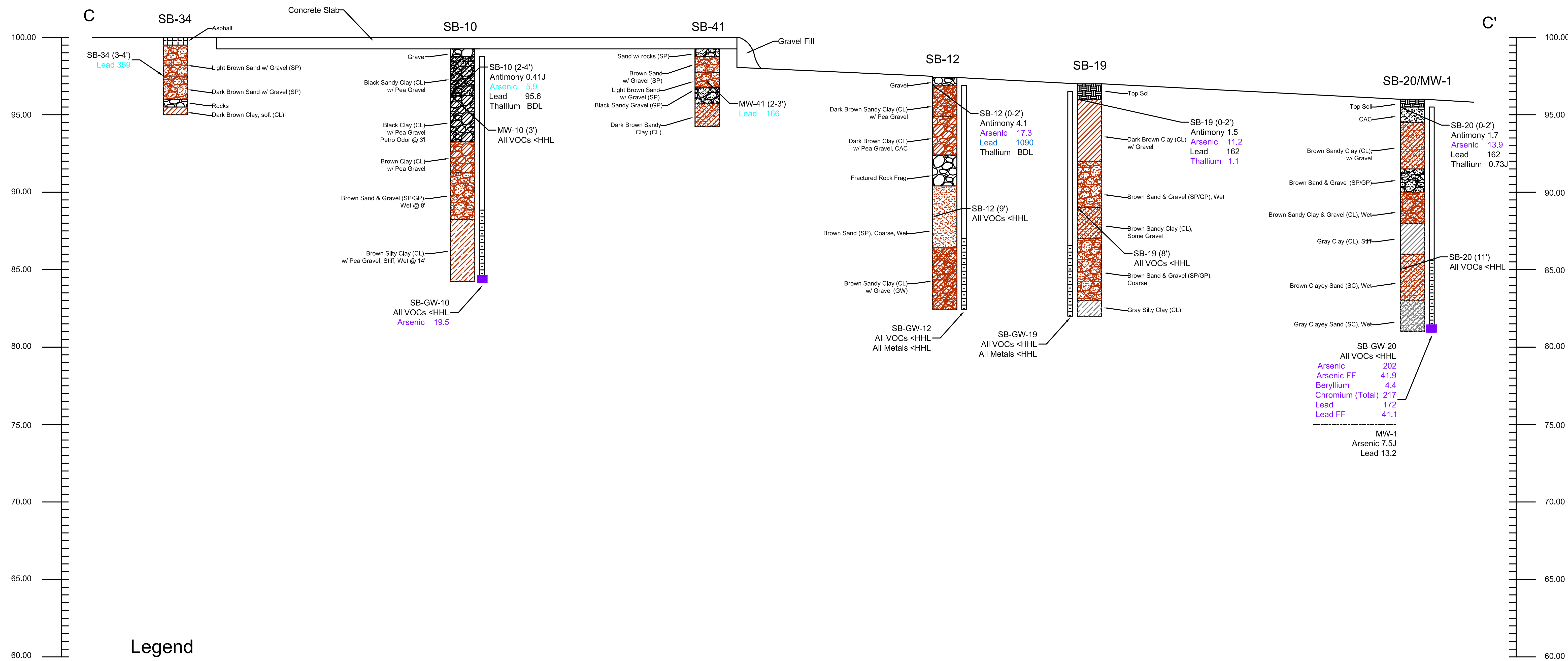
Soil

- Sample Exceeds RbCG Direct Contact HHL
- Sample Exceeds RbCG Comm/Industrial Direct Contact HHL
- Sample Exceeds RbCG Excavation Direct Contact HHL
- Sample Exceeds OLD RCG Migration to GW

RbCG = Risk-based Closure Guide (R2)

RCG = Remediation Closure Guide

BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	VERTICAL EXAGERATION: 8 X	DATE: 6/20/2024 HORIZONTAL SCALE: 1"= 50'	DRAWING TITLE: Geological Cross Section B - B'	PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana	DRAWN BY: dr BCA PROJECT NO: 22-140	FIGURE 6b



Legend

100.00' SURFACE ELEVATION*

100.00' TOC = TOP OF CASING ELEVATION*

- TOPSOIL
- CONCRETE OR ASPHALT
- SAND
- SAND AND GRAVEL
- SILTY CLAY
- CLAY
- BEDROCK

Groundwater

- Sample Exceeds RbCG R-HHL

RbCG = Risk-based Closure Guide (R2)

R-HHL = Residential Groundwater Human Health Level

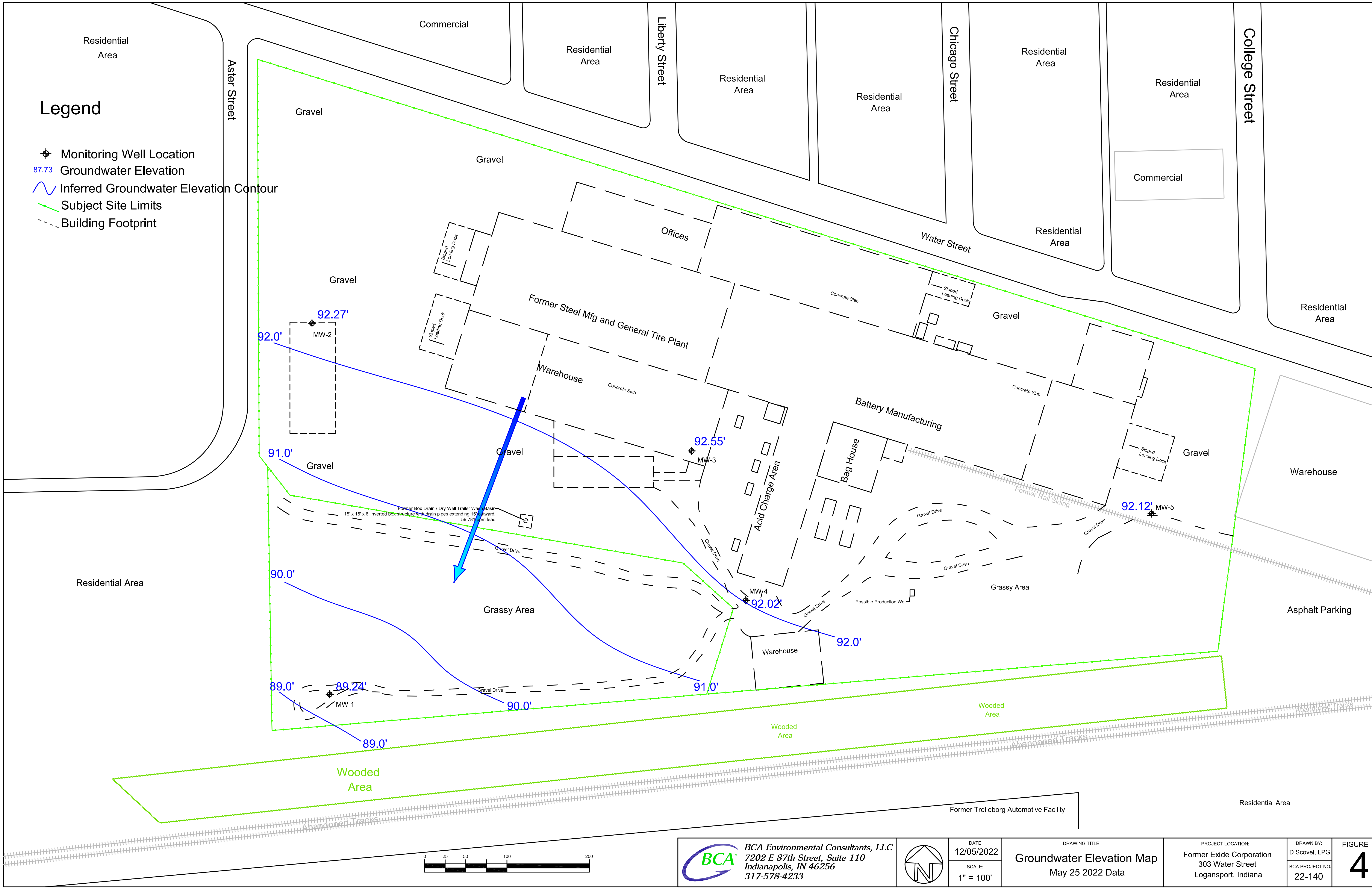
Soil

- Sample Exceeds RbCG Direct Contact HHL
- Sample Exceeds RbCG Comm/Industrial Direct Contact HHL
- Sample Exceeds RbCG Excavation Direct Contact HHL
- Sample Exceeds OLD RCG Migration to GW

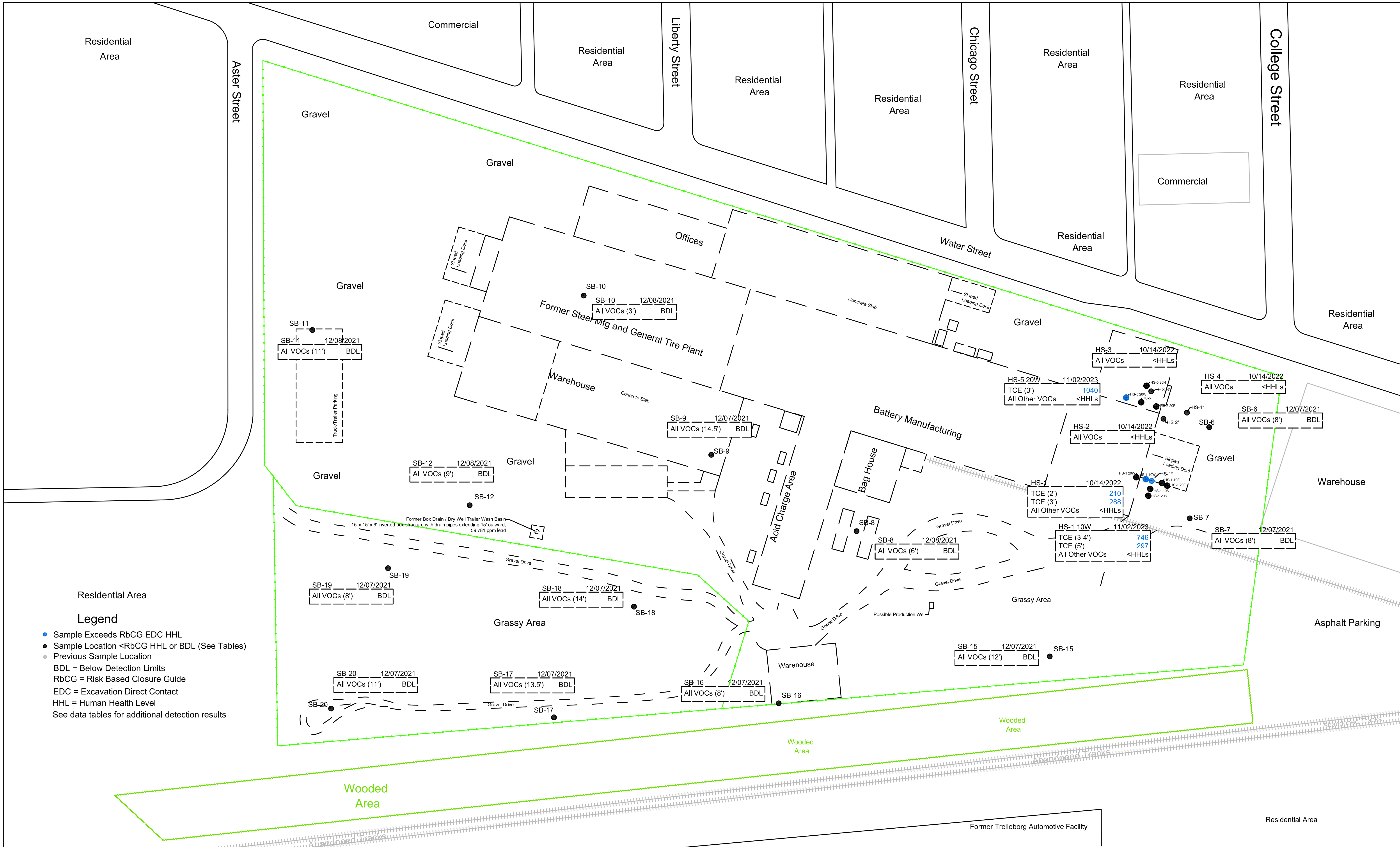
RbCG = Risk-based Closure Guide (R2)

RCG = Remediation Closure Guide

BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	VERTICAL EXAGERATION: 8 X	DATE: 6/20/2024 HORIZONTAL SCALE: 1"= 50'	DRAWING TITLE Geological Cross Section C- C'	PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana	DRAWN BY: dr BCA PROJECT NO. 22-140	FIGURE 6c


Legend
Monitoring Well Location
87.73 Groundwater Elevation
Inferred Groundwater Elevation Contour
Subject Site Limits
Building Footprint
Residential Area
Commercial
Residential Area
Residential Area
Residential Area
Residential Area
Residential Area
Commercial
Residential Area
Residential Area
Aster Street
Liberty Street
Chicago Street
College Street
Water Street
Gravel
Gravel
Gravel
Offices
Sloped Loading Dock
Sloped Loading Dock
Former Steel Mfg and General Tire Plant
Warehouse
Concrete Slab
Concrete Slab
Concrete Slab
Sloped Loading Dock
Gravel
Battery Manufacturing
Bag House
Acid Charge Area
Sloped Loading Dock
Gravel
Warehouse
Former Rail Siding
92.27'
MW-2
92.0'
91.0'
Gravel
Gravel
92.55'
MW-3
92.12'
MW-5
Former Box Drain / Dry Well Trailer Wash Basin
15' x 15' x 6' inverted box structure with drain pipes extending 15' outward.
59,781 ppm lead
Gravel Drive
Gravel Drive
Gravel Drive
Gravel Drive
Gravel Drive
Gravel Drive
Gravel Drive
Residential Area
90.0'
Grassy Area
Grassy Area
MW-4
92.02'
92.0'
Possible Production Well
Warehouse
Asphalt Parking
89.0'
89.24'
MW-1
91.0'
90.0'
89.0'
Wooded Area
Wooded Area
Wooded Area
Abandoned Tracks
Abandoned Tracks
Former Trelleborg Automotive Facility
Residential Area
0 25 50 100 200
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
N
DATE: 12/05/2022
SCALE: 1" = 100'
DRAWING TITLE
Groundwater Elevation Map
May 25 2022 Data
PROJECT LOCATION:
Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY: D Scovel, LPG
BCA PROJECT NO. 22-140
FIGURE 4

BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	DATE: 5/14/2024 SCALE: 1" = 100'	DRAWING TITLE Soil Analytical Results - Lead	PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana	DRAWN BY: dr BCA PROJECT NO. 23-227	FIGURE 5



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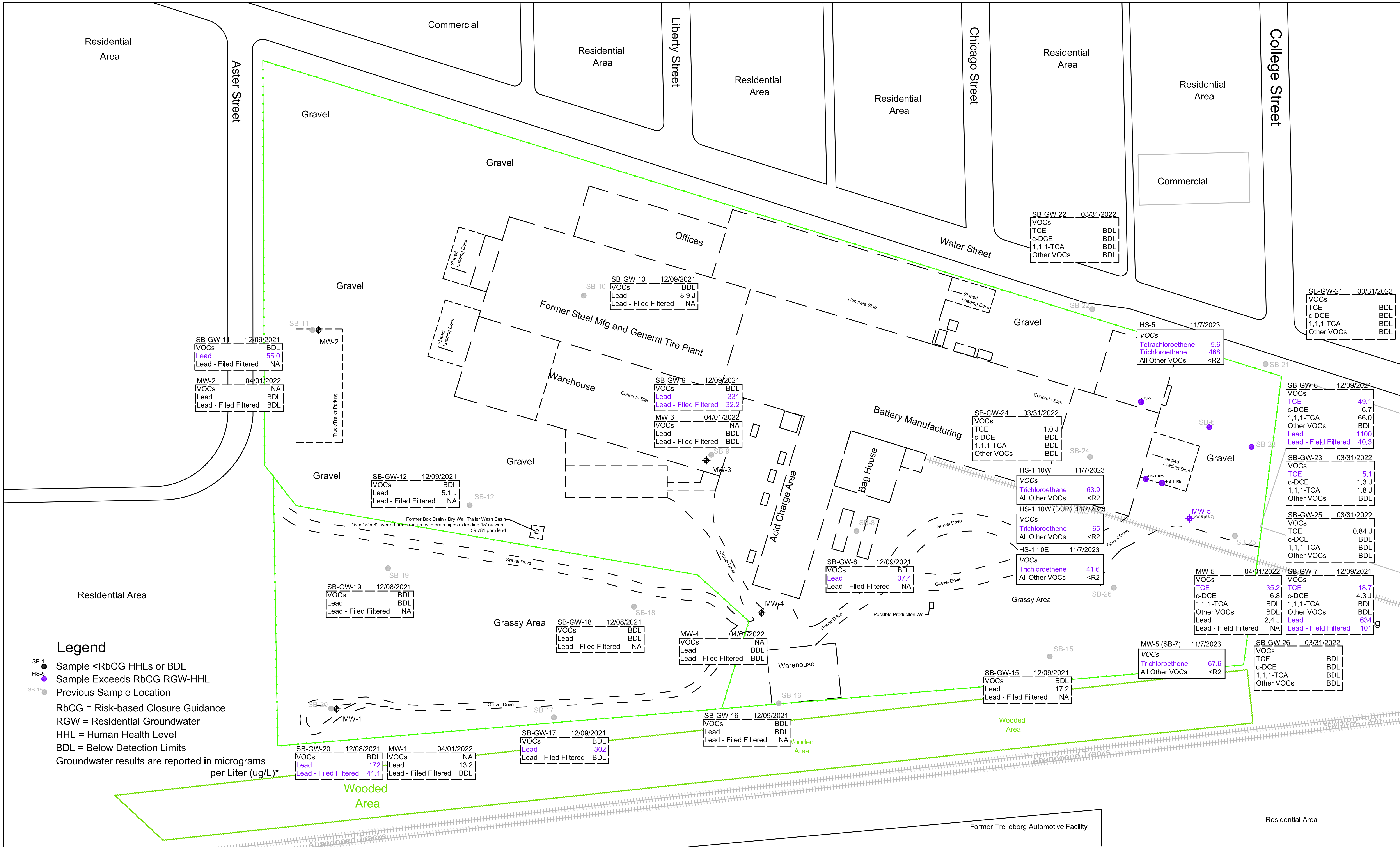
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
5/14/2024	Soil Analytical Results - VOCs	Former Exide Corporation 303 Water Street Logansport, Indiana	dr	6
SCALE: 1" = 100'			BCA PROJECT NO. 23-227	



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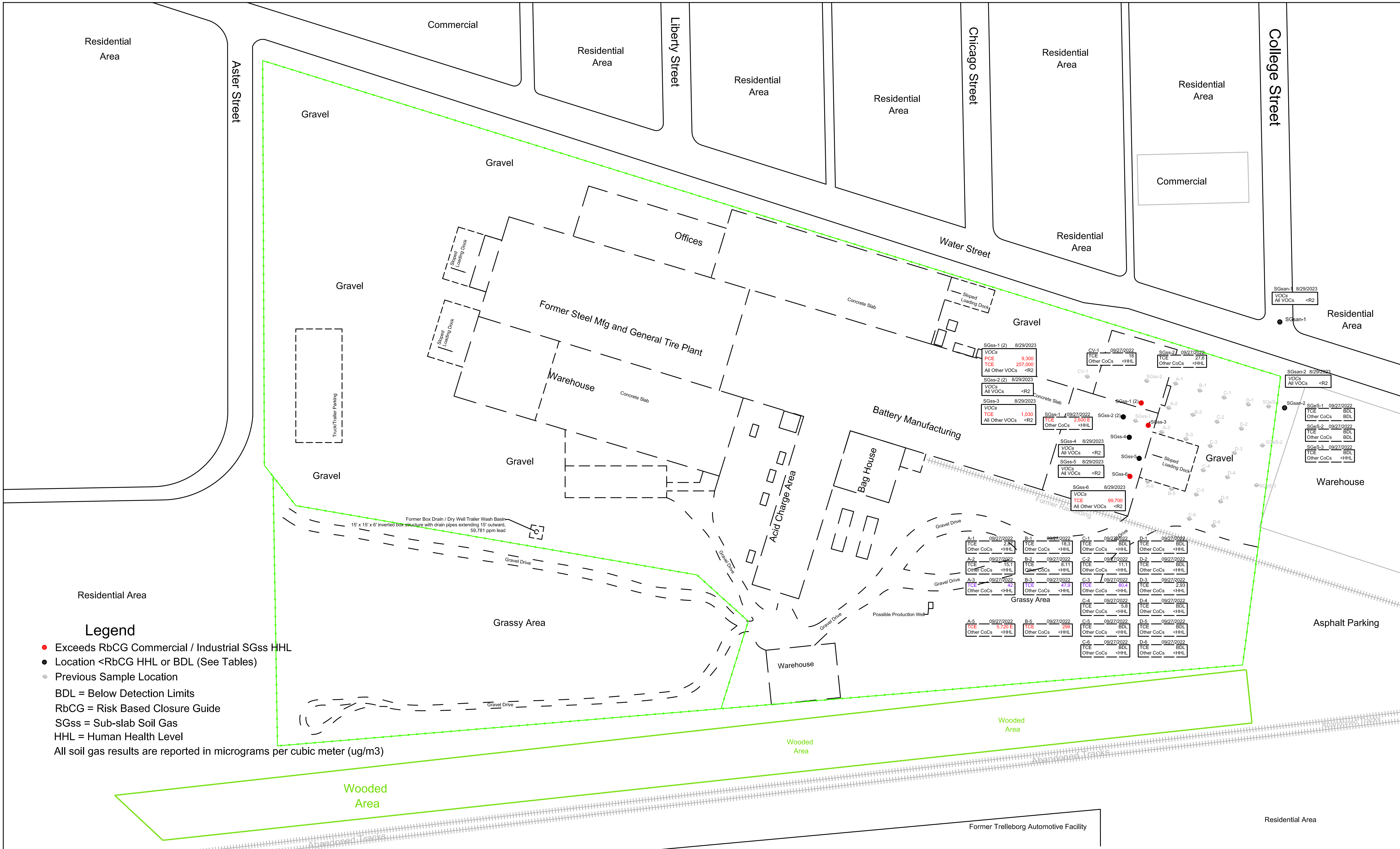
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
5/14/2024	Groundwater Analytical Results VOCs and Lead	Former Exide Corporation 303 Water Street Logansport, Indiana	dr	7
SCALE: 1" = 100'			BCA PROJECT NO. 23-227	



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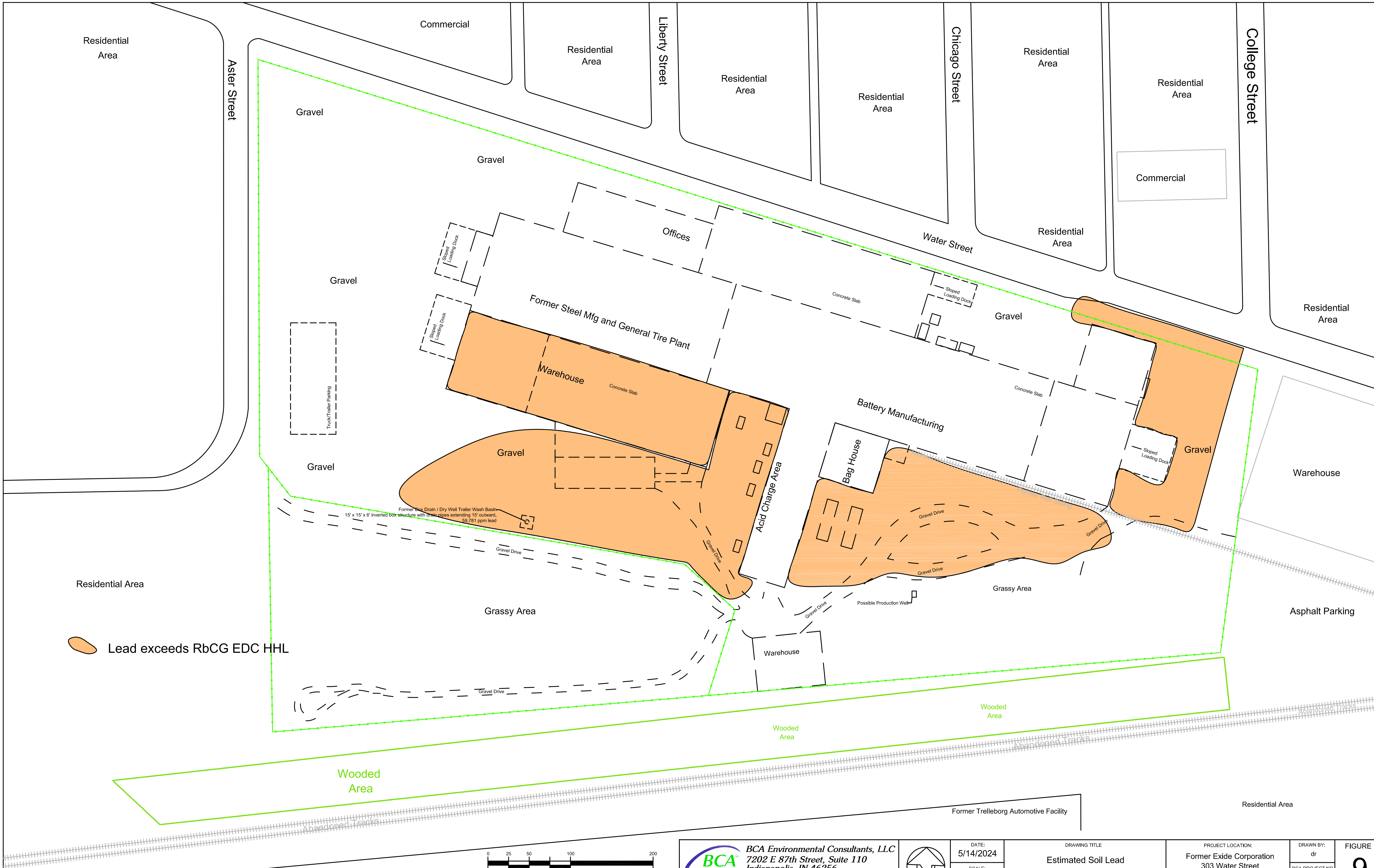
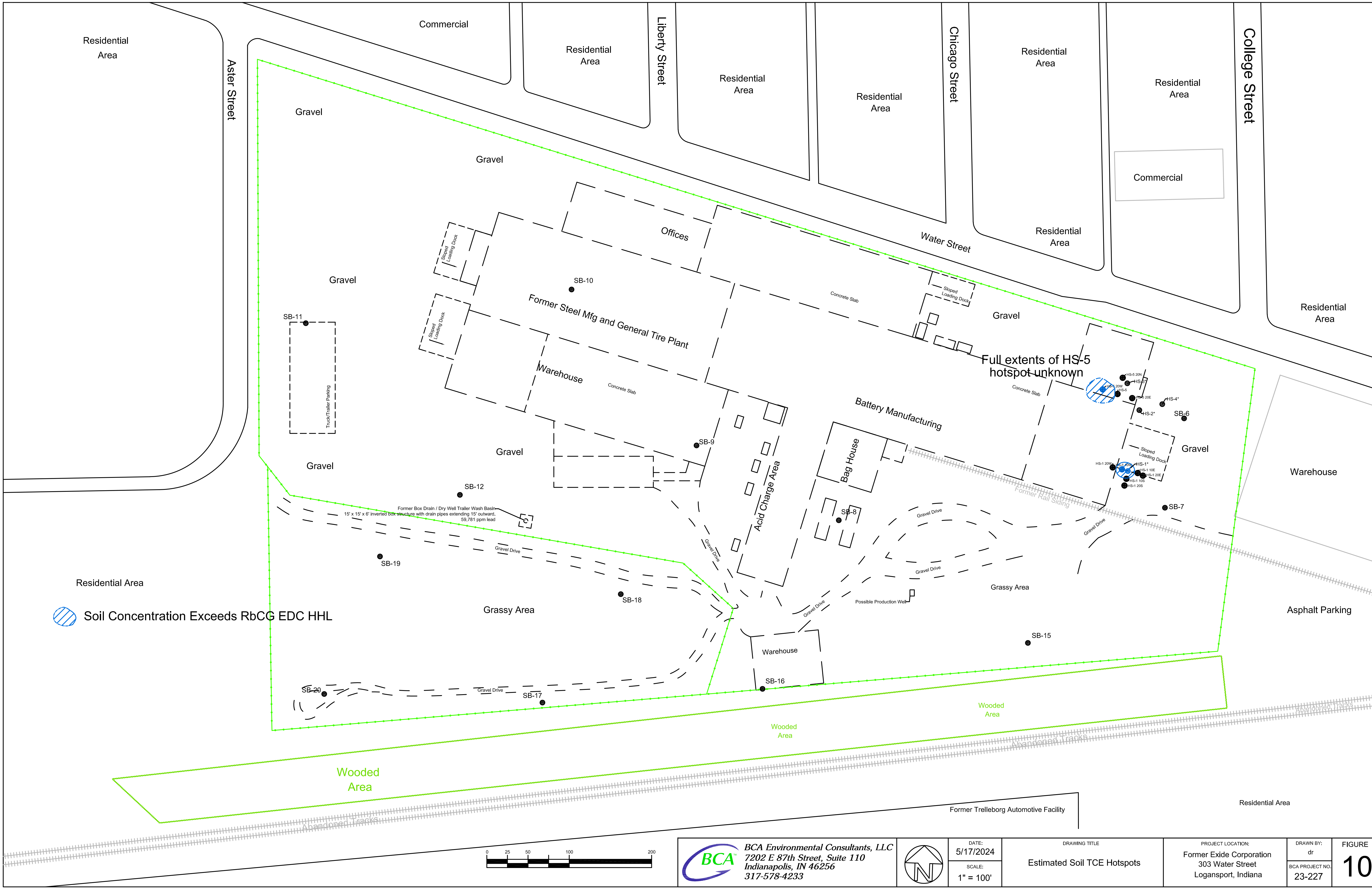
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
5/14/2024	Soil Gas and Vapor Conduit Analytical Results	Former Exide Corporation, 303 Water Street, Logansport, Indiana	dr	8
SCALE: 1" = 100'			BCA PROJECT NO. 23-227	

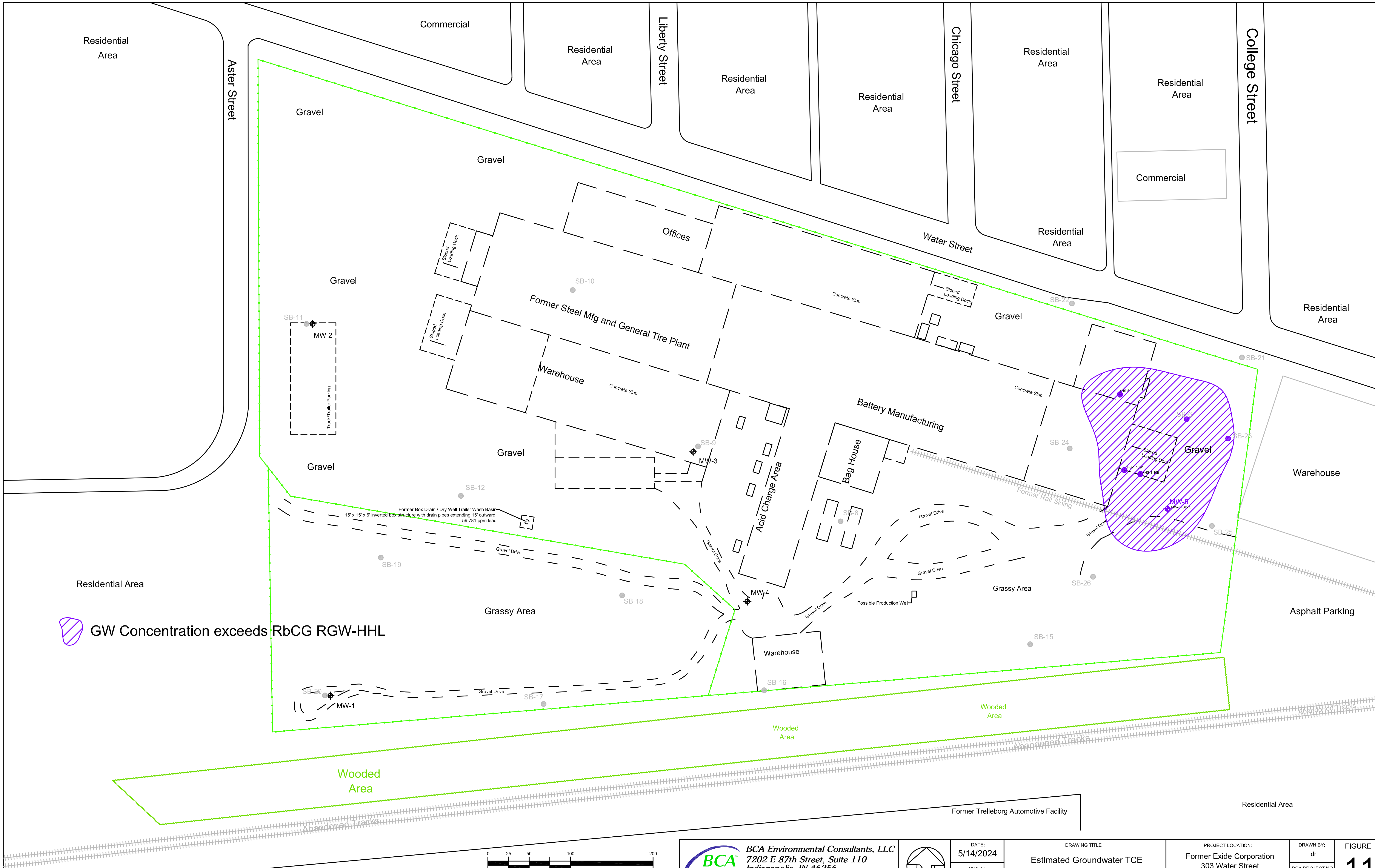


BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
5/14/2024	Estimated Soil Lead extents above 1000 ppm	Former Exide Corporation 303 Water Street Logansport, Indiana	dr	9
SCALE: 1" = 100'			BCA PROJECT NO. 23-227	



Residential Area
Commercial
Residential Area
Liberty Street
Residential Area
Residential Area
Chicago Street
Residential Area
Residential Area
College Street
Commercial
Residential Area
Residential Area
Aster Street
Gravel
Gravel
Offices
Water Street
Sloped Loading Dock
Gravel
SB-10
Former Steel Mfg and General Tire Plant
Concrete Slab
Sloped Loading Dock
Gravel
SB-11
Truck/Trailer Parking
Warehouse
Concrete Slab
Full extents of HS-5 hotspot unknown
Concrete Slab
Battery Manufacturing
HS-4*
HS-2*
SB-6
Gravel
SB-9
Bag House
Acid Charge Area
Sloped Loading Dock
HS-1*
Gravel
Gravel
Warehouse
SB-12
Former Rail Siding
Former Box Drain / Dry Well Trailer Wash Basin
15' x 15' x 6' inverted box structure with drain pipes extending 15' outward.
59,781 ppm lead
SB-8
SB-7
Gravel Drive
Gravel Drive
Gravel Drive
SB-19
Gravel Drive
Gravel Drive
Residential Area
SB-18
Grassy Area
Possible Production Well
Asphalt Parking
Soil Concentration Exceeds RbCG EDC HHL
Grassy Area
Gravel Drive
Warehouse
SB-15
SB-16
SB-20
Gravel Drive
SB-17
Wooded Area
Wooded Area
Wooded Area
Abandoned Tracks
Abandoned Tracks
Abandoned Tracks
Residential Area
Former Trelleborg Automotive Facility
0 25 50 100 200
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
N
DATE: 5/17/2024
SCALE: 1" = 100'
DRAWING TITLE: Estimated Soil TCE Hotspots
PROJECT LOCATION: Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY: dr
BCA PROJECT NO. 23-227
FIGURE 10



BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233

N

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
5/14/2024	Estimated Groundwater TCE Plume	Former Exide Corporation 303 Water Street Logansport, Indiana	dr	11
SCALE: 1" = 100'			BCA PROJECT NO. 23-227	

Appendix A

City Ordinance Chapter 50, Section 50-93, Article g

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

ARTICLE IV. PUBLIC WORKS CONSTRUCTION

Sec. 50-91. Findings; purpose.

It is the desire of the common council to establish policies regarding the construction and/or replacement of public works in the city, including streets, curbs, alleys, walks, streetlights, storm sewers, sanitary sewers, water lines and electrical service, and it is the purpose of this article to set forth such policies.

(Code 1974, § 5-71)

Sec. 50-92. General standard of construction of facilities.

(a) *Definitions.* The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them in this subsection, except where the context clearly indicates a different meaning:

Developers means parties who control property that is intended for development.

Property owners means owners of individual parcels or owners of lots in approved subdivisions.

(b) *Purpose of construction; responsibility for costs.* It is the basic position of the city that public works facilities and improvements (i.e., streets, curbs, alleys, walks, streetlights, storm sewers, sanitary sewers, water lines and electrical service) shall be constructed for the convenience and benefit of the properties that such public works facilities serve. Further, the cost of constructing such public works facilities shall be the primary responsibility of the properties receiving the benefit from such facilities. The facilities shall be constructed in accordance with city specifications.

(c) *Charge required.* It is not the policy of the city to provide such public works facilities for any property or at any location at no cost to the properties receiving the benefit from such facilities.

(Code 1974, § 5-72)

Sec. 50-93. New public works facilities construction policy.

(a) *Streets, curbs and alleys.* It is expected that each property owner and/or developer receiving the service and use of streets, curbs and alleys shall pay on a pro rata share cost basis for the initial improvement or construction of the public works facilities. Once constructed and accepted by the city, the city shall be responsible for routine and periodic maintenance thereof. The city will use, whenever possible, motor vehicle highway, local roads and streets or other funds or taxes for the maintenance and, when appropriate, reconstruction of improved streets, curbs and alleys.

(b) *Sidewalks.* Construction of sidewalks shall be the responsibility of the abutting property owner. Furthermore, all property owners must be responsible for maintenance of the sidewalks. For new land development projects, such as new housing, commercial or industrial subdivisions, the developers shall be responsible for the cost and installation of sidewalks, if required. The city, in its discretion, may elect to participate in the reconstruction of sidewalks in residential areas where funds for such purpose are available and such improvements are deemed by the city to be of benefit to the city in general.

(c) *Electrical service.* It is the responsibility of the Logansport Municipal Utility to extend and install electric service to new development sites or new service areas within its jurisdiction. The Logansport Municipal Utility is responsible for the cost of the installation of such service to the new development or new service areas and for the maintenance of the service lines. The interior installation of electrical service to individual properties or subdivisions is the responsibility of the property owner or developer.

(d) *Streetlights.* The city may provide street lighting as funds permit in a standard streetlighting form. As long as economically feasible, the city shall continue its policy of installing streetlights at no expense to the owner, provided, the owner pays the cost of the fixtures and poles, if any. Such streetlights shall be installed on the city's standard poles, with overhead wiring. If any property owner should desire to have ornamental lighting in lieu of the standard lighting, such property owner shall be required to pay the increased cost of materials.

(e) *Storm sewers.* Storm sewers shall be designed and constructed to serve the watershed area. The cost of storm sewers shall be prorated over the benefited property owners in a manner consistent with Barrett Law or other assessment procedures provided by state statute to the city. The city shall seek federal and state funding, where possible, to assist in such costs. For new land development projects, such as new housing, commercial or industrial subdivisions, the developers shall be responsible for the cost and installation of storm sewers.

(f) *Sanitary sewers.* Sanitary sewers will be available to be extended for the benefit to serve additional properties. The cost shall be prorated to the benefited property owners in a manner consistent with the Barrett Law or other assessment procedures provided by state statute to the city. The city will also seek federal and state funding, where possible, to assist in such costs. For new land development projects, such as new housing, commercial or industrial subdivisions, the developers shall be responsible for the cost and installation of sanitary sewers. All property owners shall be required to hook up to the sanitary sewer system, provided, the appropriate lines are within 300 feet of the property line.

(g) *Water lines.* Water lines shall be available to be extended for the benefit to serve additional properties. The cost shall be prorated to the benefited property owners in a manner consistent with the Barrett Law or other assessment procedures provided by state statute to the city. The city will also seek federal and state funding sources, where possible, to assist in the sharing of such costs. For new land development projects, such as new housing, commercial, or industrial subdivisions, the developers shall be responsible for the cost and installation of water lines. All property owners shall be required to hook up to the water system, provided, the appropriate lines are within 300 feet of the property line. Owners will not be allowed to operate separate wells without approval of the utility service board.

(h)

Miscellaneous. Where the tangible and intangible benefits to the city and/or the Logansport Municipal Utility of the proposed development, determined in the discretion of the common council, board of public works and safety or utility service board, are to be derived from the development, the city and/or Logansport Municipal Utility may bear some or all of the costs of extending utility service to the development.

(Code 1974, § 5-73)

Sec. 50-94. Procedure.

(a) Whenever a property owner or developer should desire the construction of public improvements, he shall first petition the city board of public works and safety. The petition shall clearly state the type of public improvement desired and its location, and shall be signed by the property owners making such request. The procedures outlined in the city's subdivision control ordinance shall also be followed in the case of new development.

(b) Upon receiving the petition, the city board of public works and safety will review existing facilities in the area and prepare a preliminary cost estimate for the public facilities requested, and make a determination of the available funds to assist in any cost sharing of the public improvements. Upon completion of the determination, the city board of public works and safety shall then inform the petitioner and other affected property owners, who will be expected to cost share in the public works aspect of the proposed project and the board's finding, including the estimated cost.

(c) The common council or the board of public works and safety, after consultation with the developer and/or property owner, may determine whether or not to proceed with the project. If the decision is made to proceed with the project, the terms and conditions of the city's participation shall be set forth in writing and signed by the appropriate city official and the developer and/or affected property owners. The city shall then follow the applicable state statutes for the construction of public improvements and complete the project accordingly.

(Code 1974, § 5-74)

Sec. 50-95. Annexation.

(a) Before annexing contiguous territory into the city, an assessment will be made by the board of public works and safety, Logansport Municipal Utility, planning department and street department determining the adequacy and status of the existing physical amenities referred to as "public works." Prior to annexing territory, the city must determine that it has the capacity to maintain existing public works to the standard in which they were received, and the Logansport Municipal Utility must have the capacity to extend water, sewer and electrical services for present and projected future needs. Costs of extending public works within individual properties or subdivisions will be the responsibility of the property owners or developers.

(b) The city will consider construction and/or replacement of public works into individual properties or subdivisions in annexed territory if petitioned as specified in section 50-94

(c) The city and/or Logansport Municipal Utility may, at its discretion, agree to participate financially in the construction and/or replacement of some public works into individual properties or subdivisions in the course of annexation negotiations if it determines such participation is warranted and financially feasible in a fiscal plan.

(Code 1974, § 5-75)

Appendix B

Web Soil Survey Map and Unit Description

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Cass County, Indiana

December 6, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Exide)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cass County, Indiana
Survey Area Data: Version 27, Sep 3, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 16, 2022—Jun 21, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Exide)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gg	Gilford loam, gravelly substratum, 0 to 2 percent slopes	16.6	100.0%
Totals for Area of Interest		**16.6**	**100.0%**

Map Unit Descriptions (Exide)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cass County, Indiana

Gg—Gilford loam, gravelly substratum, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30kbp
Elevation: 360 to 900 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Gilford and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilford

Setting

Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Bg1 - 11 to 43 inches: fine sandy loam
Bg2 - 43 to 54 inches: loamy sand
2Cg - 54 to 79 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R111XC002IN - Wet Sandy Interdune
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: Yes

Minor Components

Rensselaer

Percent of map unit: 8 percent
Landform: Depressions
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XC008IN - Wet Overflow, R111XB401IN - Wet Outwash Mollisol
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: Yes

Ormas

Percent of map unit: 5 percent
Landform: Outwash terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R111XC001IN - Sand Dune
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Morocco

Percent of map unit: 3 percent
Landform: Drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F095XA005WI - Moist Sandy Lowland
Other vegetative classification: Low AWC, adequately drained (G095AY002WI)
Hydric soil rating: No

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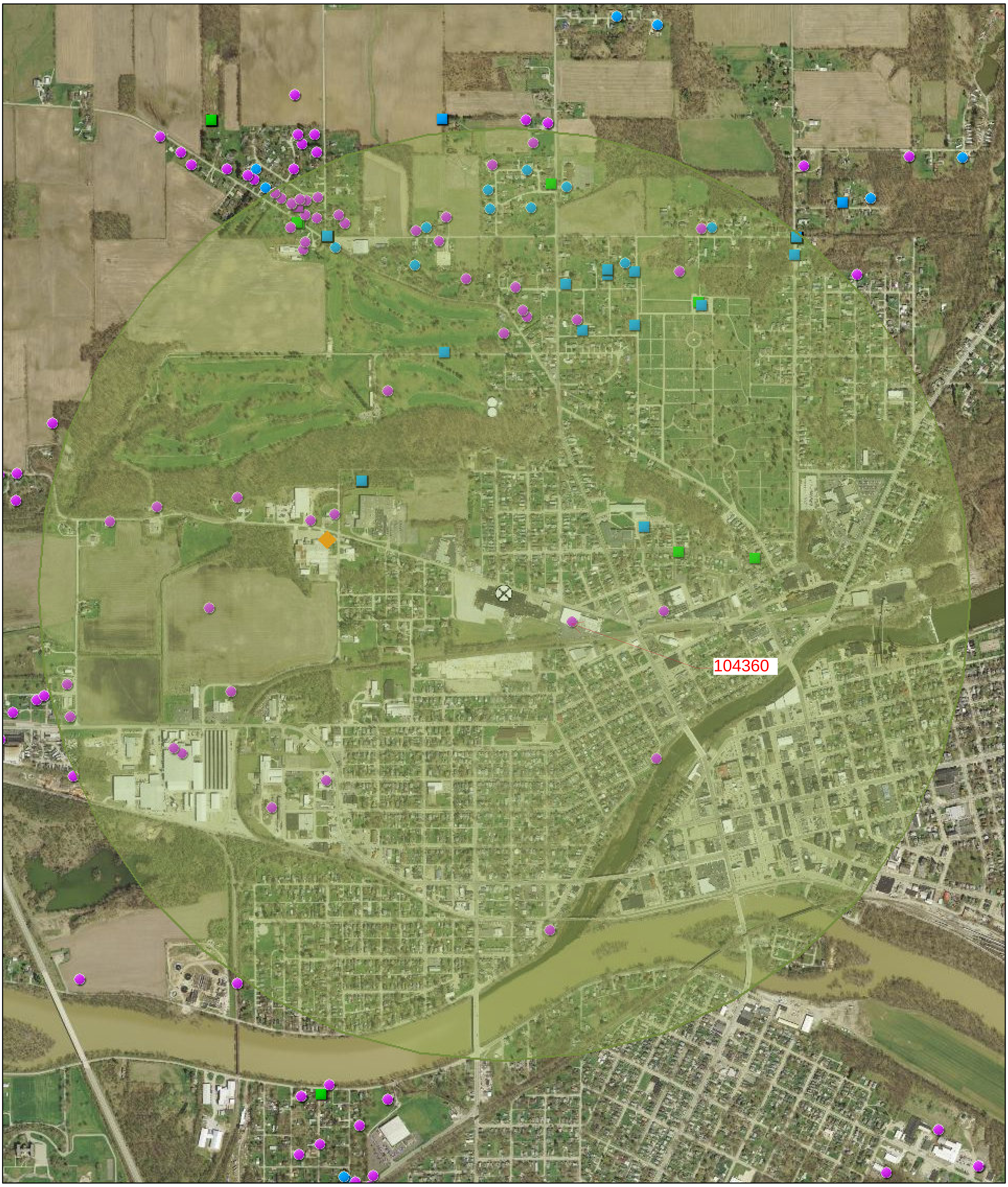
Appendix C

Water Well Record Search

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

Indiana DNR Water Well Viewer



11/18/2022, 2:49:56 PM

1:18,056

0 0.2 0.4 0.8 mi

0 0.325 0.65 1.3 km

Buffer Polygon

Boreholes Drilled to Bedrock

Other

Field Located

Unconsolidated Wells

Other

Field Located

Unspecified Well Type

Other

Significant Withdraw Wells

Red: Band_1

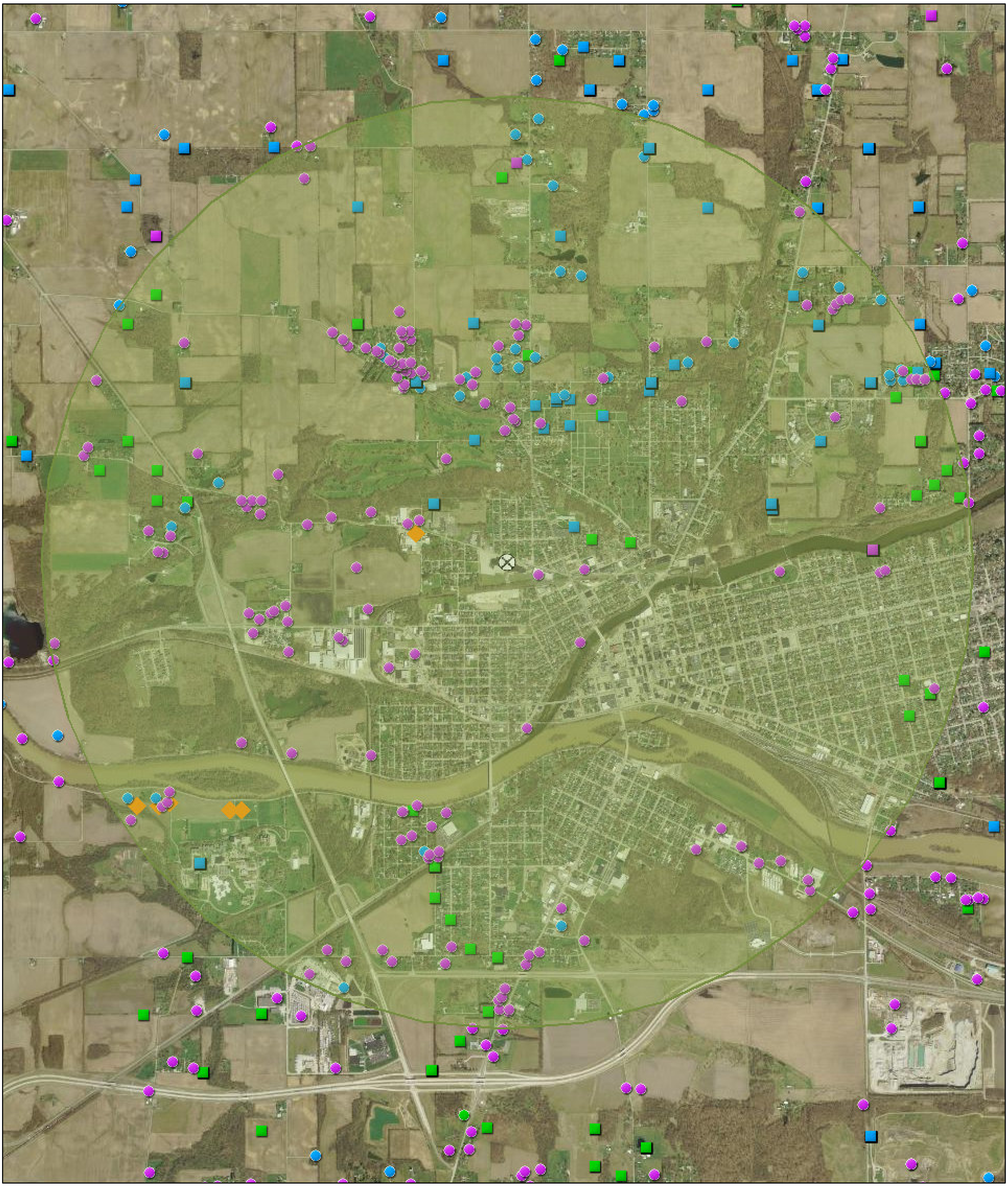
Green: Band_2

Blue: Band_3

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

InDNRMaps
IN Dept. of Natural Resources 2018

Indiana DNR Water Well Viewer



11/18/2022, 3:04:55 PM

Buffer Polygon

Blue: Band_3

Boreholes Drilled to Bedrock

Other

Field Located

Unconsolidated Wells

Other

Field Located

Unspecified Well Type

Other

Field Located

Significant Withdraw Wells

Red: Band_1

Green: Band_2

1:36,112

0 0.4 0.8 1.6 mi

0 0.5 1 2 km

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

InDNRMaps
IN Dept. of Natural Resources 2018

Record of Water Well

Indiana Department of Natural Resources

Reference Number 104360

Driving directions to well NW PART OF LGSPT

Date completed Apr 15, 1960

Owner-Contractor	Name	Address	Telephone
Owner	THE ELECTRIC STORAGE BATTERY	301 WATER ST LGSPT	
Driller	J B ORTMAN & SONS	R 1 KOKOMO	
Operator	H P AMOS	License: null	

Construction Details

Well	**Use:** Industry	**Drilling method:** Cable Tool	**Pump type:**
	Depth: 205.0	**Pump setting depth:**	**Water quality:**
Casing	**Length:** 31.0	**Material:**	**Diameter:** 8.0
Screen	**Length:**	**Material:**	**Diameter: Slot size:** ROCKWELL

Well Capacity Test
Type of test: **Test rate:** 198.0 gpm for 27.0 hrs. **BailTest rate:** gpm for hrs.
Drawdown: 36.0 ft. **Static water level:** 9.0 ft. **Bailer Drawdown** ft.

Grouting Information
Material: **Depth:** from to
Installation Method: **Number of bags used:**

Well Abandonment
Sealing material: **Depth:** from to
Installation Method: **Number of bags used:**

Administrative
County: CASS **Township:** 27N **Range:** 1E
Section: NW of the SW of the NW of Section 25 **Topo map:** LOGANSPORT
Grant Number:
Field located by: SS **on:** Jul 20, 1961
Courthouse location by: **on:**
Location accepted w/o verification by: **on:**
Subdivision name: **Lot number:**
Ft W of EL: 5000.0 **Ft N of SL:** **Ft E of WL:** **Ft S of NL:** 1750.0
Ground elevation: 601.0 **Depth to bedrock:** 7.0 **Bedrock elevation:** 594.0 **Aquifer elevation:**
UTM Easting: 552899.0 **UTM Northing:** 4512071.0

Well Log

Top	Bottom	Formation
0.0	7.0	FILL
7.0	14.0	DRIFT AND BOULDERS
14.0	23.0	GRAV & SAND
23.0	27.0	CHIRT & BROKEN STONE
27.0	31.0	SAND
31.0	205.0	SOLID LS

Comments

Appendix D

Monitoring Well and Soil Boring Logs

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

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Indianapolis, IN 46256

BORING LOG

Borehole ID: SB-1
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947		
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 10'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	
Date Drilling Started/Completed	12/7/2020	12/7/2020	
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552498.214 Northing 4512447.76

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel/Asphalt	60%	0.0	89 77 81	Metals, PAHs @ 0-1'
		Brn Sandy Clay (CL) w/ Pea Gravel (GP)		0.0	<22 42 21 <34 <15 89 <13	
5		Brn Clay (CL) w/ Some Pea Gravel (GP), Wet	40%	0.0	<19 76	
		Brn Gravel & Sand (SP-GP), Some Rock Frag., Wet		0.0	35 32 24	
10		**BTH 10'** Hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-2
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	20-280	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
LT	Cody Wheat		10'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	2.5"	12/7/2020	12/7/2020

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Schipp	D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552580.455 Northing 4512425.878

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel/Asphalt			76 145	
		Brn Sand & Gravel (SP-GP), Coarse, Pea		0.0	43 117	Metals, PAHs @ 0-1'
		Brn Sandy Clay (CL) w/ Pea Gravel (GP)	50%		173 12	
		Rock Frag./Pea Gravel			55	
5		Brn Clay (CL) w/ Large Gravel (GP), Moist		0.0	46 53 27 <9	
		Brn Sandy Clay (CL), Some Pea Gravel (GP)	50%	0.0 0.0	<12 <16 <15 11	
10		**BTH 10'** Hole backfilled with granular bentonite.				
15						
20						
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BORING LOG

Borehole ID: SB-3
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947			
Project Name Former Exide Corporation		**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT		**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 10'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** N/A	
			Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552647.895 — Northing 4512398.759

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	40%	0.0	1166 835 309	Metals, PAHs @ 0-1'
		Drk Brn Sandy Clay (CL), Some Gravel (GP), CAC @ 4-5'		0.0	77 145 142 53 85 127 31	
5		Brn Sandy Clay (CL) w/ Large Gravel (GP)	40%	0.0	248 76 17	
		Sand & Gravel (SP-GP)		0.0	<11	
		Crushed Rock Frag. (Granite)			<9	
10		**BTH 10'** Hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-4
Sheet 1 of 1

Location	303 Water Street, Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	20-280	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
LT	Cody Wheat		10'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	2.5"	12/7/2020	12/7/2020

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Schipp	D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552717.664 Northing 4512383.283

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Asphalt	40%		<29	
					68	
		Brn Sandy Clay (CL) w/ Gravel (GP)		0.0	109	
					60	
					54	
					153	
					218	Metals, PAHs @ 3-4'
				0.0	21	
		Blk Sandy Clay (CL) w/ Gravel (GP)			108	
5					126	
		Brn Sandy Clay (CL) w/ Gravel (GP)	50%		211	
		Brn Sand & Gravel (SP-GW), w/ Rock Frag., Wet		0.0	<15	
					<11	
				0.0	16	
					103	
10		**BTH 10'**				
		Hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-5
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947			
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947		
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 10'	
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A		
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021	

Location Description (include sketch in field logbook)
Easting 552811.821 Northing 4512352.802

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	40%	0.0	1486 374 89	Metals, PAHs @ 0-1'
		Drk Brn Sand & Gravel (SP-GP), CAC, Wet			19 166 69	
		Drk Brn Clay (CL)		0.0	43 <12	
		Brn Sandy Clay (CL)			<13 <13	
5		Brn Clay (CL), Mod. Stiff	60%	0.0	81 35	
		Lght Brn Sand & Gravel (SP-GW) w/ Rock Frag.		0.0	17 <16 23	
10		**BTH 10'** Hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-6
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 14'

Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** 9.20'	
			Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552836.748 Northing 4512324.696

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	70%		1087	
		Gry Sandy Clay (CL) w/ Large Gravel (GP)		0.0	510 325	
		Brn Sandy Clay (CL) w/ CAC, Gravel (GP)			451 178	Metals, PAHs @ 0-2'
		Brn Clay (CL) w/ Some Large Gravel (GP)		0.0	63 17 72 21 318	
5			80%	0.0	29 <2	
		Brn Sandy Clay (CL) w/ Some Gravel (GP), Wet @ 9'		0.0	<18 <16 <25	VOCs @ 8'
10		Brn Sand & Gravel (SP-GP), Coarse, Wet	90%	0.0		
		Fractured Rock, Wet		0.0		
		BTH 14' Temporary well casing (1" ID w/ 10' screen) set at 14 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-7
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947		
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 13.5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020 / 12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 9.64'	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552826.64 Northing 4512289.688

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	60%		1528	
		Drk Brn Sandy Clay (CL) w/ CAC, Large Gravel (GP)		0.0	389 65 18	Metals, PAHs @ 0-2'
		Brn Clay (CL) w/ Gravel (GP), Large, Rounded		0.0	<9 26 16 29	
5		Drk Brn Sandy Clay (CL), Mod. Stiff			<13 <12	
		Lght Brn Sandy Clay (CL), Mod. Stiff	60%	0.0	58 <11	
		Lght Brn Sand (SP), Fine, Wet		0.0	35 <10	VOCs @ 8'
10		Lght Brn Sand & Gravel (SW-GW), Fine-Coarse w/ Depth	40%	0.0	12	
15		**BTH 13.5'** Temporary well casing (1" ID w/ 10' screen) set at 13.5 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						

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BORING LOG

Borehole ID: SB-8
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947			
Project Name Former Exide Corporation	**Project Number** 20-280		**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat		**Ground Elevation**	**Total Drilled Depth** 15'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/8/2020	12/8/2020
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** 6.63'	
			Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021
Location Description (include sketch in field logbook)				
Easting 552704.451			Northing 4512283.379	

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	40%		72	
		Sand & Gravel Fill Material (SP-GP)		0.0	196 1044	
		Brn Sandy Clay (CL) w/ Some Small Gravel (GP)		0.0	1337 361 114 <15 <15 <21 <20	Metals, PAHs @ 0-2'
5		Brn Sand and Gravel (SP-GP), Coarse, Pea, Wet	60%	0.0 0.0	79 27 42 18 <14	VOCs(+DUP) @ 6'
10		Brn Sand (SP), Coarse, Wet	90%	0.0		
		Brn Sand and Gravel (SP-GP), Coarse, Pea, Wet		0.0		
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						

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BORING LOG

Borehole ID: SB-9
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 20'

Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** 8.60'	
			Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552652.019 Northing 4512309.051

Depth	Description	Recovery	PID ppm	XRF	Remarks
0	Concrete	60%		21 106	
	Brn Sandy Clay (CL), Coarse, Some Gravel (GP)		0.0	1281 259 2.14% 1.1%	PAHs @ 0-2'
	Blk Sandy Clay (CL), Fine, Some Gravel (GP), CAC		0.0	245 244 226 155	Metals @ 2-4'
5	Bn Sandy Clay (CL), Mod. Stiff	50%	0.0 0.0	715 <11 <14 <15 <22	
10	Gry Sand & Gravel (SP-GP), Rock Frag.	90%	0.0		VOCs @ 14.5'
	Gry Sandy Clay (CL) w/ Gravel (GP), Wet		0.0		
15	Gry Sand & Gravel (SP-GP), Coase Sand, Increased Gravel Size w/ Depth	70%	0.0 0.0		
20	**BTH 20'** Temporary well casing (1" ID w/ 10' screen) set at 20 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
25					

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BORING LOG

Borehole ID: SB-10
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name Former Exide Corporation		**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947		
Drilling Company LT		**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'	
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/8/2020	12/8/2020	
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** 9.06'		
			Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021	
Location Description (include sketch in field logbook) Easting 552609.751			Northing 4512366.434		

Depth	Description	Recovery	PID ppm	XRF	Remarks
0	Gravel	80%		14	
	Blk Sandy Clay (CL) w/ <Pea Gravel (GP)		0.0	30, 60, 84, 463	Metals, PAHs @ 2-4'
	Blk Clay (CL) w/ <Pea Gravel (GP), Petro. Odor @ 3'		0.0	61, 105, 78, 14, 16	VOCs @ 3'
5	Brn Clay (CL) w/ <Pea Gravel (GP)	60%	0.0	46, <13	
	Brn Sand and Gravel (SP-GP), Large Gravel, Fractured Rock Layer @ 8', Wet		0.0	<16, <20, 19	
10	Brn Silty Clay (CL) w/ <Pea Gravel (GP), Stiff, Wet @ 14'	100%	0.0, 0.0		
15	**BTH 15'**				
	Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20					
25					

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BORING LOG

Borehole ID: SB-11
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	20-280	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
LT	Cody Wheat		15'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	2.5"	12/8/2020	12/8/2020

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	8.60'	
	Logged By:	**Checked by/Date**
	C. Schipp	D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552515.958 Northing 4512349.023

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel	90%		100	
		Drk Brn Silty Sand (SM), Some Pea Gravel (GP)		0.0	92, 68, 51	Metals, PAHs @ 0-2'
		Brn Sandy Clay (CL), Few Pea Gravels (GP)		0.0	<11, 14, 19, 16, <12, 18	
5		Fractured Rock Frag., Brn Sand & Gravel (SP-GP), Wet @ 9'	50%	0.0	22, 30	
				0.0	18, <19, 13	
10		Brn Sand & Gravel (SP-GP), Coarse, Increased Sand & Gravel Size w/ Depth, Wet	90%	0.0		VOCs @ 11'
		Brn Sandy Clay (CL), Stiff, Wet		0.0		
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						

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BORING LOG

Borehole ID: SB-12
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'
Drilling Equip Geoprobe / **Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/8/2020	12/8/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 6.70'	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552566.148 Northing 4512290.309

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel			719	
		Drk Brn Sandy Clay (CL) w/ <Pea Gravel (GP)		0.0	766 286 219	Metals, PAHs @ 0-2'
		Drk Brn Clay (CL) w/ Some <Pea Gravel (GP), CAC	50%	0.0	89 40 <15 <22 28 17	
5		Fractured Rock Frag.		0.0	<21 <16	
		Brn Sand (SP), Coarse, Wet	20%	0.0	<20 <15 <13	VOCs @ 9'
10		Brn Sandy Clay (CL) w/ Gravel (GW), Rounded, Wet	80%	0.0 0.0		
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						

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BORING LOG

Borehole ID: SB-13
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	20-280	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
LT	Cody Wheat		10'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	2.5"	12/7/2020	12/7/2020

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Schipp	D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552655.368 Northing 4512271.091

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	60%	0.0	1864	
					721	
		Brn Sand & Gravel (SP-GP)			573	Metals, PAHs @ 1-2'
					35	
					15	
		Brn Clay (CL), Stiff, Some Large Gravel (GP)			<12	
				0.0	12	
					14	
					12	
5					45	
			40%		23	
		Brn Sandy Clay & Gravel (CL-GP), Wet		0.0	75	
					<14	
		Gravel (GP) & Rock Frag., Wet		0.0	41	
10					175	
		BTH 10'				
		Hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-14
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 10'
Drilling Equip Geoprobe	**Drilling Method** Direct Push / **Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552670.432 Northing 4512257.96

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	80%	0.0	885	
					681	
					990	Metals, PAHs @ 1-2'
		Brn Sandy Clay (CL) w/ Pea Gravel (GP)			161	
					54	
					22	
		Brn Clay (CL) w/ Pea Gravel (GP)			14	
				0.0	<12	
					<10	
5					14	
			70%	0.0	465	
					14	
		Lght Brn Sandy Clay (CL)			11	
		Sand & Gravel (SP-GP), Rock Frag., Wet @ 9-10'		0.0	14	
10					<10	
		BTH 10'				
		Hole backfilled with granular bentonite.				
15						
20						
25						

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BORING LOG

Borehole ID: SB-15
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	20-280	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
LT	Cody Wheat		13.5'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	2.5"	12/7/2020	12/7/2020

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	11.23'	
	Logged By:	**Checked by/Date**
	C. Schipp	D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552765.606 Northing 4512238.228

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	70%	0.0	1107 320	
		Blk Sandy Clay (CL) w/ CAC			175 172 71 77	Metals, PAHs, Herbicides @ 0-2'
		CAC		0.0	29	
5		Drk Brn Clay (CL), Mod. Stiff			72 <14 72	
		Brn Clay (CL), Mod. Stiff	30%	0.0 0.0	29 118 19 <14	
10		Pulverized Rock Frag. w/ Brn Sand (SP)			<10	
		Brn Clay (CL), Mod. Stiff w/ Pea Gravel (GP)	50%	0.0		VOCs @ 12'
		Pulverized Rock Frag. w/ Brn Sand (SP)				
		BTH 13.5' Temporary well casing (1" ID w/ 10' screen) set at 13.5 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
15						
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BORING LOG

Borehole ID: SB-16
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15.5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push / **Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 6.90'	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552681.627 Northing 4512214.637

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Brn Sand (SP), Coarse, Some Gravel (GP)	50%	0.0	25, 57, 41, 33, 40, 43	Metals, PAHs, Herbicides @ 0-2'
		Drk Brn Clay (CL), Some Large Gravel (GP)		0.0	44, <18, 18, 16	
5		Brn Silty Clay (CL), Mod. Stiff	60%	0.0	20, 60	
		Gry Silt (ML)			<10	VOCs @ 8'
		Brn Sand & Gravel (SP-GP), Wet		0.0	54, <12	
10		Brn Sandy Clay (CL) w/ Large Gravel (GP)	20%	0.0, 0.0		0-5' Offset to S 5', Rock in Shoe
15		**BTH 15.5'**				
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Temporary well casing (1" ID w/ 10' screen) set at 15.5 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.

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BORING LOG

Borehole ID: SB-17
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947			
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947		
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'	
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 5.15'		
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021	

Location Description (include sketch in field logbook)
Easting 552587.944 Northing 4512221.288

Depth	Description	Recovery	PID ppm	XRF	Remarks
0	Top Soil	10%		424	
				241	
	CAC		0.0		
				15	Metals, PAHs, Herbicides @ 0-2'
	Brn Sand & Gravel (SP-GP), Large			17	
			0.0	65	
				105	
5		60%		<18	
			0.0	<11	
				12	
	Gry Silty Clay (CL), Stiff		0.0	15	
				16	
10	Gravel (GW), Pea-0.5", Rounded	90%			
	Brn Clay (CL), Stiff, Wet		0.0		VOCs @ 13.5'
			0.0		
15	**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20					
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BORING LOG

Borehole ID: SB-18
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947		
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020 / 12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 6.28'	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552623.898 Northing 4512252.056

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	70%	0.0	380 <19	Metals, PAHs @ 0-2'
		CAC			238	
		Drk Brn Clay (CL), Mod. Stiff		0.0	196 25 <15 15 <10 <14	
5		Brn Sand & Gravel (SP-GW), Increased Gravel Size w/ Depth, Wet @ 7'	10%	0.0 0.0	<18 <11	
10		Brn Sand & Gravel (SP-GW), Coarse Sand, <Pea-0.5" Gravel	90%	0.0		
		Gry Sandy Clay (CL) w/ Gravel (GP)		0.0		VOCs @ 14'
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
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BORING LOG

Borehole ID: SB-19
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	20-280	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
LT	Cody Wheat		15'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	2.5"	12/7/2020	12/7/2020

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	5.52'	
	Logged By:	**Checked by/Date**
	C. Schipp	D.Rust - 3/3/2021

Location Description (include sketch in field logbook)

Easting 552526.704 Northing 4512272.543

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	50%	0.0	341 367	
		Drk Brn Clay (CL) w/ Gravel (GP)		0.0	237 35 <20 16 11 16 13 13	Metals, PAHs (+DUP) @ 0-2'
5		Brn Sand & Gravel (SP-GW), Wet	50%	0.0	<13 <9 <15	VOCs @ 8'
		Brn Sandy Clay (CL), Some Gravel (GW)		0.0	<10 13	
10		Brn Sand & Gravel (SP-GW), Coarse	100%	0.0 0.0		
		Gry Silty Clay (CL)				
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
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BORING LOG

Borehole ID: SB-20
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'

Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** 7.21'	
			Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021

Location Description (include sketch in field logbook)
Easting 552515.574 Northing 4512223.501

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	70%		130	
		CAC			169	
				0.0	78	
		Brn Sandy Clay (CL) w/ Gravel (GP)			17	Metals, PAHs, Herbicides (+MS/MSD) @ 0-2'
					22	
					<15	
					<10	
				0.0	<13	2" Interval of Rock Frag. @ 3'
					<12	
					24	
5		Brn Sand & Gravel (SP-GP)	80%		15	
		Brn Sandy Clay & Gravel (CL-GP), Wet		0.0	20	
					<13	
		Gry Clay (CL), Stiff		0.0	13	
					11	
10		Brn Clayey Sand (SC), Wet	100%	0.0		VOCs (+MS/MSD) @ 11'
		Gry Clayey Sand (SC), Wet, Increased Grain Size w/ Depth		0.0		
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
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BORING LOG

Borehole ID: SB-21
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947
Project Name Former Exide Corporation	**Project Number** 22-104
Site Address	303 Water Street, Logansport, IN 46947
Drilling Company Seratech	**Driller** Sean Hall
Ground Elevation	
Total Drilled Depth	11.5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push
Borehole Dia	1"
Date Drilling Started/Completed	3/30/2022 / 3/31/2022
Type of Sampling Device	5' Acetate Sleeve
Water Level (bgs)	8.7
Logged By:	C. Jones
Checked by/Date	D. Scovel

Location Description (include sketch in field logbook)

Easting 552857.062 Northing 4512339.219

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Black Organics (Pt)	50%		777	
		Grey Sand w/ gravel (SP)			64	Lead @ 0.5-1
		Black Sand w/ gravel (SP)		0.0	283	
					91	
					136	
					51	
		Dark Brown Clay, soft (CL)			14	
				0.0	13	
		Light Brown Sandy Clay, soft (CL)			11	
5					8	
		Dark Brown Clay. Soft, wet (CL)	30%		ND	
		Dark Brown Clay, soft, wet (CL)		0.0	8	
		Wet Limestone			NA	
					NA	
10				0.0	NA	
			10%		NA	

BTH 11.5'

Refusal @ 11.5'

Temporary well casing (1" ID w/ 5' screen) set at 11.5 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.

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BORING LOG

Borehole ID: SB-22
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104		**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall		**Ground Elevation**	**Total Drilled Depth** 15'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022	3/31/2022
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** 8.8	
			Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)
Easting 552790.356 Northing 4512361.462

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Black Sandy Clay (CL)	50%		86 102 49	
		SAA 0-1.5, wet, soft			55 446 119 90 64 7 10	Lead @ 2-2.5
5		Grey Clay, soft, wet (CL)	45%		NA	
		Limestone Rocks			8 NA NA NA	
10		Brown Silty Sand w/ rocks (SM)	60%		NA	
		Grey Silty Sand, wet w/ rocks (SM)			NA NA NA NA	
15		**BTH 15'** Temporary well casing (1" ID w/ 5' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
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BORING LOG

Borehole ID: SB-23
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		12'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	9.2	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)

Easting 552859.483 Northing 4512318.043

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Brown Organics (Pt)	55%		777	Lead @ 0-0.5
		Greyish Sand w/ gravel (SP)			64	
		Black Sand w/ gravel (SP)		0.0	283	
					91	
					136	
					51	
					14	
				0.0	13	
		SAA 1-4, reddish			11	
		Brown Clay, soft (CL)			8	
5		Brown Sandy Clay, wet (CL)	65%		ND	
				0.0	8	
		Grey Clay, wet, soft (CL)			NA	
					NA	
				0.0	NA	
10		Brown Sand, wet (SW)	20%		NA	
				0.0	NA	
		BTH 12' **Refusal @ 12'** Temporary well casing (1" ID w/ 5' screen) set at 12 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
15						
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BORING LOG

Borehole ID: SB-24
Sheet 1 of 1

Location 303 Water Street, Logansport, IN 46947			
Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 17'
Drilling Equip Geoprobe	**Drilling Method** Direct Push / **Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022	3/31/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 8.2	
		Logged By: C. Jones	**Checked by/Date** D. Scovel
Location Description (include sketch in field logbook) Easting 552802.991		Northing 4512318.64	

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Concrete	55%		278	Lead @ 0-1
					402	
		Greyish Sand w/ gravel (SP)			396	
					236	
		Black Sandy Clay (CL)			19	
					20	
		Dark Brown Clay, stiff (CH)			7	
					15	
					10	
					11	
5		SAA 3-5, wet	60%		9	
					11	
		Gravel (GW)			ND	
		Bron Clay, stiff (CH)			ND	
					14	
10		Grey Clay, stiff, wet (CH)	60%		ND	
		Brown Sandy gravel,wet (GP)			ND	
					ND	
					ND	
		Rocks			ND	
15		Brown Sand, wet w/ gravel (SP)	30%		ND	
					ND	
		BTH 17' Temporary well casing (1" ID w/ 5' screen) set at 17 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
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BORING LOG

Borehole ID: SB-25
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 12'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022 / 3/31/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 9.84	
		Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)
Easting 552851.699 Northing 4512282.419

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Brown Organics (Pt)	50%	0.0	804 / 822	XRF DUP @ 0-0.5
					1222	Lead @ 0.5-1
		Grey Sand w/ gravel (SP)			197	
					87	
		Black Sandy Clay (CL)			80	
					19	
					19	
		Rocks		0.0	33	
		Black Sandy Clay, soft (CL)			9	
					6	
5		Brown Sandy Clay (CL)	70%		ND	
		SAA 5-6, wet		0.0	ND	
					NA	
					NA	
		Brown Sandy Clay, rocks (CL)		0.0	NA	
10		Brown Sand, rocks, very wet (SP)	30%		NA	
				0.0	NA	
		BTH 12' **Refusal @ 12'** Temporary well casing (1" ID w/ 5' screen) set at 12 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
15						
20						
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BORING LOG

Borehole ID: SB-26
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		15'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	6.75	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)
Easting 552800.453 Northing 4512265.621

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Black Sandy Clay (CL)	60%	0.0	408	Lead @ 0-0.5'
					219	
					25	
					33	
					20	
					15 / 10	XRF DUP @ 2.5-3
		Brown Sand (SW)			7	
		SAA 0-3		0.0	11	
		Dark Brown Clay (CL)			14	
					6	
5		Light Brown Sandy Clay (CL)	65%		ND	
		SAA 5-6, wet		0.0	ND	
		Light Brown Sand (SW)				
		Grey Sand w/ gravel (SP)			18	
		Grey Sandy Clay, hard (CH)			8	
		Brown Sandy Clay, hard (CH)				
		Grey Sandy Clay, hard (CH)		0.0	10	
10		Brown Sandy Clay, wet (CL)	100%		ND	
				0.0	ND	
		Brown Sandy Clay, hard (CH)			ND	
		Greyish Sand, wet (SW)		0.0	ND	
					ND	
15		**BTH 15'** Temporary well casing (1" ID w/ 5' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						

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BORING LOG

Borehole ID: SB-27
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		5'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)

Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Black Organics (Pt)	70%		1509	Lead @ 0-0.5' + DUP
		Dark Brown Silty Sand w/ organics (SM)		0.0	299 55 18	
		Brown Sand w/ gravel (SP)			18 12	
		Brown Sandy Clay, soft (CL)		0.0	13 12 15 11	
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-28
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		5'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)

Easting 552750.209 Northing 4512247.307

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Brown Organics (Pt)	55%		66	Lead @ 0-1'
		Brown Sandy Clay w/ gravel (CL)		0.0	26 39 7 11 14	
		Dark Brown Clay, soft (CL		0.0	8 & 12 11	XRF DUP @ 3-3.5
		Very Dark Brown Sandy Clay, hard (CH)			ND ND	
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-29
Sheet 1 of 1

Location	303 Water Street, Logansport, IN 46947			
Project Name: Former Exide Corporation	**Project Number**: 22-104		**Site Address**: 303 Water Street, Logansport, IN 46947	
Drilling Company: Seratech	**Driller**: Sean Hall		**Ground Elevation**:	**Total Drilled Depth**: 5'
Drilling Equip: Geoprobe	**Drilling Method**: Direct Push	**Borehole Dia**: 1"	**Date Drilling Started/Completed**: 3/30/2022	3/31/2022
Type of Sampling Device: 5' Acetate Sleeve			**Water Level (bgs)**: N/A	
			Logged By: C. Jones	**Checked by/Date**: D. Scovel

Location Description (include sketch in field logbook)
Easting 552696.74 Northing 4512242.258

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0						
		Brown Organics (Pt)	65%		200	
		Brown Sand w/ gravel (SP)			53	
		Black Sand w/ gravel (SP)		0.0	251	Lead @ 1-1.5'
		SAA (0.5-1)			22	
		Dark Brown Sandy Clay, soft (CL)			6	
					9	
					7	
				0.0	9	
					12	
5					13	
		BTH 5'				
		Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-30
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name	Project Number	Site Address	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		5'

Drilling Equip	Drilling Method	Borehole Dia	Date Drilling Started/Completed	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	Water Level (bgs)	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)
Easting 552599.475 Northing 4512274.364

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Brown Organics (Pt)	60%		555	
		Brown Sand (SW)			239	
		Brown Sandy Clay (CL)		0.0	856	
					6790	Lead @ 1.5-2'
		Black Sandy Clay, stiff (CH)			275	
					46	
		Dark Brown Clay (CL)			26	
				0.0	12	
		Light Brown Clay (CL)			12	
		Light Brown Sand (SW)			10	
5		**BTH 5'**				
		Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-31
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name	**Project Number**	**Site Address**
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947

Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		5'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**
5' Acetate Sleeve	N/A

	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)
Easting 552547.902 Northing 4512301.165

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Rocks	60%		82	
		Gravelly Sand (SP)			473	Lead @ 0.5-1'
		Brown Sandy Clay (CL)		0.0	54	
		Black Gravelly Sand (SP)			24	
		Dark Brown Clay (CL)			16	
					14	
		Light Brown Sandy Clay (CL)			17	
				0.0	8	
		Brown Sandy Clay (CL)			13	
					ND	
5		**BTH 5'**				
		Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-32
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947		
Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022 / 3/31/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552554.776 Northing 4512360.946

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Concrete Slab	30%		54 ND 25	
		Concrete			ND ND ND ND ND	
		Black Clay (CL)			46 ND	Lead @ 4-5
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-33
Sheet 1 of 1

Location 303 Water Street, Logansport, IN 46947				
Project Name Former Exide Corporation	**Project Number** 22-104		**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall		**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022	3/31/2022
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** N/A	
			Logged By: C. Jones	**Checked by/Date** D. Scovel
Location Description (include sketch in field logbook) Easting 552554.636			Northing 4512398.671	

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Rocks	50%		ND	
		Brown Sand w/ gravel (SP)		0.0	11	Lead @ 1-2'
					40	
					16	
		Dark Brown Sand w/ gravel (SP)			15	
					ND	
		Light Brown Sand w/ Gravel (SP)			ND	
				0.0	11	
		Brown Sandy Clay (CL)			19	
					ND	
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-34
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		5'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)
Easting 552611.886 Northing 4512409.256

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Asphalt	55%		83	Lead @ 3-4'
		Light Brown Sand w/ gravel (SP)		0.0	47	
					11	
					184	
		Dark Brown Sand w/ gravel (SP)			216	
					279	
				0.0	375	
					ND	
		Rocks			59	
5		Dark Brown Clay, soft (CL)			ND	
		BTH 5' Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-35
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104		**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall		**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022	3/31/2022
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** N/A	
			Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)
Easting 552743.788 Northing 4512359.997

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Rocks	55%		444	Lead @ 0-0.5'
		Dark Brown Sandy Clay, soft (CL)			300	
		Dark Brown Clay, soft (CL)		0.0	160	
					134	
		Brown Clay, soft (CL)			25	
					12	
					9	
				0.0	7	
					8	
		SAA, 1-2			12	
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-36
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation		**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech		**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022	3/31/2022
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** N/A	
			Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)
Easting 552784.591 Northing 4512341.589

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Sand w/ rocks (SP)	65%		1192	Lead @ 0-0.5'
					70	
		Dark Brown Sandy Clay w/ gravel (CL)		0.0	293 / 318	XRF DUP @ 1-1.5
					129	
		Dark Brown Clay, soft (CL)			126	
					9	
					9	
				0.0	8	
		Grayish Brown Clay, soft (CL)			ND	
					12	
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-37
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		5'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	3/30/2022	3/31/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	C. Jones	D. Scovel

Location Description (include sketch in field logbook)

Easting 552748.168 Northing 4512330.191

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Sand w/ rocks (SP)	50%	0.0	18	DUP XRF @ 0.5-1
		Light Brown Sand w/ gravel (SP)			37 / 15	
		Brown Sand w/ gravel (SP)			25	
					25	
		SAA, stained black			184	
					153	
		SAA		0.0	333	Lead @ 3-4'
					ND	
					ND	
		Brown Sandy Clay, soft (CL)			15	
5		**BTH 5'**				
		Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-38
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022 / 3/31/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)
Easting 552687.199 Northing 4512357.945

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		White Silty Sand (SM)	70%	0.0	85 345 132	Lead @ 0-1'
		Black Sandy Clay (CL)			166 20 8	
		Black Clay, soft (CL)		0.0	7 11	
5		Dark Brown Clay, soft (CL)			10 10	
		BTH 5' Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-39
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022 / 3/31/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552682.154 Northing 4512293.195

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Brick	35%		104	Lead @ 0-1'
		Sand w/ brick			71 / 40	XRF DUP @ 0.5-1
		Brown Sand w/ gravel, hard (SP)		0.0	21	
					21	
					7	
					15	
		Brown Sandy Clay w/ gravel, hard (CH)			11	
				0.0	16	
					16	
5					106	
		BTH 5' Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-40
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022 / 3/31/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552610.991 Northing 4512319.922

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Concrete	60%		14	
		Brown sandy w/ gravel (SP, GP)		0.0	8	
					13	
		White Gravelly Sand (SP, GP)			ND	
					24	Lead @ 2-2.5'
					30	
		Brown sandy clay (CL)			ND	
		Dark Brown Clay (CL)		0.0	ND	
					ND	
					ND	
5		BTH 5'				
		Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-41
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'

Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 3/30/2022	3/31/2022

Type of Sampling Device 5' Acetate Sleeve	**Water Level (bgs)** N/A	
	Logged By: C. Jones	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552570.562 Northing 4512332.133

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Sand w/ rocks (SP)	50%		ND	
		Brown Sand w/ gravel (SP)		0.0	13 11	
		Light Brown Sand w/ gravel (SP)			ND 10	Lead @ 2-3'
		Black Sandy Gravel (GP)			219 88	
		Dark Brown Sandy Clay (CL)		0.0	207 62 45	
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-42
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 10/14/2022 / 10/14/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: Lilli Routt	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0						MS/MSD
		Medium Sandy gravel (GP)	70%			
		Coal Ash and Cinder (CAC)				
		Yellow/Red sand (SP)				
		Silty clay with some sand (CL)				
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-43
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 10/14/2022 / 10/14/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: Lilli Routt	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel (GP)	70%			DUP Offset (2.5 ft)
		Coal Ash and Cinder (CAC) and sand (SP)				
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: SB-44
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation		**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947		
Drilling Company Seratech		**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 5'	
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 10/14/2022	10/14/2022	
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** N/A		
			Logged By: Lilli Routt	**Checked by/Date** D. Scovel	

Location Description (include sketch in field logbook)
Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Sandy gravel (SP)	70%			
		Coal Ash and Cinder (CAC)				
		Sandy silt (SM)				
		Clay (CL)				
5		**BTH 5'** Hole backfilled with granular bentonite.				
10						
15						
20						
25						

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BORING LOG

Borehole ID: HS-1
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104		**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall		**Ground Elevation**	**Total Drilled Depth** 13'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 10/14/2022	10/14/2022
Type of Sampling Device 5' Acetate Sleeve			**Water Level (bgs)** N/A	
			Logged By: Lilli Routt	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)

Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Fill + Coal Ash and Cinder (CAC)	70%	2.8		Sampled 2'
		Medium Sandy Gravel (SP)		0.2		
		Sandy clay with gravel (SC)		0.4		
5		Black clay (CL)	70%	17.4		Odor - sampled 6'
		Clay with gravel (GC)		0.1		
		Yellow/red clay (CL) - smear		0.1		
		Rocks with some clay		0.3		
10		Sandy silty gravel - possible cobble	60%	0.0		
		BTH 13' Hole backfilled with granular bentonite				
15						
20						
25						

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BORING LOG

Borehole ID: HS-2
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		14'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	10/14/2022	10/14/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	Lilli Routt	D. Scovel

Location Description (include sketch in field logbook)

Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel	70%	0.0		
		Fill & Coal Ash and Cinder (CAC)		0.0		
		Brown silty clay (CL)		0.0		
5		Grey gravel sand (GS)	70%	0.0		Sampled 5' Sampled 6'
		Medium Brown sand (SP)		0.0		Sampled 7'
		Silty Sandy Clay (SM) - smear		0.0		
		Sandy silty GRVC - possible cobble		0		
10		Medium Brown sand (SP)	60%	0.0		
		Sandy silty clay (till) (SM)		0.0		
		BTH 14' Hole backfilled with granular bentonite				
15						
20						
25						

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BORING LOG

Borehole ID: HS-3
Sheet 1 of 1
Location 303 Water Street, Logansport, IN 46947

Project Name Former Exide Corporation	**Project Number** 22-104	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company Seratech	**Driller** Sean Hall	**Ground Elevation**	**Total Drilled Depth** 9.75'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 1"	**Date Drilling Started/Completed** 10/14/2022 / 10/14/2022
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	
		Logged By: Lilli Routt	**Checked by/Date** D. Scovel

Location Description (include sketch in field logbook)
Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		0 - 8" concrete	70%			
		Fill + Coal Ash and Cinder (CAC)		0.1		
		Brown silty clay (CL)		0.1		Sampled 5'
5		Brown silty clay (CL)	50%	0.0		Sampled 6'
		Brown/grey fine silty sand (wet @ 8.5') (SM)		0.0		Sampled 8'
10						
15		**BTH 9.75' (refusal)** Hole backfilled with granular bentonite				
20						
25						

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BORING LOG

Borehole ID: HS-4
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947

Project Name	**Project Number**	**Site Address**	
Former Exide Corporation	22-104	303 Water Street, Logansport, IN 46947	
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
Seratech	Sean Hall		13.7'

Drilling Equip	**Drilling Method**	**Borehole Dia**	**Date Drilling Started/Completed**	
Geoprobe	Direct Push	1"	10/14/2022	10/14/2022

Type of Sampling Device	**Water Level (bgs)**	
5' Acetate Sleeve	N/A	
	Logged By:	**Checked by/Date**
	Lilli Routt	D. Scovel

Location Description (include sketch in field logbook)

Easting 552819.775 Northing 4512254.54

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		T.S. And gravel	70%			
		Fill + Coal Ash and Cinder (CAC)				
		Brown-black silty clay (CL)				Sampled 5'
5		Fine sand - silty sand (SP)	70%			Sampled 6'
		Grey silty clay (CL)				Sampled 8'
		Gravel - large (GP)				
		Clay WGRVL (CL)				
10		Sandy silty gravel - cobble @ 13'	60%			
		BTH 13.7' Hole backfilled with granular bentonite				
15						
20						
25						

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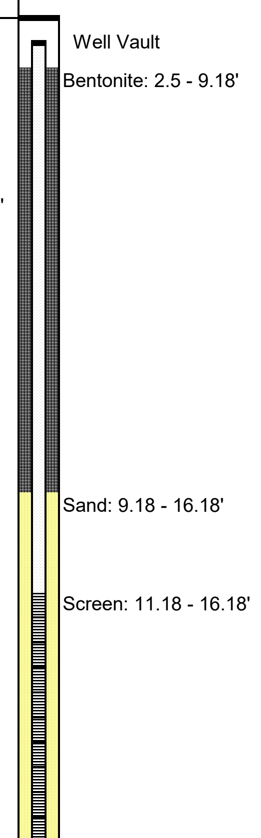
BORING LOG

Borehole ID: SB-20 / MW-1
Sheet 1 of 1

Location	303 Water Street, Logansport, IN 46947			**Well Construction Diagram**	
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947		Well Diameter:	1"
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'	Material:	PVC
Drilling Equip Geoprobe	**Drilling Method** Direct Push / **Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020	Well Depth:	16.18
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 7.21'		Ground Surface Elevation:	NA
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021	Top-of-Casing Elevation:	
Location Description (include sketch in field logbook) Easting 552515.574		Northing 4512223.501		Screen Slot Size:	0.010"

Depth	Description	Recovery	PID ppm	XRF	Remarks
0	Top Soil	70%		130	
	CAC		0.0	169, 78	
	Brn Sandy Clay (CL) w/ Gravel (GP)		0.0	17, 22, <15, <10, <13, <12	Metals, PAHs, Herbicides (+MS/MSD) @ 0-2' 2" Interval of Rock Frag. @ 3'
5	Brn Sand & Gravel (SP-GP)	80%		24, 15	
	Brn Sandy Clay & Gravel (CL-GP), Wet		0.0	20, <13	
	Gry Clay (CL), Stiff		0.0	13, 11	
10	Brn Clayey Sand (SC), Wet	100%	0.0		VOCs (+MS/MSD) @ 11'
	Gry Clayey Sand (SC), Wet, Increased Grain Size w/ Depth		0.0		
15	**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20					
25					

Well Construction Diagram



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BORING LOG

Borehole ID: SB-11 / MW-2
Sheet 1 of 1

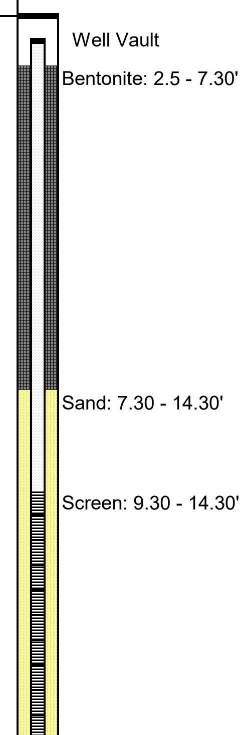
Location	303 Water Street Logansport, IN 46947		
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 15'
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/8/2020 / 12/8/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 8.60'	
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021
Location Description (include sketch in field logbook)	Easting 552515.958	Northing 4512349.023	

Well Construction Diagram

Well Diameter:	1"
Material:	PVC
Well Depth:	14.3
Ground Surface Elevation:	NA
Top-of-Casing Elevation:	
Screen Slot Size:	0.010"

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Gravel	90%		100	
		Drk Brn Silty Sand (SM), Some Pea Gravel (GP)		0.0	92 68 51	Metals, PAHs @ 0-2'
5		Brn Sandy Clay (CL), Few Pea Gravels (GP)		0.0	<11 14 19 16 <12 18 22	
		Fractured Rock Frag., Brn Sand & Gravel (SP-GP), Wet @ 9'	50%	0.0 0.0	30 18 <19 13	
10		Brn Sand & Gravel (SP-GP), Coarse, Increased Sand & Gravel Size w/ Depth, Wet	90%	0.0		VOCs @ 11'
		Brn Sandy Clay (CL), Stiff, Wet		0.0		
15		**BTH 15'** Temporary well casing (1" ID w/ 10' screen) set at 15 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						

Well Construction Diagram



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BORING LOG

Borehole ID: SB-9 / MW-3
Sheet 1 of 1

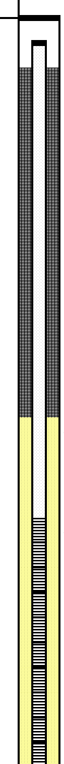
Location	303 Water Street, Logansport, IN 46947			
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947		
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation**	**Total Drilled Depth** 20'	
Drilling Equip Geoprobe	**Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020	12/7/2020
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** 8.60'		
		Logged By: C. Schipp	**Checked by/Date** D.Rust - 3/3/2021	
Location Description (include sketch in field logbook)	Easting 552652.019		Northing 4512309.051	

Well Construction Diagram

Well Diameter:	1"
Material:	PVC
Well Depth:	14.95'
Ground Surface Elevation:	NA
Top-of-Casing Elevation:	
Screen Slot Size:	0.010"

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0–1		Concrete	60%		21 106	
1–3		Brn Sandy Clay (CL), Coarse, Some Gravel (GP)		0.0	1281 259 2.14% 1.1%	PAHs @ 0-2'
3–5		Blk Sandy Clay (CL), Fine, Some Gravel (GP), CAC		0.0	245 244 226 155	Metals @ 2-4'
5–10		Bn Sandy Clay (CL), Mod. Stiff	50%	0.0 0.0	715 <11 <14 <15 <22	
10–13		Gry Sand & Gravel (SP-GP), Rock Frag.	90%	0.0		VOCs @ 14.5'
13–15		Gry Sandy Clay (CL) w/ Gravel (GP), Wet		0.0		
15–20		Gry Sand & Gravel (SP-GP), Coase Sand, Increased Gravel Size w/ Depth	70%	0.0 0.0		
20		**BTH 20'** Temporary well casing (1" ID w/ 10' screen) set at 20 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				

Well Construction Diagram



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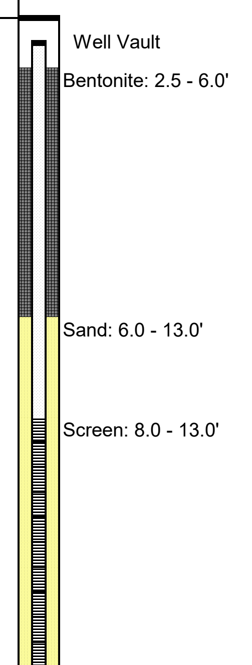
BORING LOG

Borehole ID: SB-14 / MW-4
Sheet 1 of 1

Location	303 Water Street Logansport, IN 46947		**Well Construction Diagram**	
Project Name Former Exide Corporation	**Project Number** 20-280	**Site Address** 303 Water Street, Logansport, IN 46947	Well Diameter:	1"
Drilling Company LT	**Driller** Cody Wheat	**Ground Elevation** / **Total Drilled Depth** 10'	Material:	PVC
Drilling Equip Geoprobe / **Drilling Method** Direct Push	**Borehole Dia** 2.5"	**Date Drilling Started/Completed** 12/7/2020 / 12/7/2020	Well Depth:	13.00'
Type of Sampling Device 5' Acetate Sleeve		**Water Level (bgs)** N/A	Ground Surface Elevation:	NA
		Logged By: C. Schipp / **Checked by/Date** D.Rust - 3/3/2021	Top-of-Casing Elevation:	
Location Description (include sketch in field logbook) Easting 552670.432		Northing 4512257.96	Screen Slot Size:	0.010"

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	80%	0.0	885 681 990	Metals, PAHs @ 1-2'
		Brn Sandy Clay (CL) w/ Pea Gravel (GP)			161 54 22	
		Brn Clay (CL) w/ Pea Gravel (GP)		0.0	14 <12 <10 14	
5			70%	0.0	465 14	
		Lght Brn Sandy Clay (CL)			11	
		Sand & Gravel (SP-GP), Rock Frag., Wet @ 9-10'		0.0	14 <10	
10		**BTH 10'** Hole backfilled with granular bentonite.				
15						
20						
25						

Well Construction Diagram



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BORING LOG

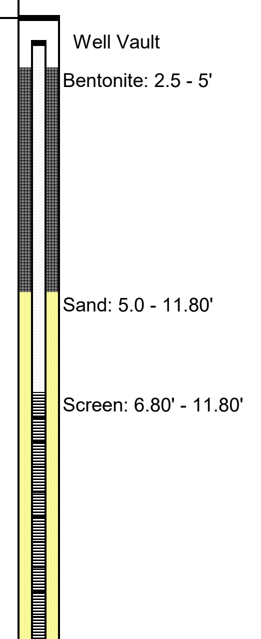
Borehole ID: SB-7 / MW-5
Sheet 1 of 1

Location	303 Water Street, Logansport, IN 46947		
Project Name: Former Exide Corporation	**Project Number**: 20-280	**Site Address**: 303 Water Street, Logansport, IN 46947	
Drilling Company: LT	**Driller**: Cody Wheat	**Ground Elevation**	**Total Drilled Depth**: 13.5'
Drilling Equip: Geoprobe	**Drilling Method**: Direct Push	**Borehole Dia**: 2.5"	**Date Drilling Started/Completed**: 12/7/2020 / 12/7/2020
Type of Sampling Device: 5' Acetate Sleeve		**Water Level (bgs)**: 9.64'	
		Logged By: C. Schipp	**Checked by/Date**: D.Rust - 3/3/2021
Location Description (include sketch in field logbook)	Easting 552826.64	Northing 4512289.688	

Well Construction Diagram

Well Diameter:	1"
Material:	PVC
Well Depth:	11.80'
Ground Surface Elevation:	NA
Top-of-Casing Elevation:	
Screen Slot Size:	0.010"

Depth	Interval	Description	Recovery	PID ppm	XRF	Remarks
0		Top Soil	60%		1528	
		Drk Brn Sandy Clay (CL) w/ CAC, Large Gravel (GP)		0.0	389, 65, 18	Metals, PAHs @ 0-2'
		Brn Clay (CL) w/ Gravel (GP), Large, Rounded		0.0	<9, 26, 16, 29	
5		Drk Brn Sandy Clay (CL), Mod. Stiff			<13, <12, 58	
		Lght Brn Sandy Clay (CL), Mod. Stiff	60%	0.0	<11	
		Lght Brn Sand (SP), Fine, Wet			35	VOCs @ 8'
10		Lght Brn Sand & Gravel (SW-GW), Fine-Coarse w/ Depth	40%	0.0, 0.0	<10, 12	
		BTH 13.5'				
15		Temporary well casing (1" ID w/ 10' screen) set at 13.5 feet and GW sampled. Casing removed and hole backfilled with granular bentonite.				
20						
25						



Appendix E

GPS Coordinate Data

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

GPS Data Table

Site/Facility Name: **Former Exide Battery**
Site Location: **303 Water Street**
Site/Facility ID: **8130 / 22-104 J**
IDEM OLQ Program: **State Site Cleanup - 0000971 / IBP #4221108**
Purpose of Data Collection: Soil & Groundwater Sample Locations

Data Collector Name: Jake Allgood, Chris Jones
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Nomad 900 G
Reciever Type: Mapping Grade GPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Time	Data File Name	Total Positions	Vert Precision	Horiz Precision	Standard Deviation	Easting meters	Northing meters	HAE meters
Soil Borings	SB- 1	1	N/A	N/A	Not Sampled	3.1	Postprocessed Code	Nomad	12/9/2020	11:03:04am	EXIDE.cor	184	0.7	1.4	0.990746	552498.214	4512447.76	183.348
Soil Borings	SB- 2	1	N/A	N/A	Not Sampled	6.4	Postprocessed Code	Nomad	12/9/2020	11:06:49am	EXIDE.cor	182	0.8	1.7	1.221088	552580.455	4512425.878	183.451
Soil Borings	SB- 3	1	N/A	N/A	Not Sampled	2.1	Postprocessed Code	Nomad	12/9/2020	11:11:37am	EXIDE.cor	212	0.6	1.3	1.100685	552647.895	4512398.759	183.369
Soil Borings	SB- 4	1	N/A	N/A	Not Sampled	2.3	Postprocessed Code	Nomad	12/9/2020	11:17:17am	EXIDE.cor	186	0.9	1.6	0.832192	552717.664	4512383.283	182.763
Soil Borings	SB- 5	1	N/A	N/A	Not Sampled	26.8	Postprocessed Code	Nomad	12/9/2020	11:21:30am	EXIDE.cor	231	1	2.2	1.129525	552811.821	4512352.802	182.495
Soil Borings	SB- 6	1	N/A	N/A	Not Sampled	7.5	Postprocessed Code	Nomad	12/9/2020	09:44:19am	EXIDE.cor	269	0.7	1.6	1.578874	552836.748	4512324.696	185.675
Soil Borings	SB- 7	1	N/A	N/A	Not Sampled	3.8	Postprocessed Code	Nomad	12/9/2020	09:49:25am	EXIDE.cor	201	0.7	1.5	1.13209	552826.64	4512289.688	184.849
Soil Borings	SB- 8	1	N/A	N/A	Not Sampled	2.1	Postprocessed Code	Nomad	12/9/2020	09:54:35am	EXIDE.cor	207	0.6	1.4	0.761806	552704.451	4512283.379	184.612
Soil Borings	SB- 9	1	N/A	N/A	Not Sampled	2	Postprocessed Code	Nomad	12/9/2020	09:59:19am	EXIDE.cor	207	0.7	1.5	1.098293	552652.019	4512309.051	185.263
Soil Borings	SB- 10	1	N/A	N/A	Not Sampled	2.6	Postprocessed Code	Nomad	12/9/2020	10:03:22am	EXIDE.cor	205	0.7	1.9	0.794604	552609.751	4512366.434	184.363
Soil Borings	SB- 11	1	N/A	N/A	Not Sampled	2.9	Postprocessed Code	Nomad	12/9/2020	10:07:38am	EXIDE.cor	184	0.8	1.8	1.621939	552515.958	4512349.023	183.633
Soil Borings	SB- 12	1	N/A	N/A	Not Sampled	896.8	Postprocessed Code	Nomad	12/9/2020	10:12:19am	EXIDE.cor	240	0.7	1.8	1.136501	552566.148	4512290.309	184.095
Soil Borings	SB- 13	1	N/A	N/A	Not Sampled	2.3	Postprocessed Code	Nomad	12/9/2020	10:19:15am	EXIDE.cor	266	0.6	1.3	0.445214	552655.368	4512271.091	184.172
Soil Borings	SB- 14	1	N/A	N/A	Not Sampled	2.4	Postprocessed Code	Nomad	12/9/2020	10:24:02am	EXIDE.cor	283	0.7	1.3	0.545953	552670.432	4512257.96	184.407
Soil Borings	SB- 15	1	N/A	N/A	Not Sampled	2.5	Postprocessed Code	Nomad	12/9/2020	10:30:24am	EXIDE.cor	216	0.7	1.9	1.068374	552765.606	4512238.228	183.349
Soil Borings	SB- 16	1	N/A	N/A	Not Sampled	14.9	Postprocessed Code	Nomad	12/9/2020	10:34:43am	EXIDE.cor	187	0.9	2.1	6.442235	552681.627	4512214.637	184.004
Soil Borings	SB- 17	1	N/A	N/A	Not Sampled	43.4	Postprocessed Code	Nomad	12/9/2020	10:41:12am	EXIDE.cor	339	1.4	2.6	4.283159	552587.944	4512221.288	186.626
Soil Borings	SB- 18	1	N/A	N/A	Not Sampled	2.9	Postprocessed Code	Nomad	12/9/2020	10:47:31am	EXIDE.cor	214	0.7	2	0.702477	552623.898	4512252.056	182.694
Soil Borings	SB- 19	1	N/A	N/A	Not Sampled	4.7	Postprocessed Code	Nomad	12/9/2020	10:51:47am	EXIDE.cor	205	0.8	1.5	0.756138	552526.704	4512272.543	181.666
Soil Borings	SB- 20	1	N/A	N/A	Not Sampled	6.1	Postprocessed Code	Nomad	12/9/2020	10:56:04am	EXIDE.cor	256	0.7	1.6	1.297454	552515.574	4512223.501	182.138
Soil Borings	SB- 21	11.5	11.5 ft	Y	Soil and Groundwater	6.2	Postprocessed Code	Nomad	4/1/2022	01:50:53pm	EXIDE 4-1-2022.cor	212	1.1	2.1	0.824681	552857.062	4512339.219	187.682

GPS Data Table

Site/Facility Name: **Former Exide Battery**
Site Location: **303 Water Street**
Site/Facility ID: **8130 / 22-104 J**
IDEM OLQ Program: **State Site Cleanup - 0000971 / IBP #4221108**
Purpose of Data Collection: Soil & Groundwater Sample Locations

Data Collector Name: Jake Allgood, Chris Jones
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Nomad 900 G
Reciever Type: Mapping Grade GPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Time	Data File Name	Total Positions	Vert Precision	Horiz Precision	Standard Deviation	Easting meters	Northing meters	HAE meters
Soil Borings	SB- 22	15	N/A	Y	Soil and Groundwater	3.1	Postprocessed Code	Nomad	4/1/2022	01:47:04pm	EXIDE 4-1-2022.cor	182	0.9	1.7	1.323464	552790.356	4512361.462	190.095
Soil Borings	SB- 23	12	12 Ft	Y	Soil and Groundwater	3.7	Postprocessed Code	Nomad	4/1/2022	12:08:30pm	EXIDE 4-1-2022.cor	244	1	2.2	1.584327	552859.483	4512318.043	187.612
Soil Borings	SB- 24	17	N/A	Y	Soil and Groundwater	4.9	Postprocessed Code	Nomad	4/1/2022	12:04:24pm	EXIDE 4-1-2022.cor	187	0.8	1.9	1.129479	552802.991	4512318.64	186.085
Soil Borings	SB- 25	12	12 ft	Y	Soil and Groundwater	3.5	Postprocessed Code	Nomad	4/1/2022	12:12:55pm	EXIDE 4-1-2022.cor	211	0.9	2.2	0.594812	552851.699	4512282.419	186.675
Soil Borings	SB- 26	15	N/A	Y	Soil and Groundwater	3.8	Postprocessed Code	Nomad	4/1/2022	12:17:13pm	EXIDE 4-1-2022.cor	228	0.9	2.2	1.933875	552800.453	4512265.621	186.158
Soil Borings	SB- 27	5	N/A	N	Only Soil	2.9	Postprocessed Code	Nomad	4/1/2022	12:21:27pm	EXIDE 4-1-2022.cor	217	1	2.6	1.668881	552819.775	4512254.54	185.023
Soil Borings	SB- 28	5	N/A	N	Only Soil	5.6	Postprocessed Code	Nomad	4/1/2022	12:25:41pm	EXIDE 4-1-2022.cor	253	1	1.9	1.330043	552750.209	4512247.307	186.065
Soil Borings	SB- 29	5	N/A	N	Only Soil	6	Postprocessed Code	Nomad	4/1/2022	12:30:18pm	EXIDE 4-1-2022.cor	201	1	2.3	1.364098	552696.74	4512242.258	185.353
Soil Borings	SB- 30	5	N/A	N	Only Soil	2.1	Postprocessed Code	Nomad	4/1/2022	12:34:45pm	EXIDE 4-1-2022.cor	193	0.9	1.7	0.733474	552599.475	4512274.364	185.959
Soil Borings	SB- 31	5	N/A	N	Only Soil	4.8	Postprocessed Code	Nomad	4/1/2022	12:38:24pm	EXIDE 4-1-2022.cor	212	0.9	1.9	0.789393	552547.902	4512301.165	185.558
Soil Borings	SB- 32	5	N/A	N	Only Soil	3.6	Uncorrected	Nomad	4/1/2022	11:35:02am	EXIDE 4-1-2022.cor	219	1.3	2.8	1.439949	552554.776	4512360.946	184.958
Soil Borings	SB- 33	5	N/A	N	Only Soil	3.7	Postprocessed Code	Nomad	4/1/2022	11:39:08am	EXIDE 4-1-2022.cor	213	1	2	0.566258	552554.636	4512398.671	186.663
Soil Borings	SB- 34	5	N/A	N	Only Soil	6.7	Uncorrected	Nomad	4/1/2022	11:43:20am	EXIDE 4-1-2022.cor	220	1	2	1.332255	552611.886	4512409.256	187.278
Soil Borings	SB- 35	5	N/A	N	Only Soil	4.8	Postprocessed Code	Nomad	4/1/2022	11:51:41am	EXIDE 4-1-2022.cor	183	0.9	2.2	0.882436	552743.788	4512359.997	186.467
Soil Borings	SB- 36	5	N/A	N	Only Soil	4.8	Postprocessed Code	Nomad	4/1/2022	11:55:18am	EXIDE 4-1-2022.cor	267	1	2.3	1.908122	552784.591	4512341.589	186.332
Soil Borings	SB- 37	5	N/A	N	Only Soil	2.4	Postprocessed Code	Nomad	4/1/2022	12:00:14pm	EXIDE 4-1-2022.cor	207	1	2.2	0.614359	552748.168	4512330.191	185.918
Soil Borings	SB- 38	5	N/A	N	Only Soil	4.7	Postprocessed Code	Nomad	4/1/2022	11:47:58am	EXIDE 4-1-2022.cor	190	1.2	2.5	0.719548	552687.199	4512357.945	186.404
Soil Borings	SB- 39	5	N/A	N	Only Soil	2	Postprocessed Code	Nomad	4/1/2022	01:09:49pm	EXIDE 4-1-2022.cor	204	0.7	1.4	0.380792	552682.154	4512293.195	185.162
Soil Borings	SB- 40	5	N/A	N	Only Soil	2.1	Postprocessed Code	Nomad	4/1/2022	12:46:12pm	EXIDE 4-1-2022.cor	290	0.7	1.6	0.820793	552610.991	4512319.922	185.043
Soil Borings	SB- 41	5	NA	N	Only Soil	2	Postprocessed Code	Nomad	4/1/2022	12:42:23pm	EXIDE 4-1-2022.cor	211	0.8	1.9	1.089811	552570.562	4512332.133	185.45
Corners	SS- 1					2.5	Postprocessed Code	Nomad	12/9/2020	11:32:35am	EXIDE.cor	388	0.7	2	1.438963	552800.568	4512357.174	183.748

GPS Data Table

Site/Facility Name: **Former Exide Battery**
Site Location: **303 Water Street**
Site/Facility ID: **8130 / 22-104 J**
IDEM OLQ Program: **State Site Cleanup - 0000971 / IBP #4221108**
Purpose of Data Collection: Soil & Groundwater Sample Locations

Data Collector Name: Jake Allgood, Chris Jones
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Nomad 900 G
Reciever Type: Mapping Grade GPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Time	Data File Name	Total Positions	Vert Precision	Horiz Precision	Standard Deviation	Easting meters	Northing meters	HAE meters
Corners	SS- 2					2.6	Postprocessed Code	Nomad	12/9/2020	11:40:09am	EXIDE.cor	224	0.7	1.6	0.933352	552801.409	4512362.603	183.821
Corners	SS- 3					2.2	Postprocessed Code	Nomad	12/9/2020	11:43:59am	EXIDE.cor	332	0.8	1.8	0.640338	552807.293	4512360.628	183.338
Corners	SS- 4					1.6	Postprocessed Code	Nomad	12/9/2020	11:49:36am	EXIDE.cor	162	0.7	1.6	0.824366	552806.312	4512356.79	183.919
Surface Sample	SS- 7					2.8	Postprocessed Code	Nomad	12/9/2020	11:52:36am	EXIDE.cor	347	0.8	1.8	0.902306	552817.993	4512357.4	184.386
Surface Sample	SS- 8					2.4	Postprocessed Code	Nomad	12/9/2020	11:58:27am	EXIDE.cor	181	0.8	1.8	0.73713	552817.134	4512351.194	184.675
Surface Sample	SS- 9					2.2	Postprocessed Code	Nomad	12/9/2020	12:01:41pm	EXIDE.cor	189	0.8	1.7	0.894103	552832.763	4512351.031	183.973
Surface Sample	SS- 10					2	Postprocessed Code	Nomad	12/9/2020	12:04:55pm	EXIDE.cor	203	0.9	2	1.160994	552830.882	4512348.133	184.043
Monitoring Wells	MW- 1	1	1	1	Only Groundwater	10.9	Real-time SBAS Corrected	Nomad	4/1/2022	01:14:30pm	EXIDE 4-1-2022.cor	206	0.8	1.5	1.027189	552515.014	4512219.641	186.982
Monitoring Wells	MW- 2	1	1	1	Only Groundwater	6.7	Real-time SBAS Corrected	Nomad	4/1/2022	01:05:08pm	EXIDE 4-1-2022.cor	226	0.7	1.7	1.425741	552515.574	4512349.463	185.397
Monitoring Wells	MW- 3	1	1	1	Only Groundwater	2.3	Postprocessed Code	Nomad	4/1/2022	12:55:45pm	EXIDE 4-1-2022.cor	389	0.7	1.6	1.301114	552653.633	4512308.976	186.438
Monitoring Wells	MW- 4	1	1	1	Only Groundwater	2.1	Postprocessed Code	Nomad	4/1/2022	01:19:04pm	EXIDE 4-1-2022.cor	517	0.6	1.3	0.866615	552670.249	4512255.692	186.055
Monitoring Wells	MW- 5	1	1	1	Only Groundwater	2.4	Postprocessed Code	Nomad	4/1/2022	01:28:34pm	EXIDE 4-1-2022.cor	284	0.7	1.3	0.702615	552827.106	4512289.412	185.407

NAD83 (CORS96)
Horizontal
Continuously Operating Reference Stations Readjustment of NAD 83

GPS Data Table

Site/Facility Name: **Former Exide Battery**
Site Location: **303 Water Street**
Site/Facility ID: **8130 / 22-237 J**
IDEM OLQ Program: **State Site Cleanup - 0000971 / IBP #4221108**
Purpose of Data Collection: Soil Sampling

Data Collector Name: David Scovel, LPG
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Nomad 900 G
Reciever Type: Mapping Grade GPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Sample Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Time	Data File Name	Total Positions	Vert Precision	Horiz Precision	Standard Deviation	Easting meters	Northing meters	HAE meters
Soil Borings	HS- 1	13	Yes	No	VOC Hot Spot	6.8	Uncorrected	Nomad	10/14/2022	11:27:56am	EXIDE 3.cor	180	1.2	2.4	0.998875	552812.735	4512303.281	184.413
Soil Borings	HS- 2	14	Yes	No	VOC Hot Spot	18.3	Postprocessed Code	Nomad	10/14/2022	11:31:25am	EXIDE 3.cor	185	1.1	2.2	0.242994	552818.898	4512322.781	184.513
Soil Borings	HS- 3	9.75	Yes	No	VOC Hot Spot	1.9	Postprocessed Code	Nomad	10/14/2022	11:34:47am	EXIDE 3.cor	244	1	2.2	0.62275	552813.241	4512331.541	184.451
Soil Borings	HS- 4	13.7	Yes	No	VOC Hot Spot	1.9	Postprocessed Code	Nomad	10/14/2022	11:39:08am	EXIDE 3.cor	185	0.9	2.3	0.535215	552825.518	4512326.015	184.32
Soil Borings	SB- 42	5	No	No		2	Postprocessed Code	Nomad	10/14/2022	11:47:23am	EXIDE 3.cor	193	1	2.2	0.727583	552721.307	4512270.223	184.289
Soil Borings	SB- 43	5	No	No		1.9	Postprocessed Code	Nomad	10/14/2022	11:43:49am	EXIDE 3.cor	181	0.9	2.3	0.770703	552752.56	4512265.939	184.187
Soil Borings	SB- 44	5	No	No		5.5	Postprocessed Code	Nomad	10/14/2022	11:51:40am	EXIDE 3.cor	187	1	2.3	1.101132	552786.411	4512277.147	184.126

NAD83 (CORS96)
Horizontal
Continuously Operating Reference Stations Readjustment of NAD 83

GPS Data Table

Site/Facility Name: **Former Exide Battery**
Site Location: **303 Water Street**
Site/Facility ID: **8130 / 22-237 J**
IDEM OLQ Program: **State Site Cleanup - 0000971 / IBP #4221108**
Purpose of Data Collection: Soil Gas Survey

Data Collector Name: David Scovel, LPG
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Nomad 900 G
Reciever Type: Mapping Grade GPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Sample Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Time	Data File Name	Total Positions	Vert Precision	Horiz Precision	Standard Deviation	Easting meters	Northing meters	HAE meters
Soil Gas	A- 1	3	No	Yes		7.1	Uncorrected	Nomad	9/9/2022	11:01:02am	EXIDE SGE.cor	181	1.3	2.7	0.811681	552822.555	4512337.161	183.82
Soil Gas	A- 2	3	No	Yes		3	Postprocessed Code	Nomad	9/9/2022	11:41:50am	EXIDE SGE.cor	821	0.8	1.9	0.494466	552819.684	4512327.385	183.335
Soil Gas	A- 3	3	No	Yes		1.7	Postprocessed Code	Nomad	9/9/2022	12:51:53pm	EXIDE SGE.cor	238	1	1.9	0.388256	552816.98	4512318.575	183.674
Soil Gas	A- 5	3	No	Yes		3.1	Postprocessed Code	Nomad	9/9/2022	12:24:35pm	EXIDE SGE.cor	356	1	1.9	0.188053	552811.8	4512302.526	183.617
Soil Gas	B- 1	3	No	Yes		2.4	Postprocessed Code	Nomad	9/9/2022	11:08:25am	EXIDE SGE.cor	180	1.1	2.1	0.397803	552831.734	4512333.255	184.263
Soil Gas	B- 2	3	No	Yes		1.8	Postprocessed Code	Nomad	9/9/2022	11:33:17am	EXIDE SGE.cor	490	0.8	2	0.320891	552828.635	4512325.385	183.406
Soil Gas	B- 3	3	No	Yes		2.7	Postprocessed Code	Nomad	9/9/2022	11:56:39am	EXIDE SGE.cor	312	0.9	2.1	0.58275	552825.234	4512316.5	183.614
Soil Gas	B- 5	3	No	Yes		2.7	Postprocessed Code	Nomad	9/9/2022	12:47:37pm	EXIDE SGE.cor	225	1	2	0.565886	552820.281	4512300.393	183.491
Soil Gas	C- 1	3	No	Yes		2	Postprocessed Code	Nomad	9/9/2022	11:11:39am	EXIDE SGE.cor	182	1	2	0.354844	552840.176	4512330.98	184.254
Soil Gas	C- 2	3	No	Yes		2.1	Postprocessed Code	Nomad	9/9/2022	11:28:34am	EXIDE SGE.cor	272	0.9	2.1	0.287913	552837.272	4512322.671	183.471
Soil Gas	C- 3	3	No	Yes		2.3	Postprocessed Code	Nomad	9/9/2022	12:02:01pm	EXIDE SGE.cor	464	0.9	2	0.171234	552834.858	4512313.735	183.911
Soil Gas	C- 4	3	No	Yes		3.5	Postprocessed Code	Nomad	9/9/2022	12:17:44pm	EXIDE SGE.cor	388	1	1.9	0.521755	552832.111	4512304.272	183.92
Soil Gas	C- 5	3	No	Yes		2.8	Postprocessed Code	Nomad	9/9/2022	12:42:33pm	EXIDE SGE.cor	279	1	1.9	0.262469	552829.191	4512296.532	183.47
Soil Gas	C- 6	3	No	Yes		8.5	Postprocessed Code	Nomad	9/9/2022	12:30:38pm	EXIDE SGE.cor	180	1.2	2.2	4.3845	552825.784	4512289.552	183.504
Soil Gas	D- 1	3	No	Yes		4.1	Postprocessed Code	Nomad	9/9/2022	11:15:13am	EXIDE SGE.cor	180	1	2.1	0.391851	552848.199	4512328.848	184.122
Soil Gas	D- 2	3	No	Yes		2.3	Postprocessed Code	Nomad	9/9/2022	11:18:32am	EXIDE SGE.cor	588	0.9	2	0.314041	552844.462	4512320.216	183.767
Soil Gas	D- 3	3	No	Yes		5.4	Postprocessed Code	Nomad	9/9/2022	12:09:51pm	EXIDE SGE.cor	208	0.9	2	0.541401	552842.838	4512310.855	184.028
Soil Gas	D- 4	3	No	Yes		3.5	Postprocessed Code	Nomad	9/9/2022	12:13:44pm	EXIDE SGE.cor	214	1	1.9	1.218271	552840.031	4512300.925	183.979
Soil Gas	D- 5	3	No	Yes		6.1	Postprocessed Code	Nomad	9/9/2022	12:38:21pm	EXIDE SGE.cor	229	1	2	0.171992	552836.725	4512293.601	183.462
Soil Gas	D- 6	3	No	Yes		3	Postprocessed Code	Nomad	9/9/2022	12:34:25pm	EXIDE SGE.cor	183	1.1	2.1	0.209435	552834.309	4512285.991	183.489
Soil Gas	SGeS- 1	3	No	Yes		4.1	Postprocessed Code	Nomad	9/9/2022	01:12:15pm	EXIDE SGE.cor	180	0.9	2.4	1.731055	552856.412	4512327.889	184.636

GPS Data Table

Site/Facility Name: **Former Exide Battery**
Site Location: **303 Water Street**
Site/Facility ID: **8130 / 22-237 J**
IDEM OLQ Program: **State Site Cleanup - 0000971 / IBP #4221108**
Purpose of Data Collection: Soil Gas Survey

Data Collector Name: David Scovel, LPG
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Nomad 900 G
Reciever Type: Mapping Grade GPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Sample Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Time	Data File Name	Total Positions	Vert Precision	Horiz Precision	Standard Deviation	Easting meters	Northing meters	HAE meters
Soil Gas	SGeS- 2	3	No	Yes		4.1	Postprocessed Code	Nomad	9/9/2022	01:15:43pm	EXIDE SGE.cor	220	0.9	2.5	1.811861	552856.338	4512311.881	184.654
Soil Gas	SGeS- 3	3	No	Yes		2.8	Postprocessed Code	Nomad	9/9/2022	01:20:11pm	EXIDE SGE.cor	181	0.9	2.7	1.497417	552857.463	4512296.446	184.729
Soil Gas	SGss- 2	3	No	Yes		2	Postprocessed Code	Nomad	9/9/2022	01:34:21pm	EXIDE SGE.cor	222	0.8	2.4	1.366285	552806.872	4512320.997	185.071
Soil Gas	SGss- 1	3	No	Yes		3.6	Postprocessed Code	Nomad	9/9/2022	01:38:22pm	EXIDE SGE.cor	214	0.7	2.3	0.621889	552809.163	4512335.933	185.232
Soil Gas	CV- 1 mar	4	No	Yes		2	Postprocessed Code	Nomad	9/9/2022	01:42:29pm	EXIDE SGE.cor	218	0.7	2.2	0.75492	552789.618	4512338.217	185.641

NAD83 (CORS96)
Horizontal
Continuously Operating Reference Stations Readjustment of NAD 83

GPS Data Table

Site/Facility Name: **Former Exide Factory**
Site Location: **303 Water Street**
BCA Project ID: **23-227**
IDEM Site/Facility ID:
OLQ Program: **IBP**
Purpose of Data Collection: Supplemental Phase II Investigation

Data Collector Name: Dan Rust
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Geode 351441
Reciever Type: Survey Grade DGPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Total Positions	Vert Precision (meters)	Horiz Precision (meters)	Standard Deviation	Easting meters	Northing meters	Elevation meters
Surface Sample	SS- 101	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	7	0.5	0.800		4512360.860	552794.061	185.986
Surface Sample	SS- 102	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	5	0.5	0.800		4512367.000	552781.482	184.506
Surface Sample	SS- 103	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	7	0.5	0.800		4512372.106	552770.174	183.219
Surface Sample	SS- 104	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	5	0.5	0.800		4512342.988	552857.243	183.198
Surface Sample	SS- 105	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	25	0.5	0.800		4512337.580	552854.797	183.687
Surface Sample	SS- 106	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	14	0.5	0.800		4512339.815	552843.381	183.521
Surface Sample	SS- 107	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	16	0.6	0.800		4512341.288	552836.092	184.274
Surface Sample	SS- 108	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.5	0.800		4512344.012	552825.642	183.574
Surface Sample	SS- 109	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	36	0.5	0.800		4512331.527	552843.474	184.943
Surface Sample	SS- 110	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.5	0.800		4512333.573	552836.931	183.483
Surface Sample	SS- 111	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.5	0.800		4512337.464	552827.155	183.906
Surface Sample	SS- 112	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	37	0.5	0.800		4512337.755	552821.323	184.645
Surface Sample	SS- 113	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.5	0.800		4512330.282	552820.642	183.875
Surface Sample	SS- 114	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	35	0.5	0.800		4512324.395	552817.039	184.327
Surface Sample	SS- 115	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	33	0.5	0.700		4512339.754	552819.717	184.92
Surface Sample	SS- 116	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	33	0.5	0.700		4512318.734	552819.580	183.236
Surface Sample	SS- 117	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.5	0.800		4512312.376	552828.471	
Surface Sample	SS- 118	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	37	0.5	0.700		4512322.177	552826.090	183.378
Surface Sample	SS- 119	0.5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	9/6/2023	40	0.5	0.700		4512314.103	552835.850	183.374
Surface Sample	SS- 120	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	36	0.6	0.800		4512299.124	552831.466	183.715
Surface Sample	SS- 121	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	33	0.6	0.800		4512298.146	552822.267	183.53
Surface Sample	SS- 122	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	39	0.6	0.800		4512301.523	552812.496	184.193
Surface Sample	SS- 123	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	34	0.6	0.800		4512291.924	552809.530	183.543
Surface Sample	SS- 124	0.5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.6	0.800		4512292.816	552815.986	182.696
Surface Sample	SS- 125	0.5	No	No		1.1	ThreeDimensional DGPS	Geode 351441	9/6/2023	35	0.6	0.900		4512290.793	552825.010	183.419
Surface Sample	SS- 126	0.5	No	No		1.1	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.6	0.900		4512295.227	552829.392	183.182
Surface Sample	SS- 127	0.5	No	No		1.1	ThreeDimensional DGPS	Geode 351441	9/6/2023	32	0.6	0.900		4512306.922	552834.134	183.444
Surface Sample	SS- 128	0.5	No	No		1.1	ThreeDimensional DGPS	Geode 351441	9/6/2023	33	0.6	0.900		4512318.552	552833.582	183.185
Surface Sample	SS- 129	0.5	No	No		1.1	ThreeDimensional DGPS	Geode 351441	9/6/2023	31	0.6	0.900		4512332.302	552827.746	183.029
Soil Gas Sample	SGss 1	3	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	4	0.6	0.800		4512329.527	552808.784	184.146
Soil Gas Sample	SGss 2	3	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-28T	7	0.6	0.700		4512324.313	552802.157	183.753
Soil Gas Sample	SGss 3	3	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	4	0.6	0.800		4512321.336	552811.331	183.584
Soil Gas Sample	SGss 4	3	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	7	0.6	0.900		4512317.036	552804.487	183.846
Soil Gas Sample	SGss 5	3	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	6	0.6	0.800		4512309.469	552808.120	183.357
Soil Gas Sample	SGss 6	3	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	5	0.6	0.900		4512302.769	552804.897	183.24
Soil Probe	HS -5 20E	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512328.237	552813.803	185.078
Soil Probe	HS -5 20N	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512335.742	552810.231	184.383
Soil Probe	HS - 1 10E	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512300.475	552816.084	184.923
Soil Probe	HS - 1 10S	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512298.375	552811.869	184.799
Soil Probe	HS - 1 10W	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512301.880	552810.186	184.948
Soil Probe	HS - 5	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512329.731	552808.327	185.218
Soil Probe	HS - 5 20W	15	No	Yes		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512331.376	552802.876	184.359
Soil Probe	Hs1	15	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.5	0.800		4512301.199	552812.409	184.042
Soil Probe	Hs1-20e	15	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512299.517	552818.023	183.98
Soil Probe	Hs1-20s	15	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512295.882	552811.160	184.045
Soil Probe	Hs1-20w	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512302.488	552806.724	185.772

GPS Data Table

Site/Facility Name: **Former Exide Factory**
Site Location: **303 Water Street**
BCA Project ID: **23-227**
IDEM Site/Facility ID:
OLQ Program: **IBP**
Purpose of Data Collection: Supplemental Phase II Investigation

Data Collector Name: Dan Rust
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Geode 351441
Reciever Type: Survey Grade DGPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Total Positions	Vert Precision (meters)	Horiz Precision (meters)	Standard Deviation	Easting meters	Northing meters	Elevation meters
Soil Probe	SB- 3R	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512400.026	552650.441	184.619
Soil Probe	SB- 3R - 5E	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	27	0.5	0.700		4512399.339	552651.959	184.394
Soil Probe	SB- 3R - 5W	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	27	0.5	0.700		4512399.972	552649.604	184.448
Soil Probe	SB- 5R	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	26	0.5	0.700		4512356.544	552810.268	184.694
Soil Probe	SB- 6R	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512322.422	552831.119	185.766
Soil Probe	SB- 7R	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512289.497	552825.889	184.854
Soil Probe	SB- 8R	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512277.979	552703.668	184.537
Soil Probe	SB- 12R	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512291.880	552558.318	184.167
Soil Probe	SB- 46	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	26	0.5	0.800		4512304.856	552714.660	185.114
Soil Probe	SB- 47	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512298.805	552742.336	184.171
Soil Probe	SB- 48	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512293.789	552764.120	183.984
Soil Probe	SB- 49	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512273.307	552736.133	184.527
Soil Probe	SB- 50	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512255.684	552728.682	184.741
Soil Probe	SB- 51	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512256.332	552694.275	184.574
Soil Probe	SB- 52	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512329.908	552677.937	185.177
Soil Probe	SB- 53	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512318.590	552674.387	185.083
Soil Probe	SB- 54	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512292.750	552633.333	184.434
Soil Probe	SB- 55	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512277.904	552621.380	184.355
Soil Probe	SB- 56	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512298.832	552616.881	184.409
Soil Probe	SB- 57	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512306.908	552596.363	184.38
Soil Probe	SB- 58	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	24	0.6	0.800		4512285.046	552593.084	184.24
Soil Probe	SB- 59	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	23	0.6	0.900		4512280.558	552586.020	184.108
Soil Probe	SB- 60	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512272.099	552590.917	183.619
Soil Probe	SB- 61	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512338.164	552615.897	185.103
Soil Probe	SB- 62	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	26	0.5	0.700		4512350.299	552607.574	185.133
Soil Probe	SB- 63	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	26	0.5	0.700		4512348.678	552598.946	185.085
Soil Probe	SB- 64	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512336.887	552604.035	185.156
Soil Probe	SB- 65	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-02T	23	0.6	0.900		4512279.747	552592.232	184.232
Soil Probe	SB- 66	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-02T	25	0.6	0.800		4512289.478	552719.499	184.592
Soil Probe	SB- 67 ground leve	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.900		4512332.057	552831.401	183.273
Soil Probe	SB- 67 pole	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.900		4512332.140	552830.868	185.399
Soil Probe	SB- 68	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.800		4512274.183	552757.004	184.98
Soil Probe	SB- 69	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.800		4512286.206	552748.412	184.881
Soil Probe	SB- 70	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.800		4512271.477	552722.858	185.352
Soil Probe	SB- 71	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.800		4512266.815	552701.454	185.155
Soil Probe	SB- 72	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.800		4512257.154	552650.618	184.806
Soil Probe	SB- 73	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.6	0.800		4512265.673	552623.862	184.858
Soil Probe	SB- 74	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	26	0.5	0.800		4512296.537	552537.772	184.663
Soil Probe	SB- 75	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	26	0.5	0.800		4512325.417	552555.936	184.948
Soil Probe	SB- 76	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	26	0.5	0.700		4512315.777	552576.085	184.863
Soil Probe	SB- 77	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	27	0.5	0.700		4512324.732	552595.204	185.436
Soil Probe	SB- 78	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	27	0.5	0.700		4512333.958	552588.987	185.345
Soil Probe	SB- 79	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	27	0.5	0.700		4512344.935	552631.974	185.167
Soil Probe	SB- 80	10	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	26	0.5	0.700		4512300.526	552690.353	185.119
Soil Probe	SB- 81	10	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	25	0.5	0.800		4512311.735	552749.093	184.644
Soil Probe	SB- 82	6	Yes	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-11-06T	24	0.6	0.800		4512276.018	552684.413	185.029
Soil Probe	SB- 83	10	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-11-06T	28	0.5	0.700		4512354.930	552575.352	184.867

GPS Data Table

Site/Facility Name: **Former Exide Factory**
Site Location: **303 Water Street**
BCA Project ID: **23-227**
IDEM Site/Facility ID:
OLQ Program: **IBP**
Purpose of Data Collection: Supplemental Phase II Investigation

Data Collector Name: Dan Rust
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Geode 351441
Reciever Type: Survey Grade DGPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Total Positions	Vert Precision (meters)	Horiz Precision (meters)	Standard Deviation	Easting meters	Northing meters	Elevation meters
Soil Probe	Sb7	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512287.714	552826.211	183.781
Soil Probe	SB7 40se	1	No	No		1.2	ThreeDimensional DGPS	Geode 351441	2023-08-28T	23	0.7	1.000		4512274.604	552831.886	182.324
Soil Probe	SB7 40sw	1	No	No		1.2	ThreeDimensional DGPS	Geode 351441	2023-08-28T	23	0.7	1.000		4512280.149	552811.411	182.242
Soil Probe	SB7 - 40s	1	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	24	0.6	0.900		4512276.700	552823.164	182.304
Soil Probe	SB7-20s	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512283.587	552825.774	183.339
Soil Probe	SB7-20w	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512286.202	552819.813	183.311
Soil Probe	SB9	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512309.534	552652.751	183.993
Soil Probe	SB9-20e	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512308.348	552656.075	184.05
Soil Probe	SB9-20n	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512315.331	552654.183	184.018
Soil Probe	SB9-20s	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512304.501	552651.398	184.071
Soil Probe	SB9-20w	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512310.832	552647.463	184.039
Soil Probe	SB9-28ne	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512313.676	552658.389	183.869
Soil Probe	SB9-28nw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512316.404	552648.773	183.805
Soil Probe	SB9-28se	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512303.351	552655.077	184.046
Soil Probe	SB9-28sw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512306.109	552646.045	183.818
Soil Probe	SB9-40e	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512306.539	552661.957	183.344
Soil Probe	SB9-40e30e	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512305.346	552668.995	183.352
Soil Probe	SB9-40e30n	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512310.954	552667.201	183.294
Soil Probe	SB9-40e30s	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512298.952	552663.159	183.093
Soil Probe	SB9-40s	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	33	0.4	0.800		4512299.175	552647.869	183.579
Soil Probe	SB9-40w	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512312.204	552641.700	183.763
Soil Probe	SB9-40w30n	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512319.624	552641.280	183.619
Soil Probe	SB9-40w30s	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512308.251	552638.141	183.65
Soil Probe	SB9-40w30w	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512315.093	552635.186	183.657
Soil Probe	SB9-60sw	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512302.031	552635.337	183.06
Soil Probe	SB9-75nw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512327.506	552643.979	183.629
Soil Probe	SB9-75se	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512289.926	552664.377	183.067
Soil Probe	SB9-75sse	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512290.287	552654.295	182.978
Soil Probe	SB9-100s	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512283.168	552646.552	182.827
Soil Probe	SB9-100sse	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512283.203	552658.348	182.949
Soil Probe	SB9-100wnw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512323.283	552633.117	183.663
Soil Probe	Sb9-100wsw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512312.747	552628.741	183.655
Soil Probe	SB9-125nw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512337.880	552636.568	183.62
Soil Probe	SB9-125wnw	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512339.339	552647.862	183.621
Soil Probe	SB13	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512270.050	552655.764	183.219
Soil Probe	SB13 40ne	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	25	0.6	0.800		4512281.730	552663.705	182.877
Soil Probe	SB13 40nw	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	24	0.6	0.800		4512280.347	552645.058	182.111
Soil Probe	SB13 40w	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	25	0.6	0.800		4512273.015	552643.993	182.603
Soil Probe	SB13 60w	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	23	0.6	0.800		4512274.710	552636.727	182.575
Soil Probe	SB13-20e	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512269.788	552661.007	183.232
Soil Probe	SB13-20n	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512275.447	552656.892	183.219
Soil Probe	SB13-20s	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512265.098	552654.321	183.157
Soil Probe	SB13-20w	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512271.132	552650.555	183.167
Soil Probe	SB14	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.900		4512257.423	552669.522	183.329
Soil Probe	SB14 40sw	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	25	0.6	0.800		4512244.798	552663.297	182.571
Soil Probe	SB14 40w	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	24	0.6	0.800		4512251.108	552658.056	182.856
Soil Probe	SB14-20e	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	29	0.5	0.900		4512255.670	552674.624	183.44

GPS Data Table

Site/Facility Name: **Former Exide Factory**
Site Location: **303 Water Street**
BCA Project ID: **23-227**
IDEM Site/Facility ID:
OLQ Program: **IBP**
Purpose of Data Collection: Supplemental Phase II Investigation

Data Collector Name: Dan Rust
Data Processor Name: David Scovel, LPG

Projection: UTM Zone 16N
Datum: NAD 83 (CORS96)
Units: Meters
GPS Reciever Brand/Model: Geode 351441
Reciever Type: Survey Grade DGPS

Point Type	Name	Depth Feet	Refusal (Bedrock)	Groundwater Obtained	Description/Notes	Max PDOP	Correction Method	Instrument	Date	Total Positions	Vert Precision (meters)	Horiz Precision (meters)	Standard Deviation	Easting meters	Northing meters	Elevation meters
Soil Probe	SB14-20n	5	No	No		0.9	ThreeDimensional DGPS	Geode 351441	2023-08-23T	32	0.5	0.800		4512261.946	552670.338	184.021
Soil Probe	SB14-20s	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512251.148	552668.807	183.247
Soil Probe	SB14-20w	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.900		4512258.427	552663.249	183.256
Soil Probe	SB30	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512277.811	552600.301	183.12
Soil Probe	SB30-20e	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.900		4512277.336	552605.256	183.05
Soil Probe	SB30-20n	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512282.854	552600.476	183.089
Soil Probe	SB30-20s	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512275.413	552600.284	183.032
Soil Probe	SB30-20w	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512277.706	552594.829	183.052
Soil Probe	SB44	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.800		4512278.142	552786.117	183.422
Soil Probe	SB44 40nw	1	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	24	0.6	0.900		4512285.421	552776.730	182.929
Soil Probe	SB44 40s	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	24	0.6	0.800		4512264.587	552784.529	183.356
Soil Probe	SB44 40se	1	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-28T	25	0.6	0.800		4512266.960	552791.788	183.306
Soil Probe	SB44 40sw	1	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	23	0.6	0.900		4512267.703	552777.899	183.424
Soil Probe	SB44 40w	1	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	23	0.6	0.900		4512279.969	552773.066	182.967
Soil Probe	SB44 60w	1	No	No		1.1	ThreeDimensional DGPS	Geode 351441	2023-08-28T	23	0.6	0.900		4512281.422	552764.868	182.932
Soil Probe	SB44-20e	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	29	0.5	0.900		4512277.579	552790.841	183.366
Soil Probe	SB44-20n	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	31	0.5	0.800		4512283.639	552787.208	183.136
Soil Probe	SB44-20s	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	30	0.5	0.800		4512272.631	552784.705	183.575
Soil Probe	Sb44-20w	5	No	No		1.0	ThreeDimensional DGPS	Geode 351441	2023-08-23T	29	0.5	0.900		4512278.781	552780.636	183.275

NAD83 (CORS96)
Horizontal
Continuously Operating Reference Stations Readjustment of NAD 83

Appendix F

Groundwater Sampling Logs

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

Groundwater Sampling Logs

Site Name:	Former Exide Corp.
Site Address:	303 Water Street Logansport, Indiana
BCA Project Number:	20-252, 22-104
IDEM Site Number:	State Site Cleanup - 0000971 / IBP #4221108
Sampled By:	Cam Schipp, Jake Allgood, Christopher Jones
Sampling Equipment:	Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ AquaTROLL 500 Sonde
	*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
	ft			Deg F		mS/cm	mg/L		mV						
SB-GW-6	9.20	150 mL/min	13:50							12/9/2020	14.82	4.82	10.00	12.32	VOCs, PAHs (+DUP), Metals (+DUP), F.
	9.19		13:53	61.61		0.851	2.61	7.27	-100.3						Metals, CrVI (+DUP)
	9.19		13:56	59.06		0.945	1.29	7.02	-114.3						Slightly Cloudy / Odorless
	9.19		13:59	58.69		0.940	1.36	6.93	-115.9						Too Cloudy for Turbidity
	9.19		14:02	58.61		0.937	1.30	6.88	-118.3						
			14:05	58.59		0.933	1.13	6.86	-118.7	Sampled					
SB-GW-7	9.64	100 mL/min	12:23							12/9/2020	14.41	4.41	10.00	13.41	VOCs, PAHs, Metals, F. Metals, CrVI
			12:26	56.25		0.973	3.24	7.35	-120.2						Cloudy / Odorless
			12:29	55.92		0.975	4.54	7.34	-94.3						Too Cloudy for Turbidity
			12:32	56.16		0.818	5.76	7.35	-68.8						DTW Below Pump
			12:35	56.17		0.974	6.26	7.37	-58.6						Only 2 VOC/PAH VOAs
			12:38	57.07		0.965	4.75	7.32	-98.3						Stability Not Achieved
			12:41	57.39		0.955	4.37	7.32	-90.1						
			12:44	58.20		1.009	4.95	7.31	-72.0						
			12:47	58.28		0.943	5.37	7.32	-63.9	Sampled					
SB-GW-8	6.63	150 mL/min	14:34							12/9/2020	14.69	4.69	10.00	12.19	VOCs (+DUP), PAHs, Metals, F. Metals,
	5.68		14:37	58.70		2.352	0.82	7.00	-76.1						CrVI (+MS/MSD)
	5.68		14:40	58.86		2.364	0.86	6.91	-69.8						Slightly Cloudy / Odorless
	5.68		14:43	58.65		2.367	0.85	6.88	-67.9						Too Cloudy for Turbidity
	5.68		14:46	58.48		2.368	0.88	6.86	-66.7	Sampled					
SB-GW-9	8.60	150 mL/min	15:16							12/9/2020	19.74	9.74	10.00	17.24	VOCs, PAHs, Metals, F. Metals, CrVI
	8.95		15:19	59.26		1.719	1.50	7.93	-167.1						Cloudy / Odorless
	8.96		15:22	59.50		1.942	1.01	7.41	-134.4						Too Cloudy for Turbidity
	8.96		15:25	59.66		2.021	1.05	7.10	-113.9						
	8.96		15:28	59.51		2.090	1.08	6.95	-104.5						
	8.96		15:31	59.54		2.126	0.96	6.88	-99.4						
	8.96		15:34	59.59		2.149	0.91	6.84	-97.1						
	8.96		15:37	59.67		2.161	0.82	6.82	-95.2						
	8.96		15:40	59.51		2.159	0.77	6.80	-93.8	Sampled					
SB-GW-10	9.06	150 mL/min	16:02							12/9/2020	14.79	4.79	10.00	12.29	VOCs, PAHs, Metals, F. Metals, CrVI
	9.91		16:05	58.29		0.934	0.86	7.24	-148.5						Slightly Cloudy / Odorless
	10.02		16:08	58.86		0.924	0.40	7.17	-167.3						Too Cloudy for Turbidity
	10.01		16:11	58.94		0.916	0.37	7.12	-178.8						
	10.01		16:14	59.11		0.911	0.32	7.09	-187.2						
	10.01		16:17	59.16		0.905	0.29	7.08	-194.8	Sampled					

Groundwater Sampling Logs

Site Name:	Former Exide Corp.
Site Address:	303 Water Street Logansport, Indiana
BCA Project Number:	20-252, 22-104
IDEM Site Number:	State Site Cleanup - 0000971 / IBP #4221108
Sampled By:	Cam Schipp, Jake Allgood, Christopher Jones
Sampling Equipment:	Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ AquaTROLL 500 Sonde
	*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
SB-GW-11	8.60	150 mL/min	17:26							12/9/2020	13.30	3.30	10.00	10.80	VOCs, PAHs, Metals, F. Metals
	8.58		17:29	52.20		1.564	2.04	6.94	-88.0						Cloudy / Odorless
	8.58		17:32	53.20		1.627	1.98	6.79	-54.8						Too Cloudy for Turbidity
	8.58		17:35	53.53		1.644	1.82	6.72	-31.5						
	8.58		17:38	53.61		1.649	1.72	6.69	-20.8						
	8.58		17:41	53.61		1.647	1.63	6.67	-11.1						
	8.58		17:44	53.59		1.651	1.55	6.66	-6.5						
	8.58		17:47	53.49		1.652	1.44	6.66	-2.1	Sampled					
SB-GW-12	6.70	150 mL/min	16:41							12/9/2020	14.45	4.45	10.00	11.95	VOCs, PAHs, Metals, F. Metals, CrVI
	8.52		16:44	55.34		1.291	3.13	7.14	-104.1						Slightly Cloudy / Odorless
	8.70		16:47	55.36		1.320	2.53	7.09	-109.5						
	8.70		16:50	55.11		1.354	1.80	7.03	-118.5						
	8.70		16:53	55.10	818	1.349	1.60	7.01	-121.4						
	8.70		16:56	55.03	520	1.353	1.40	6.98	-122.6						
	8.70		16:59	55.02	408	1.353	1.24	6.97	-122.4	Sampled					
SB-GW-15	11.23	100 mL/min	11:28							12/9/2020	14.82	4.82	10.00	12.82	VOCs, PAHs, Metals, F. Metals, CrVI
	11.38		11:31	52.70		0.940	2.21	7.32	-46.6						Cloudy / Odorless
	11.38		11:34	53.12		0.891	1.37	7.21	-64.9						Too Cloudy for Turbidity
	11.38		11:37	53.28		0.884	1.18	7.14	-60.4						
	11.38		11:40	53.44		0.879	1.12	7.09	-52.5						
	11.38		11:43	53.34		0.877	1.10	7.06	-46.9						
	11.38		11:46	53.94		0.878	1.09	7.04	-42.7	Sampled					
SB-GW-16	6.90	150 mL/min	10:12							12/9/2020	14.83	4.83	10.00	12.33	VOCs, PAHs, Metals (+MS/MSD), F.
	7.23		10:15	51.19		2.152	1.52	11.59	-21.2						Metals, CrVI
	7.30		10:18	53.28		2.186	1.33	11.61	-12.1						Clear / Odorless
	7.34		10:21	53.54		1.875	1.16	10.56	11.7						
	7.34		10:24	53.69	777	1.941	1.01	9.36	20.9						
	7.34		10:27	53.70	573	2.038	0.84	8.85	-39.5						
	7.34		10:30	53.78	413	2.129	0.80	8.43	-146.7						
	7.34		10:33	53.96	341	2.203	0.75	7.97	-100.5						
	7.34		10:36	53.78	302	2.244	0.64	7.64	-65.4						
	7.34		10:39	53.81	344	2.268	0.58	7.43	-51.9						
	7.34		10:42	53.95	300	2.274	0.59	7.32	-46.8						
	7.34		10:45	54.03	302	2.300	0.53	7.19	-39.2	Sampled					
SB-GW-17	5.15	100 mL/min	8:37							12/9/2020	14.73	4.73	10.00	12.23	VOCs, PAHs, Metals, F. Metals, CrVI
	7.43		8:40	51.12		0.899	2.48	7.53	-131.0						Cloudy / Odorless
	8.26		8:43	50.77		0.884	2.52	7.50	-127.9						Too Cloudy for Turbidity
	9.92		8:46	51.10		0.894	2.32	7.47	-137.1						Final DTW Below Pump
	10.26		8:49	51.14		0.893	2.30	7.46	-138.8						Only 2 VOC/PAH VOAs
			8:52	51.45		0.894	1.45	7.41	-161.2	Sampled					

Groundwater Sampling Logs

Site Name:	Former Exide Corp.
Site Address:	303 Water Street Logansport, Indiana
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IDEM Site Number:	State Site Cleanup - 0000971 / IBP #4221108
Sampled By:	Cam Schipp, Jake Allgood, Christopher Jones
Sampling Equipment:	Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ AquaTROLL 500 Sonde
	*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
SB-GW-18	6.28	150 mL/min	13:49							12/8/2020	14.75	4.75	10.00	12.25	VOCs, PAHs, Metals, F. Metals, CrVI
	6.95		13:52	53.94		1.203	0.90	7.28	-163.7						Slightly Cloudy / Odorless
	6.95		13:55	55.02		1.205	0.90	7.19	-144.1						
	6.87		13:58	55.03		1.202	1.15	7.14	-123.1						
	6.83		14:01	55.02		1.204	1.20	7.12	-110.3						
	6.83		14:04	55.33	745	1.206	1.09	7.10	-108.6						
	6.83		14:07	55.51	494	1.204	1.05	7.08	-105.2						
	6.83		14:10	55.61	334	1.203	1.09	7.07	-101.1	Sampled					
SB-GW-19	5.52	150 mL/min	14:46							12/8/2020	14.79	4.79	10.00	12.29	VOCs (+MS/MSD), PAHs (+MS/MSD),
	5.56		14:49	55.17		1.284	0.39	7.21	-156.0						Metals, F. Metals, CrVI
	5.55		14:52	56.33		1.292	0.31	7.16	-177.9						Clear / Odorless
	5.55		14:55	56.82		1.313	0.28	7.11	-170.6						
	5.55		14:58	56.98	489	1.325	0.27	7.08	-156.3						
	5.55		15:01	56.66		1.332	0.25	7.06	-142.8						
	5.55		15:04	56.82	205	1.336	0.23	7.03	-126.0						
	5.55		15:07	56.86	150	1.342	0.23	7.02	-116.8						
	5.55		15:10	56.80	115	1.338	0.22	7.02	-108.7						
	5.55		15:13	57.04	108	1.341	0.22	7.01	-103.2	Sampled					
SB-GW-20	7.21	100 mL/min	15:49							12/8/2020	14.28	4.28	10.00	11.78	VOCs, PAHs, Metals, F. Metals, CrVI
	10.13		15:52	53.36		0.986	2.30	7.35	-68.9						Cloudy / Odorless
	9.90		15:55	52.12		0.973	2.47	7.34	-58.9						Too Cloudy for Turbidity
	10.39		15:58	53.07		0.982	1.17	7.24	-68.7						
	10.02		16:01	52.68		0.969	1.04	7.22	-67.7						
	9.86		16:04	51.20		0.975	1.08	7.21	-66.0						
	9.82		16:07	50.77		0.976	1.08	7.18	-58.9						
	9.80		16:10	50.46		0.976	1.16	7.16	-54.1						
	9.89		16:13	52.37		0.977	1.24	7.14	-50.9						
	9.92		16:16	52.11		0.975	1.33	7.14	-53.1	Sampled					
MW-1	6.60	200 mL/min	12:07	48.23	332.73	1.207	8.64	7.78	5.0	4/1/2022	16.18	11.18	5.00	14.18	
	8.81	200 mL/min	12:10	48.43	274.53	1.196	6.85	7.74	-10.9						Metals @ 1237
	10.05	200 mL/min	12:13	48.51	224.78	1.199	6.28	7.73	-12.8						Clear / odorless
	11.00	200 mL/min	12:16	48.66	416.28	1.202	5.91	7.72	-19.9						
	12.00	120 mL/min	12:19	49.08	1722.9	1.208	4.62	7.69	-22.5						
	12.90	120 mL/min	12:22	50.21	690.01	1.210	6.55	7.76	-42.2						
	13.60	120 mL/min	12:25	50.13	761.33	1.227	5.72	7.78	-41.9						
	14.30	120 mL/min	12:28	50.41	800.97	1.230	5.41	7.82	-53.9						
	14.70	100 mL/min	12:31	50.40	877.65	1.216	5.24	7.84	-62.6						
	14.81	100 mL/min	12:34	50.30	365.43	1.215	5.67	7.84	-58.8						
	15.10	100 mL/min	12:37	50.23	748.92	1.208	5.21	7.85	-61.1	Sampled					

Groundwater Sampling Logs

Site Name:	Former Exide Corp.
Site Address:	303 Water Street Logansport, Indiana
BCA Project Number:	20-252, 22-104
IDEM Site Number:	State Site Cleanup - 0000971 / IBP #4221108
Sampled By:	Cam Schipp, Jake Allgood, Christopher Jones
Sampling Equipment:	Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ AquaTROLL 500 Sonde
	*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
MW-2	6.64	200 mL/min	11:28	45.74	1522.3	1.287	11.50	7.77	6.0	4/1/2022	14.30	9.30	5.00	14.18	Metals @ 1146
	6.64	200 mL/min	11:31	48.31	716.6	1.410	1.70	7.62	-50.3						Clear / Odorless
	6.64	200 mL/min	11:34	48.51	458.28	1.382	1.40	7.58	-58.7						
	6.64	200 mL/min	11:37	48.65	342.68	1.371	1.19	7.57	-64.9						
	6.64	200 mL/min	11:40	48.70	312.65	1.361	1.01	7.56	-70.2						
	6.64	200 mL/min	11:43	48.78	209.61	1.357	0.90	7.55	-74.2						
	6.64	200 mL/min	11:46	48.59	219.76	1.364	0.79	7.55	-77.5	Sampled					
MW-3	9.30	150 mL/min	10:32	48.31	3517.80	1.661	3.68	7.66	-41.9	4/1/2022	14.95	9.95	5.00	14.18	Metals @ 1050
	9.30	150 mL/min	10:35	49.12	1277.10	1.695	1.51	7.60	-67.8						+MS/MSD
	9.30	150 mL/min	10:38	49.06	762.12	1.732	1.28	7.56	-74.6						Clear / Odorless
	9.30	150 mL/min	10:41	49.18	433.41	1.761	1.17	7.54	-76.4						
	9.30	150 mL/min	10:44	48.91	294.66	1.746	1.04	7.54	-80.4						
	9.30	150 mL/min	10:47	49.23	269.82	1.755	0.92	7.54	-81.0						
	9.30	150 mL/min	10:50	49.61	198.99	1.750	0.79	7.52	-81.3	Sampled					
MW-4	5.37	200 mL/min	13:05	50.64	689.75	1.403	4.43	7.62	-60.2	4/1/2022	13.00	8.00	5.00	14.18	Metals @ 1050
	5.37	200 mL/min	13:08	49.81	264.2	1.439	2.56	7.59	-71.0						+DUP
	5.37	200 mL/min	13:11	50.08	214.22	1.442	2.40	7.61	-72.0						Clear / Odorless
	5.37	200 mL/min	13:14	50.03	80.75	1.446	2.31	7.64	-70.7						
	5.37	200 mL/min	13:17	50.08	73.97	1.449	2.32	7.67	-66.8						
	5.37	200 mL/min	13:20	50.14	53.98	1.449	2.27	7.70	-63.6	Sampled					
MW-5	7.71	150 mL/min	9:24	45.09	4719.90	1.110	1.44	7.88	-85.4	4/1/2022	11.80	6.80	5.00	14.18	Metals @ 0954
	7.71		9:27	46.10	3453.90	1.114	1.07	7.82	-103.6						VOCs @ 0954
	7.71		9:30	46.22	2436.20	1.112	1.00	7.77	-110.0						Clear / Odorless
	7.71		9:33	46.55	1817.6	1.114	0.91	7.72	-113.3						
	7.71		9:36	46.93	887.05	1.112	0.73	7.63	-112.9						
	7.71		9:39	46.73	613.11	1.111	0.65	7.56	-109.8						
	7.71		9:42	46.43	306.85	1.111	0.53	7.50	-108.6						
	7.71		9:45	46.67	214.38	1.113	0.48	7.45	-104.9						
	7.71		9:48	46.94	207.29	1.113	0.45	7.42	-104.5						
	7.71		9:51	46.86	199.46	1.113	0.41	7.41	-105.4						
	7.71		9:54	46.84	150.53	1.113	0.36	7.41	-107.2	Sampled					

Groundwater Sampling Logs

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Sampled By:	Cam Schipp, Jake Allgood, Christopher Jones
Sampling Equipment:	Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ AquaTROLL 500 Sonde
	*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
SB-GW-21	8.70	150 mL/min	11:56	44.51	3793.5	1.059	6.93	7.94	106.3	3/31/2022	12.50	7.50	5.00	14.18	VOCs @ 1226
	8.70		11:59	45.15	6642.4	1.086	5.16	7.88	102.6						Clear / Odorless
	8.70		12:02	45.57	2278.8	1.101	4.20	7.83	98.7						
	8.70		12:05	45.83	874.38	1.108	3.34	7.80	95.9						
	8.70		12:08	46.30	563.69	1.114	2.75	7.78	93.7						
	8.70		12:11	46.92	816.74	1.119	3.04	7.77	91.4						
	8.70		12:14	47.38	462.51	1.121	2.43	7.76	88.6						
	8.70		12:17	47.63	374.77	1.119	2.23	7.76	86.5						
	8.70		12:20	47.77	207.31	1.122	1.94	7.75	84.5						
	8.70		12:23	47.80	140.38	1.123	1.82	7.75	82.3						
	8.70		12:26	48.18	145.35	1.124	1.53	7.74	80.5	Sampled					
SB-GW-22	8.80	150 mL/min	12:53	46.97	6118.1	0.991	2.77	7.79	-90.1	3/31/2022	12.60	7.60	5.00	14.18	VOCs @ 1323
	8.80		12:56	47.61	4956.1	1.014	1.07	7.78	-94.6						Clear / Odorless
	8.80		12:59	48.26	2352.2	1.031	0.97	7.77	-94.6						
	8.80		13:02	48.48	1314.4	1.042	0.90	7.77	-94.1						
	8.80		13:05	48.51	657.92	1.047	0.85	7.77	-93.2						
	8.80		13:08	48.64	430.60	1.049	0.82	7.76	-93.2						
	8.80		13:11	49.04	324.51	1.050	0.77	7.76	-93.2						
	8.80		13:14	49.11	216.33	1.052	0.71	7.76	-93.3						
	8.80		13:17	49.07	207.38	1.052	0.61	7.75	-93.9						
	8.80		13:20	49.06	205.38	1.052	0.58	7.75	-94.3						
	8.80		13:23	48.72	120.76	1.052	0.51	7.75	-94.2	Sampled					
SB-GW-23	9.20	150 mL/min	10:20	48.67	2550.8	0.096	1.89	7.98	75.2	3/31/2022	12.60	7.60	5.00	14.18	VOCs @ 1038
	9.20		10:23	49.39	4950.50	0.952	1.29	7.90	68.4						+DUP
	9.20		10:26	49.89	1258.10	0.954	1.17	7.89	66.3						Clear / Odorless
	9.20		10:29	49.99	626.82	0.953	1.08	7.88	64.8						
	9.20		10:32	50.03	406.64	0.952	0.98	7.88	63.9						
	9.20		10:35	50.15	323.42	0.952	0.91	7.87	62.9						
	9.20		10:38	49.89	219.04	0.951	0.83	7.87	62.4	Sampled					
SB-GW-24	8.50	150 mL/min	15:32	49.76	28.57	0.559	1.19	11.03	-46.7	3/31/2022	13.19	8.19	5.00	14.18	VOCs @ 1602
	8.50		15:35	50.51	821.53	0.998	0.28	8.73	-74.8						Clear / Odorless
	8.50		15:38	50.43	5778.6	1.188	0.19	7.84	-54.9						
	8.50		15:41	50.42	6130.5	1.205	0.23	7.73	-50.3						
	8.50		15:44	50.64	5840.3	1.217	0.21	7.69	-46.7						
	8.50		15:47	50.76	5255.1	1.229	0.20	7.66	-44.9						
	8.50		15:50	50.90	4768.60	1.238	0.17	7.64	-42.1						
	8.50		15:53	50.63	3597.60	1.244	0.16	7.62	-39.3						
	8.50		15:56	50.58	3670.70	1.244	0.16	7.61	-37.4						
	8.50		15:59	50.09	3022.10	1.246	0.16	7.61	-36.4						
	8.50		16:02	50.13	2571.10	1.247	0.17	7.61	-36.4	Sampled					

Groundwater Sampling Logs

Site Name: Former Exide Corp.
Site Address: 303 Water Street Logansport, Indiana
BCA Project Number: 20-252, 22-104
IDEM Site Number: State Site Cleanup - 0000971 / IBP #4221108
Sampled By: Cam Schipp, Jake Allgood, Christopher Jones
Sampling Equipment: Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ AquaTROLL 500 Sonde
*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
SB-GW-25	9.84	150 mL/min	9:06	48.98	1961.7	0.865	4.71	8.08	71.1	3/31/2022	13.40	8.40	5.00	14.18	VOCs @ 0934
	9.05		9:09	48.60	2688.5	0.894	2.68	8.03	41.3						+MS/MSD
	9.05		9:12	48.64	5221.10	0.906	1.95	8.05	21.5						Clear / Odorless
	9.05		9:15	48.94	6009.6	0.910	1.36	7.99	11.4						
	9.05		9:18	48.94	6307.80	0.909	1.00	8.01	5.5						
	9.05		9:21	48.89	6117.2	0.910	0.82	8.00	1.6						
	9.05		9:24	48.95	5468.1	0.910	0.72	7.98	-0.5						
	9.05		9:27	48.62	4370.7	0.908	0.69	7.98	-0.7						
	9.05		9:30	48.72	2514.7	0.908	0.65	7.97	-0.1						
	9.05		9:33	48.71	1599.7	0.906	0.63	7.97	0.3						
			9:34							Sampled					
SB-GW-26	6.80	150 mL/min	13:58	49.03	5531.30	1.190	3.49	7.88	-59.1	3/31/2022	19.70	14.70	5.00	14.18	VOCs @ 1428
	6.80		14:01	50.49	4110.50	1.194	0.88	7.87	-87.8						Clear / Odorless
	6.80		14:04	51.49	6217.20	1.199	0.79	7.86	-100.6						
	6.80		14:07	51.95	6452.80	1.207	0.72	7.86	-105.6						
	6.80		14:10	51.60	6287.90	1.209	0.72	7.85	-108.2						
	6.80		14:13	52.12	5066.40	1.212	0.71	7.84	-109.9						
	6.80		14:16	52.27	3468.2	1.209	0.69	7.84	-110.8						
	6.80		14:19	51.51	2396	1.212	0.67	7.84	-111.8						
	6.80		14:22	51.72	1629.6	1.212	0.63	7.83	-112.9						
	6.80		14:25	51.85	1357.7	1.213	0.61	7.83	-114.0						
	6.80		14:28	51.65	1007.8	1.209	0.59	7.83	-116.8	Sampled					

Groundwater Sampling Logs

Site Name: Former Exide Corp.
Site Address: 303 Water Street Logansport, Indiana
BCA Project Number: 23-227
IDEM Site Number:
Sampled By: Dan Rust
Sampling Equipment: Geotech stainless steel .625 Bladder Pump - disposable poly dual tube - In-Situ SmarTROLL MP Sonde
*Dedicated disposable tubing in all wells

Sample Location	GW Starting Depth	Estimated Flow Rate	Pump Start Time	Temperature	Turbidity	Specific Conductivity	Dissolved Oxygen	pH	ORP	Sample Date	Total Well Depth	Top of Well Screen	Well Screen Length	Pump Intake Depth	Notes
	ft			Deg F		mS/cm	mg/L		mV						
HS-5	7.92	100.00	16:33	63.91	264.17	0.633	3.04	9.09	35.8	11/7/2023	10.40	5.40	5.00	10.15	Clear / odorless
	7.92		16:36	64.24	1637.26	0.581	1.71	9.58	-127.0						
	7.92		16:39	64.74	5258.68	0.541	1.31	9.81	-184.2						
	7.92		16:42	65.27	4281.82	0.526	1.02	9.34	-196.5						
	7.92		16:45	65.16	2176.13	0.553	0.86	9.13	-207.8						
	7.92		16:48	65.10	1683.21	0.598	0.79	8.88	-207.8						
	7.92		16:51	65.24	778.55	0.626	0.76	8.77	-211.2						
	7.92		16:54	65.18	602.71	0.657	0.73	8.59	-208.5						
	7.92		16:57	65.42	425.82	0.678	0.71	8.44	-205.4						
	7.92		17:00	65.03	340.05	0.697	0.70	8.30	-200.7						
	7.92		17:03	64.91	246.18	0.712	0.69	8.13	-196.4						
	7.92		17:06	64.76	298.86	0.728	0.68	7.95	-189.1						
	7.92		17:09	64.62	261.78	0.728	0.69	7.84	-185.9						
	7.92		17:12	64.62	207.23	0.728	0.68	7.72	-182.1						
	7.92		17:15	64.52	204.69	0.728	0.68	7.64	-180.5						
	7.92		17:18	64.30	229.51	0.728	0.68	7.57	-179.1	Sampled					
MW-5 (SB-7)	6.60	100.00	15:41	62.58	2074.63	0.837	0.48	6.92	-16.9	11/7/2023	10.10	5.10	5.00	9.85	Clear / odorless
	6.60		15:44	62.55	930.15	0.840	0.31	6.89	-25.3						
	6.60		15:47	62.52	485.60	0.840	0.24	6.87	-26.2						
	6.60		15:50	62.54	382.45	0.840	0.21	6.87	-26.4						
	6.60		15:53	62.57	234.98	0.841	0.18	6.87	-26.6						
	6.60		15:56	62.64	139.86	0.841	0.14	6.87	-26.2						
	6.60		15:59	62.68	82.25	0.841	0.12	6.87	-25.8						
	6.60		16:10	63.32	59.58	0.842	0.24	6.91	-23.4	Sampled					
HS1 - 10e	7.25	220.00	14:52	62.46	4594.43	0.696	1.90	7.37	-65.5	11/7/2023	9.64	4.64	5.00	9.39	Clear / odorless
	7.25		14:55	62.41	5402.38	0.678	0.65	7.31	-60.8						
	7.25		14:58	62.39	2417.45	0.675	0.30	7.27	-57.1						
	7.25		15:01	62.17	1761.99	0.675	0.22	7.25	-54.2						
	7.25		15:04	62.22	1426.20	0.675	0.21	7.25	-51.5						
	7.25		15:07	62.31	1150.48	0.676	0.20	7.22	-49.3						
	7.25		15:10	62.42	1283.30	0.677	0.19	7.21	-47.5						
	7.25		15:13	62.47	1066.91	0.677	0.18	7.21	0.2						
	7.25		15:16	62.39	666.21	0.677	0.19	7.20	-30.3	Sampled					
HS1 - 10w	7.25	100.00	14:07	63.91	679.36	0.899	0.58	6.94	7.0	11/7/2023	10.60	5.60	5.00	10.35	Clear / odorless
	7.25		14:10	63.81	364.28	0.901	0.41	6.93	-24.5						
	7.25		14:13	63.84	205.98	0.901	0.29	6.92	-37.0						
	7.25		14:16	63.64	131.83	0.901	0.26	6.92	-42.2						
	7.25		14:19	63.53	61.77	0.901	0.22	6.92	-47.4						
	7.25		14:22	63.45	47.78	0.902	0.19	6.91	-49.0						
	7.25		14:25	63.30	29.00	0.901	0.18	6.91	-51.2						
	7.25		14:28	63.03	20.06	0.902	0.16	6.91	-52.7	Sampled					

Appendix G

Figures, Tables, and XRF Data
from Previous Reports

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

High Limit 1500 87 = Number a
Average Limit 1000 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP30	20N	0-6 in	166	329	336	336	277	x	428	43%	
SP30	20N	6 - 12 in	153	192	202	202	182	x	173	5%	
SP30	20N	12 - 18 in	398	631	904	904	644	x	527	20%	
SP30	20N	18 - 24 in	<20	<20	<20	0	0				
SP30	20N	2 - 3 ft	33	<20	<20	33	33				
SP30	20N	3 - 4 ft	<20	<20	<20	0	0				
SP30	20N	4 - 5 ft	63	266	292	292	207				
SP30	20S	0-6 in	353	380	705	705	479	x	338	35%	
SP30	20S	6 - 12 in	676	569	477	676	574	x	417	32%	
SP30	20S	12 - 18 in	412	446	295	446	384	x	435	12%	
SP30	20S	18 - 24 in	44	32	47	47	41	x	67.9	49%	
SP30	20S	2 - 3 ft	50	25	22	50	32				
SP30	20S	3 - 4 ft	<20	<20	<20	0	0				
SP30	20S	4 - 5 ft	<20	<20	<20	0	0				
SP30	20E	0-6 in	137	254	181	254	191	x	192	1%	
SP30	20E	6 - 12 in	781	653	128	781	521	x	626	18%	
SP30	20E	12 - 18 in	452	427	663	663	514	x	386	28%	
SP30	20E	18 - 24 in	<20	48	<20	48	48	x	19.1	86%	
SP30	20E	2 - 3 ft	29	25	34	34	29				
SP30	20E	3 - 4 ft	<20	<20	<20	0	0				
SP30	20E	4 - 5 ft	<20	<20	<20	0	0				
SP30	20W	0-6 in	128	147	182	182	152	x	133	14%	
SP30	20W	6 - 12 in	474	135	138	474	249	x	421	51%	
SP30	20W	12 - 18 in	529	344	328	529	400	x	322	22%	
SP30	20W	18 - 24 in	84	199	205	205	163				
SP30	20W	2 - 3 ft	<20	<20	24	24	24				
SP30	20W	3 - 4 ft	<20	<20	<20	0	0				
SP30	20W	4 - 5 ft	<20	<20	<20	0	0				
SP13	20N	0-6 in	567	1070	1279	1279	972	x	421	79%	
SP13	20N	6 - 12 in	368	1083	595	1083	682	x	444	42%	
SP13	20N	12 - 18 in	64	307	429	429	267	x	571	73%	
SP13	20N	18 - 24 in	<20	22	<20	22	22	x	7.5	98%	
SP13	20N	2 - 3 ft	24	<20	<20	24	24				
SP13	20N	3 - 4 ft	<20	<20	<20	0	0				
SP13	20N	4 - 5 ft	<20	<20	<20	0	0				
SP13	20S	0-6 in	124	840	758	840	574	x	587	2%	
SP13	20S	6 - 12 in	322	384	351	384	352	x	353	0%	
SP13	20S	12 - 18 in	93	139	214	214	149	x	106	34%	
SP13	20S	18 - 24 in	<20	<20	<20	0	0				
SP13	20S	2 - 3 ft	<20	<20	<20	0	0				
SP13	20S	3 - 4 ft	<20	<20	<20	0	0				
SP13	20S	4 - 5 ft	<20	<20	<20	0	0				
SP13	20E	0-6 in	537	493	733	733	588	x	571	3%	
SP13	20E	6 - 12 in	165	285	556	556	335	x	358	7%	
SP13	20E	12 - 18 in	264	1893	373	**1893**	843	x	554	41%	
SP13	20E	18 - 24 in	377	334	274	377	328	x	317	4%	
SP13	20E	2 - 3 ft	39	50	38	50	42	x	38.2	10%	
SP13	20E	3 - 4 ft	<20	<20	<20	0	0				
SP13	20E	4 - 5 ft	<20	<20	<20	0	0				
SP13	20W	0-6 in	1374	1377	1532	**1532**	**1428**	x	1460	2%	0.42
SP13	20W	6 - 12 in	511	646	544	646	567	x	482	16%	
SP13	20W	12 - 18 in	493	348	134	493	325	x	342	5%	
SP13	20W	18 - 24 in	<20	21	<20	21	21	x	28.1	29%	
SP13	20W	2 - 3 ft	<20	<20	<20	0	0				
SP13	20W	3 - 4 ft	<20	<20	<20	0	0				
SP13	20W	4 - 5 ft	<20	<20	<20	0	0				

EXIDE Soil

XRF results / Laboratory Results / TCLP Results

High Limit 1500   87 = Number a

Average Limit 1000   83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP14	20N	0-6 in	332	68	1378	1378	593	x	659	11%	
SP14	20N	6 - 12 in	85	338	83	338	169	x	223	28%	
SP14	20N	12 - 18 in	176	70	184	184	143	x	180	23%	
SP14	20N	18 - 24 in	55	119	102	119	92				
SP14	20N	2 - 3 ft	78	88	116	116	94				
SP14	20N	3 - 4 ft	120	1129	198	1129	482	x	677	34%	
SP14	20N	4 - 5 ft	48	52	59	59	53	x	48.4	9%	
SP14	20S	0-6 in	546	136	556	556	413	x	501	19%	
SP14	20S	6 - 12 in	701	885	276	885	621	x	719	15%	
SP14	20S	12 - 18 in	56	84	97	97	79	x	171	74%	
SP14	20S	18 - 24 in	72	32	37	72	47	x	61.8	27%	
SP14	20S	2 - 3 ft	<20	<20	<20	0	0				
SP14	20S	3 - 4 ft	<20	<20	<20	0	0				
SP14	20S	4 - 5 ft	<20	<20	<20	0	0				
SP14	20E	0-6 in	144	202	272	272	206	x	151	31%	
SP14	20E	6 - 12 in	234	113	107	234	151	x	162	7%	
SP14	20E	12 - 18 in	56	96	72	96	75				
SP14	20E	18 - 24 in	76	109	111	111	99				
SP14	20E	2 - 3 ft	30	275	166	275	157	x	110	35%	
SP14	20E	3 - 4 ft	<20	<20	<20	0	0				
SP14	20E	4 - 5 ft	<20	<20	<20	0	0				
SP14	20W	0-6 in	865	1826	1666	**1826**	**1452**	x	1050	32%	
SP14	20W	6 - 12 in	174	288	350	350	271	x	697	88%	
SP14	20W	12 - 18 in	114	145	122	145	127	x	97.5	26%	
SP14	20W	18 - 24 in	52	170	37	170	86				
SP14	20W	2 - 3 ft	<20	<20	<20	0	0				
SP14	20W	3 - 4 ft	<20	<20	<20	0	0				
SP14	20W	4 - 5 ft	<20	<20	<20	0	0				
SP44	20N	0-6 in	1040	540	230	1040	603	x	557	8%	
SP44	20N	6 - 12 in	108	135	60	135	101	x	51.6	65%	
SP44	20N	12 - 18 in	20	58	86	86	55	x	1490	186%	
SP44	20N	18 - 24 in	497	625	190	625	437	x	1870	124%	
SP44	20N	2 - 3 ft	<20	28	<20	28	28				
SP44	20N	3 - 4 ft	<20	<20	<20	0	0				
SP44	20N	4 - 5 ft	<20	<20	<20	0	0				
SP44	20S	0-6 in	200	763	1347	1347	770	x	1060	32%	
SP44	20S	6 - 12 in	1741	469	3264	**3264**	**1825**	x	841	74%	
SP44	20S	6 - 12 in		duplicate				x	1940		
SP44	20S	12 - 18 in	834	751	409	834	665	x	653	2%	
SP44	20S	18 - 24 in	87	20	160	160	89				
SP44	20S	2 - 3 ft	<20	<20	<20	0	0				
SP44	20S	3 - 4 ft	<20	<20	<20	0	0				
SP44	20S	4 - 5 ft	<20	<20	<20	0	0				
SP44	20E	0-6 in	1098	1013	1429	1429	**1180**	x	1230	4%	0.92
SP44	20E	6 - 12 in	198	<20	32	198	115	x	90.7	24%	
SP44	20E	12 - 18 in	<20	<20	<20	0	0	x	8.9		
SP44	20E	18 - 24 in	<20	<20	<20	0	0				
SP44	20E	2 - 3 ft	<20	<20	<20	0	0				
SP44	20E	3 - 4 ft	<20	<20	<20	0	0				
SP44	20E	4 - 5 ft	<20	<20	<20	0	0				

EXIDE Soil

XRF results / Labratory Results / TCLP Results

								High Limit	1500		87 = Number a
			XRF Results			XRF Results		Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP44	20W	0-6 in	4953	4212	3381	**4953**	**4182**	x	4850	15%	40.7
SP44	20W	6 - 12 in	821	348	781	821	650	x	598	8%	
SP44	20W	12 - 18 in	129	115	90	129	111	x	108	3%	
SP44	20W	18 - 24 in	<20	<20	23	23	23				
SP44	20W	2 - 3 ft	60	<20	56	60	58				
SP44	20W	3 - 4 ft	<20	<20	36	36	36				
SP44	20W	4 - 5 ft	<20	<20	<20	0	0				
SP7	20S	0-6 in	2656	2229	4722	**4722**	**3202**	x	2710	17%	
SP7	20S	6 - 12 in	682	631	1736	**1736**	**1016**	x	915	10%	
SP7	20S	6 - 12 in	duplicate					x	2370		
SP7	20S	12 - 18 in	380	201	293	380	291	x	381	27%	
SP7	20S	18 - 24 in	81	263	76	263	140				
SP7	20S	2 - 3 ft	76	<20	<20	76	76	x	50.3	41%	
SP7	20S	3 - 4 ft	<20	28	<20	28	28				
SP7	20S	4 - 5 ft	<20	<20	<20	0	0				
SP7	20W	0-6 in	1406	2930	2252	**2930**	**2196**	x	3010	31%	
SP7	20W	6 - 12 in	505	1206	384	1206	698	x	1010	36%	0.61
SP7	20W	12 - 18 in	974	676	956	974	869	x	222	119%	
SP7	20W	18 - 24 in	320	341	301	341	321	x	474	39%	
SP7	20W	2 - 3 ft	27	<20	<20	27	27				
SP7	20W	3 - 4 ft	<20	<20	<20	0	0				
SP7	20W	4 - 5 ft	<20	<20	<20	0	0				
HS1	20S	0 - 1 ft	2264	5550	804	**5550**	**2873**	x	2640	8%	
HS1	20S	1 - 2 ft	228	243	111	243	194	x	284	38%	
HS1	20S	2 - 3 ft	<20	30	<20	30	30				
HS1	20S	3 - 4 ft	340	115	222	340	226				
HS1	20S	4 - 5 ft	<20	<20	<20	0	0				
HS1	20E	0 - 1 ft	8531	12000	6572	**12000**	**9034**	x	46900	135%	63.3
HS1	20E	1 - 2 ft	1222	2523	2024	**2523**	**1923**	x	3520	59%	
HS1	20E	2 - 3 ft	317	406	336	406	353				
HS1	20E	3 - 4 ft	<20	<20	<20	0	0				
HS1	20E	4 - 5 ft	<20	29	<20	29	29				
HS1	20W	0 - 1 ft	185	350	184	350	240				
HS1	20W	1 - 2 ft	418	920	776	920	705	x	474	39%	
HS1	20W	2 - 3 ft	<20	29	41	41	35				
HS1	20W	3 - 4 ft	<20	<20	<20	0	0				
HS1	20W	4 - 5 ft	<20	<20	<20	0	0				
SP44	W 60-1	0-6 in	300	996	367	996	554	x	391	35%	
SP44	S 40-1	0-6 in	158	286	134	286	193	x	126	42%	
SP44	S 40-1	6 - 12 in						x	121		
SP44	S 40-2	0-6 in	147	146	185	185	159	x	147	8%	
SP44	S 40-2	6 - 12 in						x	86.1		
SP44	S 40-3	0-6 in	187	189	247	247	208	x	102	68%	
SP44	S 40-3	6 - 12 in						x	96.5		
SP44	W 40-1	0-6 in	1591	3125	1229	**3125**	**1982**	x	1490	28%	2.7
SP44	W 40-1	0-6 in	duplicate					x	1010		
SP44	W 40-1	6 - 12 in						x	3290		
SP44	W 40-2	0-6 in	952	1142	1659	**1659**	**1251**	x	860	37%	
SP44	W 40-2	0-6 in	duplicate					x	843		
SP44	W 40-2	6 - 12 in						x	1730		

High Limit 1500 | 87 = Number a
Average Limit 1000 | 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP13	N 40	0-6 in	1111	943	885	1111	980	x	822	18%	
SP13	N 40	0-6 in	duplicate						627		
SP13	W 40-2	0-6 in	1243	1061	1338	1338	**1214**	x	2060	52%	
SP13	W 40-2	0-6 in	duplicate						1440		
SP13	W 60-1	0-6 in	807	839	891	891	846	x	1120	28%	
SP13	W 60-1	0-6 in	duplicate						1190		
SP13	W 40-1	0-6 in	1063	1075	1139	1139	**1092**	x	1150	5%	
SP13	W 40-1	0-6 in	duplicate						1160		
SP14	S 40	0-6 in	791	689	675	791	718	x	640	12%	
SP14	W 40-2	0-6 in	677	654	828	828	720	x	857	17%	
SP14	W 40-1	0-6 in	1001	718	786	1001	835	x	764	9%	
SP7	W 20-1	0-6 in	230	236	272	272	246	x	164	40%	
SP7	S 20-1	0-6 in	133	149	143	149	142	x	103	32%	
SP7	S 20-2	0-6 in	166	151	200	200	172	x	207	18%	
SP9	20N	0-6 in	concrete	concrete	concrete	0	0				
SP9	20N	6 - 12 in	114	118	122	122	118	x	99.8	17%	
SP9	20N	12 - 18 in	88	168	98	168	118				
SP9	20N	18 - 24 in	97	34	50	97	60				
SP9	20N	2 - 3 ft	<20	<20	<20	0	0	x	11.6		
SP9	20N	3 - 4 ft	<20	<20	<20	0	0				
SP9	20N	4 - 5 ft	30	33	<20	33	32				
SP9	20S	0-6 in	concrete	concrete	concrete	0	0				
SP9	20S	6 - 12 in	<20	<20	<20	0	0				
SP9	20S	12 - 18 in	<20	<20	<20	0	0				
SP9	20S	18 - 24 in	1495	1662	1346	**1662**	**1501**	x	1150	26%	
SP9	20S	2 - 3 ft	23	323	236	323	194				
SP9	20S	3 - 4 ft	146	140	39	146	108				
SP9	20S	4 - 5 ft	234	105	236	236	192	x	395	69%	
SP9	20E	0-6 in	concrete	concrete	concrete	0	0				
SP9	20E	6 - 12 in	49	38	72	72	53	x	52.5	1%	
SP9	20E	12 - 18 in	68	60	49	68	59				
SP9	20E	18 - 24 in	1996	6012	1900	**6012**	**3303**				
SP9	20E	2 - 3 ft	385	228	363	385	325	x	405	22%	
SP9	20E	3 - 4 ft	373	334	1319	1319	675	x	759	12%	
SP9	20E	4 - 5 ft	<20	<20	<20	0	0				
SP9	20W	0-6 in	concrete	concrete	concrete	0	0				
SP9	20W	6 - 12 in	<20	<20	<20	0	0	x	8.6		
SP9	20W	12 - 18 in	23	1067	36	1067	375	x	1770	130%	
SP9	20W	18 - 24 in	22800	2143	8132	**22800**	**11025**	x	7430	39%	22.7
SP9	20W	2 - 3 ft	180	403	476	476	353				
SP9	20W	3 - 4 ft	8	444	313	444	255				
SP9	20W	4 - 5 ft	<20	<20	<20	0	0				
SP9	28SE	0-6 in	<20	<20	<20	0	0	x	13.2		
SP9	28SE	6 - 12 in	<20	<20	<20	0	0				
SP9	28SE	12 - 18 in	59	73	21	73	51	x	29.9	52%	
SP9	28SE	18 - 24 in	<20	<20	<20	0	0				
SP9	28SE	2 - 3 ft	<20	<20	<20	0	0				
SP9	28SE	3 - 4 ft	<20	<20	<20	0	0				
SP9	28SE	4 - 5 ft	41	71	<20	71	56				
SP9	40S	0-6 in	62	165	185	185	137	x	244	56%	
SP9	40S	6 - 12 in	323	343	890	890	519	x	625	19%	
SP9	40S	12 - 18 in	291	131	249	291	224				
SP9	40S	18 - 24 in	138	267	195	267	200				
SP9	40S	2 - 3 ft	196	228	181	228	202				
SP9	40S	3 - 4 ft	146	<20	<20	146	146				
SP9	40S	4 - 5 ft	<20	<20	<20	0	0				

EXIDE Soil
XRF results / Labratory Results / TCLP Results

High Limit 1500 | 87 = Number a
Average Limit 1000 | 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP9	40E	0-6 in	6341	8907	7381	**8907**	**7543**	x	4600	48%	
SP9	40E	6 - 12 in	32	362	340	362	245				
SP9	40E	12 - 18 in	644	478	511	644	544	x	592	8%	
SP9	40E	18 - 24 in	474	544	502	544	507				
SP9	40E	2 - 3 ft	<20	<20	<20	0	0				
SP9	40E	3 - 4 ft	<20	<20	<20	0	0				
SP9	40E	4 - 5 ft	<20	<20	<20	0	0				
SP9	28NE	0-6 in	concrete	concrete	concrete	0	0				
SP9	28NE	6 - 12 in	<20	20	18	20	19	x	14.3	28%	
SP9	28NE	12 - 18 in	<20	33	<20	33	33				
SP9	28NE	18 - 24 in	981	748	1065	1065	931	x	1020	9%	
SP9	28NE	2 - 3 ft	264	104	236	264	201				
SP9	28NE	3 - 4 ft	45	95	46	95	62				
SP9	28NE	4 - 5 ft	<20	<20	<20	0	0				
SP9	40W	0-6 in	concrete	concrete	concrete	0	0				
SP9	40W	6 - 12 in	<20	<20	<20	0	0				
SP9	40W	12 - 18 in	<20	30	22	30	26	x	27.9	7%	
SP9	40W	18 - 24 in	1814	755	647	**1814**	**1072**	x	652	49%	
SP9	40W	2 - 3 ft	2232	967	1646	**2232**	**1615**	x	1140	34%	1.5
SP9	40W	3 - 4 ft	173	326	167	326	222	x	127	54%	
SP9	40W	4 - 5 ft	70	20	80	80	57				
SP9	28NW	0-6 in	concrete	concrete	concrete	0	0				
SP9	28NW	6 - 12 in	93	36	65	93	65				
SP9	28NW	12 - 18 in	643	456	564	643	554	x	874	45%	
SP9	28NW	18 - 24 in	344	261	544	544	383				
SP9	28NW	2 - 3 ft	<20	284	309	309	297				
SP9	28NW	3 - 4 ft	58	53	60	60	57				
SP9	28NW	4 - 5 ft	71	37	48	71	52	x	99.5	63%	
SP9	28SW	0-6 in	concrete	concrete	concrete	0	0				
SP9	28SW	6 - 12 in	231	145	232	232	203	x	1320	147%	
SP9	28SW	12 - 18 in	56	32	43	56	44				
SP9	28SW	18 - 24 in	<20	<20	<20	0	0	x	6.1		
SP9	28SW	2 - 3 ft	132	268	144	268	181				
SP9	28SW	3 - 4 ft	43	26	75	75	48				
SP9	28SW	4 - 5 ft	30	<20	26	30	28				
SP9	40E 30E	0-6 in	1474	87	1825	**1825**	**1129**	x	1230	9%	
SP9	40E 30E	6 - 12 in	127	376	1638	**1638**	714	x	4420	144%	
SP9	40E 30E	12 - 18 in	106	172	205	205	161				
SP9	40E 30E	18 - 24 in	462	61	255	462	259				
SP9	40E 30E	2 - 3 ft	54	87	134	134	92				
SP9	40E 30E	3 - 4 ft	146	30	76	146	84				
SP9	40E 30E	4 - 5 ft	276	127	140	276	181	x	113	46%	
SP9	40E 30S	0-6 in	1973	3955	3520	**3955**	**3149**	x	3090	2%	
SP9	40E 30S	6 - 12 in	246	470	433	470	383				
SP9	40E 30S	12 - 18 in	588	325	649	649	521	x	656	23%	
SP9	40E 30S	18 - 24 in	156	125	78	156	120				
SP9	40E 30S	2 - 3 ft	<20	<20	23	23	23				
SP9	40E 30S	3 - 4 ft	26	<20	<20	26	26	x	39.7	42%	
SP9	40E 30S	4 - 5 ft	<20	<20	<20	0	0				
SP9	40E 30N	0-6 in	3373	4699	3589	**4699**	**3887**	x	3590	8%	
SP9	40E 30N	6 - 12 in	1482	541	1334	1482	**1119**	x	610	59%	
SP9	40E 30N	12 - 18 in	308	302	518	518	376				
SP9	40E 30N	18 - 24 in	79	118	636	636	278				
SP9	40E 30N	2 - 3 ft	<20	<20	<20	0	0				
SP9	40E 30N	3 - 4 ft	<20	<20	<20	0	0				
SP9	40E 30N	4 - 5 ft	<20	<20	<20	0	0				

								High Limit	1500		87 = Number a
								Average Limit	1000		83 = Number a
			XRF Results			XRF Results					
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP9	40W 30S	0-6 in	concrete	concrete	concrete	0	0				
SP9	40W 30S	6 - 12 in	<20	<20	<20	0	0				
SP9	40W 30S	12 - 18 in	<20	<20	<20	0	0				
SP9	40W 30S	18 - 24 in	<20	<20	<20	0	0				
SP9	40W 30S	2 - 3 ft	509	51	290	509	283	x	260	9%	
SP9	40W 30S	3 - 4 ft	16300	1314	2810	**16300**	**6808**	x	3140	74%	
SP9	40W 30S	4 - 5 ft	139	302	197	302	213				
SP9	40W 30N	0-6 in	concrete	concrete	concrete	0	0				
SP9	40W 30N	6 - 12 in	<20	<20	<20	0	0				
SP9	40W 30N	12 - 18 in	23	125	82	125	77	x	88.8	15%	
SP9	40W 30N	18 - 24 in	12300	4783	4921	**12300**	**7335**	x	4930	39%	
SP9	40W 30N	2 - 3 ft	7328	2751	2729	**7328**	**4269**	x	1380	102%	11
SP9	40W 30N	2 - 3 ft	re-analysis						2330		
SP9	40W 30N	3 - 4 ft	26	98	32	98	52				
SP9	40W 30N	4 - 5 ft	50	74	59	74	61				
SP9	40W 30W	0-6 in	concrete	concrete	concrete	0	0				
SP9	40W 30W	6 - 12 in	19	<20	<20	19	19				
SP9	40W 30W	12 - 18 in	<20	40	18	40	29				
SP9	40W 30W	18 - 24 in	97	206	180	206	161	x	2980	179%	
SP9	40W 30W	2 - 3 ft	597	996	773	996	789	x	639	21%	
SP9	40W 30W	3 - 4 ft	40	47	43	47	43				
SP9	40W 30W	4 - 5 ft	93	35	20	93	49				
SP9	75 SSE	0-6 in	1505	1586	1592	**1592**	**1561**	x	2090	29%	
SP9	75 SSE	6 - 12 in	271	262	445	445	326	x	2850	159%	
SP9	75 SSE	12 - 18 in	2330	3355	2644	**3355**	**2776**	x	946	98%	
SP9	75 SSE	18 - 24 in	453	1036	471	1036	653	x	473	32%	
SP9	75 SSE	2 - 3 ft	31	124	164	164	106				
SP9	75 SSE	3 - 4 ft	<20	<20	<20	0	0				
SP9	75 SSE	4 - 5 ft	<20	<20	<20	0	0				
SP9	75 SE	0-6 in	lost	lost	lost	0	0				
SP9	75 SE	6 - 12 in	<20	17	<20	17	17				
SP9	75 SE	12 - 18 in	298	430	365	430	364	x	457	23%	
SP9	75 SE	18 - 24 in	63	230	147	230	147	x	172	16%	
SP9	75 SE	2 - 3 ft	<20	<20	45	45	45	x	49.5	10%	
SP9	75 SE	3 - 4 ft	19	80	<20	80	50				
SP9	75 SE	4 - 5 ft	31	24	76	76	44				
SP9	60 SW	0-6 in	152	222	180	222	185	x	174	6%	
SP9	60 SW	6 - 12 in	262	264	215	264	247				
SP9	60 SW	12 - 18 in	143	299	77	299	173	x	84.2	69%	
SP9	60 SW	18 - 24 in	50	143	54	143	82				
SP9	60 SW	2 - 3 ft	66	41	156	156	88				
SP9	60 SW	3 - 4 ft	<20	<20	<20	0	0				
SP9	60 SW	4 - 5 ft	<20	<20	<20	0	0				
SP9	75 NW	0-6 in	concrete	concrete	concrete	0	0				
SP9	75 NW	6 - 12 in	6808	7774	10500	**10500**	**8361**	x	31900	117%	
SP9	75 NW	12 - 18 in	38700	82500	49700	**82500**	**56967**	x	40500	34%	23
SP9	75 NW	18 - 24 in	6992	6508	8254	**8254**	**7251**	x	15500	73%	12
SP9	75 NW	2 - 3 ft	1040	682	1255	1255	992	x	1020	3%	0.67
SP9	75 NW	3 - 4 ft	493	919	908	919	773	x	1430	60%	
SP9	75 NW	4 - 5 ft	<20	17	<20	17	17	x	17.7	4%	
SP9	125 NW	0-6 in	concrete	concrete	concrete	0	0				
SP9	125 NW	6 - 12 in	1115	1272	915	1272	**1101**	x	1230	11%	
SP9	125 NW	12 - 18 in	197	356	169	356	241				
SP9	125 NW	18 - 24 in	1314	126	169	1314	536	x	146	114%	
SP9	125 NW	2 - 3 ft	108	102	125	125	112				
SP9	125 NW	3 - 4 ft	86	46	85	86	72				
SP9	125 NW	4 - 5 ft	167	113	209	209	163	x	156	4%	

										High Limit	1500	87 = Number a	
			XRF Results			XRF Results				Average Limit	1000	83 = Number a	
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?		Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)	
SP9	100 S	0-6 in	673	988	834	988	832	x		804	3%	0.34	
SP9	100 S	6 - 12 in	527	430	612	612	523	x		687	27%		
SP9	100 S	12 - 18 in	2212	309	899	**2212**	**1140**	x		1530	29%	0.36	
SP9	100 S	18 - 24 in	23	44	18	44	28						
SP9	100 S	2 - 3 ft	<20	<20	<20	0	0						
SP9	100 S	3 - 4 ft	<20	<20	<20	0	0						
SP9	100 S	4 - 5 ft	<20	<20	<20	0	0						
SP9	125 WNW	0-6 in	concrete	concrete	concrete	0	0						
SP9	125 WNW	6 - 12 in	<20	<20	<20	0	0						
SP9	125 WNW	12 - 18 in	19	27	33	33	26	x		28.3	7%		
SP9	125 WNW	18 - 24 in	73	75	124	124	91	x		98.1	8%		
SP9	125 WNW	2 - 3 ft	<20	<20	<20	0	0						
SP9	125 WNW	3 - 4 ft	<20	<20	<20	0	0						
SP9	125 WNW	4 - 5 ft	<20	<20	<20	0	0						
SP9	100 SSE	0-6 in	826	553	777	826	719	x		648	10%		
SP9	100 SSE	6 - 12 in	47	418	342	418	269						
SP9	100 SSE	12 - 18 in	312	297	318	318	309						
SP9	100 SSE	18 - 24 in	217	473	263	473	318	x		798	86%		
SP9	100 SSE	2 - 3 ft	<20	<20	<20	0	0						
SP9	100 SSE	3 - 4 ft	<20	<20	<20	0	0						
SP9	100 SSE	4 - 5 ft	<20	<20	<20	0	0						
SP9	100 WSW	0-6 in	concrete	concrete	concrete	0	0						
SP9	100 WSW	6 - 12 in	203	99	64	203	122	x		101	19%		
SP9	100 WSW	12 - 18 in	300	230	322	322	284	x		551	64%		
SP9	100 WSW	18 - 24 in	135	230	167	230	177	x		453	87%		
SP9	100 WSW	2 - 3 ft	Ref @ 2	Ref @ 2	Ref @ 2	0	0						
SP9	100 WSW	3 - 4 ft	Ref @ 2	Ref @ 2	Ref @ 2	0	0						
SP9	100 WSW	4 - 5 ft	Ref @ 2	Ref @ 2	Ref @ 2	0	0						
SP9	100 WNW	0-6 in	concrete	concrete	concrete	0	0						
SP9	100 WNW	6 - 12 in	254	161	131	254	182	x		174	4%		
SP9	100 WNW	12 - 18 in	273	534	1202	1202	670	x		668	0%		
SP9	100 WNW	18 - 24 in	457	2936	6778	**6778**	**3390**						
SP9	100 WNW	2 - 3 ft	Ref @ 2	Ref @ 2	Ref @ 2	0	0						
SP9	100 WNW	3 - 4 ft	Ref @ 2	Ref @ 2	Ref @ 2	0	0						
SP9	100 WNW	4 - 5 ft	Ref @ 2	Ref @ 2	Ref @ 2	0	0						

EXIDE Soil

XRF results / Labratory Results / TCLP Results

High Limit 1500 87 = Number a

Average Limit 1000 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SS	101	0-6 in	6446	5979	3292	**6446**	**5239**	x	4260	21%	43.9
SS	102	0-6 in	2336	2115	2172	**2336**	**2208**				
SS	103	0-6 in	871	1032	919	1032	941				
SS	104	0-6 in	978	541	887	978	802				
SS	105	0-6 in	535	709	482	709	575				
SS	106	0-6 in	3826	1996	944	**3826**	**2255**				
SS	107	0-6 in	817	961	634	961	804				
SS	108	0-6 in	3294	1863	2438	**3294**	**2532**	x	1800	34%	21.1
SS	109	0-6 in	1912	293	2052	**2052**	**1419**				
SS	110	0-6 in	1071	1019	684	1071	925				
SS	111	0-6 in	4898	6097	6662	**6662**	**5886**	x	5460	8%	28.2
SS	112	0-6 in	3402	2829	3670	**3670**	**3300**	x	3560	8%	20.8
SS	113	0-6 in	5544	5373	9152	**9152**	**6690**	x	5700	16%	65.6
SS	114	0-6 in	13700	22600	17900	**22600**	**18067**	x	18700	3%	221
SS	115	0-6 in	2046	1486	3072	**3072**	**2201**				
SS	116	0-6 in	8508	2680	4207	**8508**	**5132**	x	5900	14%	60
SS	117	0-6 in	2444	2627	1845	**2627**	**2305**	x	2300	0%	14.6
SS	118	0-6 in	4260	3736	4426	**4426**	**4141**	x	3900	6%	27.7
SS	119	0-6 in	497	345	1407	1407	750				
SS	120	0-6 in	2061	1894	2699	**2699**	**2218**				
SS	121	0-6 in	3179	1451	3012	**3179**	**2547**	x	3040	18%	19.2
SS	122	0-6 in	10600	7487	15500	**15500**	**11196**	x	15900	35%	88
SS	123	0-6 in	3329	2681	2867	**3329**	**2959**	x	3510	17%	29.8
SS	124	0-6 in	542	3509	3394	**3509**	**2482**	x	3040	20%	17.2
SS	125	0-6 in	2715	3657	2156	**3657**	**2843**	x	2880	1%	18
SS	126	0-6 in	2973	4243	4196	**4243**	**3804**	x	4600	19%	23
SS	127	0-6 in	667	940	1522	**1522**	**1043**				
SS	128	0-6 in	2363	1609	2433	**2433**	**2135**				
SS	129	0-6 in	1815	1305	1693	**1815**	**1604**				

High Limit 1500 87 = Number a
Average Limit 1000 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP3R		0-6 in	376	550	578	578	501	x	699	33%	
SP3R		6 - 12 in	217	407	427	427	350	x	407	15%	
SP3R		12 - 18 in	218	304	771	771	431	x	234	59%	
SP3R		18 - 24 in	187	106	152	187	148				
SP3R		2 - 3 ft	109	288	129	288	175				
SP3R		3 - 4 ft	107	117	386	386	203				
SP3R		4 - 5 ft	65	196	114	196	125				
SP3R	5 W	0-6 in	444	279	546	546	423				
SP3R	5 W	6 - 12 in	238	144	373	373	252	x	193	26%	
SP3R	5 W	12 - 18 in	76	301	121	301	166				
SP3R	5 W	18 - 24 in	239	159	217	239	205	x	267	26%	
SP3R	5 W	2 - 3 ft	644	97	802	802	514				
SP3R	5 W	3 - 4 ft	153	62	240	240	152				
SP3R	5 W	4 - 5 ft	56	230	15	230	100				
SP3R	5 E	0-6 in	782	771	919	919	824	x	898	9%	
SP3R	5 E	6 - 12 in	508	1502	376	**1502**	795	x	536	39%	
SP3R	5 E	12 - 18 in	260	194	138	260	197				
SP3R	5 E	18 - 24 in	908	678	1003	1003	863	x	1020	17%	
SP3R	5 E	2 - 3 ft	297	1046	135	1046	493				
SP3R	5 E	3 - 4 ft	265	280	258	280	268				
SP3R	5 E	4 - 5 ft	220	208	260	260	229				
SP5R		0-6 in	1825	1685	1820	**1825**	**1777**	x	3000	51%	9.2
SP5R		6 - 12 in	9980	7810	4841	**9980**	**7544**				
SP5R		12 - 18 in	467	3331	695	**3331**	**1498**	x	1430	5%	
SP5R		18 - 24 in	18	28	26	28	24	x	105	126%	
SP5R		2 - 3 ft	115	47	63	115	75				
SP5R		3 - 4 ft	30	7	7	30	15				
SP5R		4 - 5 ft	7	10	6	10	8				
SP6R		0-6 in	12300	626	2871	**12300**	**5266**				
SP6R		6 - 12 in	15888	2790	1367	**15888**	**6682**				
SP6R		12 - 18 in	181	69	150	181	133	x	240	57%	
SP6R		18 - 24 in	91	153	125	153	123	x	170	32%	
SP6R		2 - 3 ft	57	20	44	57	40				
SP6R		3 - 4 ft	74	27	49	74	50				
SP6R		4 - 5 ft	32	19	12	32	21				
SP7R		0-6 in	1854	1258	997	**1854**	**1370**				
SP7R		6 - 12 in	135	390	346	390	290	x	523	57%	
SP7R		12 - 18 in	493	192	266	493	317	x	486	42%	
SP7R		18 - 24 in	69	42	14	69	42				
SP7R		2 - 3 ft	11	21	15	21	16				
SP7R		3 - 4 ft	13	11	18	18	14				
SP7R		4 - 5 ft	11	13	7	13	10				
SP8R		0-6 in	1227	1347	1517	**1517**	**1364**	x	1220	11%	2.1
SP8R		6 - 12 in	124	536	1185	1185	615	x	377	48%	
SP8R		12 - 18 in	118	152	200	200	157	x	162	3%	
SP8R		18 - 24 in	251	357	147	357	252				
SP8R		2 - 3 ft	166	62	180	180	136				
SP8R		3 - 4 ft	91	95	248	248	145				
SP8R		4 - 5 ft	38	26	12	38	25				
SP12R		0-6 in	47	40	44	47	44				
SP12R		6 - 12 in	919	1827	1169	**1827**	**1305**	x	1300	0%	
SP12R		12 - 18 in	1398	464	1095	1398	986	x	4260	125%	
SP12R		18 - 24 in	13	19	14	19	15				
SP12R		2 - 3 ft	16	15	11	16	14				
SP12R		3 - 4 ft	15	12	14	15	14				
SP12R		4 - 5 ft	16	6	7	16	10				

								High Limit	1500	87 = Number a	
			XRF Results			XRF Results		Average Limit	1000	83 = Number a	
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP46		0 - 1 ft	288	97	243	288	209				
SP46		1 - 2 ft	693	380	164	693	412	x	367	12%	
SP46		2 - 3 ft	406	363	338	406	369	x	755	69%	
SP46		3 - 4 ft	72	56	288	288	139				
SP46		4 - 5 ft				0	0				
SP47		0-6 in	845	1680	3978	**3978**	**2168**				
SP47		6 - 12 in	235	318	489	489	347	x	957	93%	
SP47		12 - 18 in	198	92	158	198	149	x	113	28%	
SP47		18 - 24 in	78	62	111	111	84				
SP47		2 - 3 ft	34	24	40	40	33				
SP47		3 - 4 ft	27	27	47	47	34				
SP47		4 - 5 ft	78	84	69	84	77				
SP48		0-6 in	2250	2530	1477	**2530**	**2086**				
SP48		6 - 12 in	612	194	521	612	442	x	791	57%	
SP48		12 - 18 in	7	22	111	111	47	x	15.7	99%	
SP48		18 - 24 in	10	5	8	10	8				
SP48		2 - 3 ft	22	46	14	46	27				
SP48		3 - 4 ft	10	10	8	10	9				
SP48		4 - 5 ft	8	7	12	12	9				
SP49		0-6 in	36	33	43	43	37	x	100	91%	
SP49		6 - 12 in	13	32	27	32	24				
SP49		12 - 18 in	468	1194	324	1194	662	x	1310	66%	
SP49		18 - 24 in	258	129	99	258	162				
SP49		2 - 3 ft	283	210	272	283	255				
SP49		3 - 4 ft	8	10	15	15	11				
SP49		4 - 5 ft	12	9	9	12	10				
SP50		0-6 in	164	130	155	164	150	x	164	9%	
SP50		6 - 12 in	160	114	157	160	144				
SP50		12 - 18 in	886	774	62	886	574	x	93.2	144%	
SP50		18 - 24 in	289	78	191	289	186				
SP50		2 - 3 ft	141	168	169	169	159				
SP50		3 - 4 ft	13	10	21	21	15				
SP50		4 - 5 ft	7	11	8	11	9				
SP51		0-6 in	100	225	72	225	132	x	156	16%	
SP51		6 - 12 in	81	104	139	139	108				
SP51		12 - 18 in	198	167	206	206	190	x	173	10%	
SP51		18 - 24 in	208	85	53	208	115				
SP51		2 - 3 ft	7	9	13	13	10				
SP51		3 - 4 ft	8	7	10	10	8				
SP51		4 - 5 ft	11	11	10	11	11				
SP52		0-6 in	conc	conc	conc	0	0				
SP52		6 - 12 in	8	13	10	13	10				
SP52		12 - 18 in	16	9	14	16	13	x	17.5	30%	
SP52		18 - 24 in	26	17	19	26	21				
SP52		2 - 3 ft	refusal	refusal	refusal	0	0				
SP52		3 - 4 ft	refusal	refusal	refusal	0	0				
SP52		4 - 5 ft	refusal	refusal	refusal	0	0				
SP53		0-6 in	9960	4380	9960	**9960**	**8100**				
SP53		6 - 12 in	384	408	554	554	449	x	844	61%	
SP53		12 - 18 in	150	130	136	150	139				
SP53		18 - 24 in	288	517	285	517	363	x	307	17%	
SP53		2 - 3 ft	54	20	37	54	37				
SP53		3 - 4 ft	385	402	357	402	381				
SP53		4 - 5 ft	70	91	92	92	84				

High Limit 1500   87 = Number a
Average Limit 1000   83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP54		0-6 in	3094	2279	3107	**3107**	**2827**				
SP54		6 - 12 in	737	715	627	737	693	x	965	33%	
SP54		12 - 18 in	250	236	230	250	239	x	159	40%	
SP54		18 - 24 in	51	227	36	227	105				
SP54		2 - 3 ft	9	13	8	13	10				
SP54		3 - 4 ft	8	16	9	16	11				
SP54		4 - 5 ft	10	11	16	16	12				
SP55		0-6 in	1315	1168	1329	1329	**1271**	x	1800	34%	
SP55		6 - 12 in	697	587	889	889	724	x	730	1%	
SP55		12 - 18 in	500	608	464	608	524	x	640	20%	
SP55		18 - 24 in	208	93	383	383	228	x	489	73%	
SP55		2 - 3 ft	34	91	63	91	63				
SP55		3 - 4 ft	13	28	20	28	20				
SP55		4 - 5 ft	10	10	9	10	10				
SP56		0-6 in	13	9	20	20	14				
SP56		6 - 12 in	132	93	88	132	104	x	160	42%	
SP56		12 - 18 in	420	240	447	447	369	x	435	16%	
SP56		18 - 24 in	1207	593	829	1207	876	x	956	9%	
SP56		2 - 3 ft	98	90	63	98	84				
SP56		3 - 4 ft	22	25	16	25	21				
SP56		4 - 5 ft	7	9	11	11	9				
SP57		0-6 in	1308	1942	1925	**1942**	**1725**	x	1880	9%	14.0
SP57		6 - 12 in	147	50	97	147	98	x	217	76%	
SP57		12 - 18 in	38	39	28	39	35				
SP57		18 - 24 in	22	25	16	25	21				
SP57		2 - 3 ft	11	16	14	16	14				
SP57		3 - 4 ft	12	16	15	16	14				
SP57		4 - 5 ft	11	9	10	11	10				
SP58		0-6 in	247	517	393	517	386	x	528	31%	
SP58		6 - 12 in	408	224	296	408	309				
SP58		12 - 18 in	137	168	147	168	151	x	194	25%	
SP58		18 - 24 in	37	42	43	43	41				
SP58		2 - 3 ft	19	11	16	19	15				
SP58		3 - 4 ft	11	16	12	16	13				
SP58		4 - 5 ft	6	5	10	10	7				
SP59		0-6 in	60	222	204	222	162	x	144	12%	
SP59		6 - 12 in	84	120	111	120	105				
SP59		12 - 18 in	75	135	166	166	125				
SP59		18 - 24 in	120	104	45	120	90				
SP59		2 - 3 ft	11	15	12	15	13				
SP59		3 - 4 ft	9	12	11	12	11				
SP59		4 - 5 ft	10	34	10	34	18				
SP60		0-6 in	554	695	821	821	690	x	918	28%	
SP60		6 - 12 in	558	970	730	970	753	x	1190	45%	
SP60		12 - 18 in	100	224	206	224	177				
SP60		18 - 24 in	17	16	43	43	25				
SP60		2 - 3 ft	26	11	11	26	16				
SP60		3 - 4 ft	7	12	8	12	9				
SP60		4 - 5 ft	22	10	16	22	16				
SP61		0-6 in	12	9	10	12	10				
SP61		6 - 12 in	12	7	11	12	10				
SP61		12 - 18 in	54	97	8	97	53				
SP61		18 - 24 in	1587	2110	425	**2110**	**1374**	x	1040	28%	
SP61		2 - 3 ft	288	542	456	542	429	x	386	10%	
SP61		3 - 4 ft	261	312	141	312	238				
SP61		4 - 5 ft	176	143	187	187	169	x	131	25%	

High Limit 1500 | 87 = Number a
Average Limit 1000 | 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP62		0-6 in	13	10	12	13	12				
SP62		6 - 12 in	22	17	15	22	18				
SP62		12 - 18 in	51	51	47	51	50				
SP62		18 - 24 in	84	41	63	84	63				
SP62		2 - 3 ft	345	66	345	345	252	x	404	46%	
SP62		3 - 4 ft	164	132	32	164	109	x	35.6	102%	
SP62		4 - 5 ft	12	9	11	12	11				
SP63		0-6 in	17	11	7	17	12				
SP63		6 - 12 in	17	23	40	40	27				
SP63		12 - 18 in	8	14	7	14	10				
SP63		18 - 24 in	617	10	9	617	212	x	12.1	178%	
SP63		2 - 3 ft	10	11	15	15	12				
SP63		3 - 4 ft	8	10	20	20	13				
SP63		4 - 5 ft	11700	3600	3030	**11700**	**6110**	x	6890	12%	
SP63 R		0-6 in	conc	conc	conc	0	0				
SP63 R		1 - 2 ft	14	9	14	14	12	x	18.5	40%	
SP63 R		2 - 3 ft	8	12	10	12	10				
SP63 R		3 - 4 ft	20	8	9	20	12				
SP63 R		4 - 5 ft	203	461	147	461	270	x	171	45%	
SP63 R		5 - 6 ft	41	34	21	41	32				
SP63 R		6 - 7 ft	12	27	12	27	17				
SP63 R		7 - 8 ft	16	5	11	16	11				
SP63 R		8 - 9 ft	8	9	6	9	8				
SP63 R		9 - 10 ft	8	13	8	13	10				
SP64		0-6 in	11	6	10	11	9				
SP64		6 - 12 in	13	12	16	16	14				
SP64		12 - 18 in	8	6	7	8	7				
SP64		18 - 24 in	11	9	5	11	8				
SP64		2 - 3 ft	13	32	8	32	18				
SP64		3 - 4 ft	360	6	9	360	125	x	8.1	176%	
SP64		4 - 5 ft	16	21	31	31	23				
SP65		0-6 in	529	398	364	529	430	x	319	30%	
SP65		6 - 12 in	144	98	111	144	118				
SP65		12 - 18 in	469	1597	917	**1597**	994	x	714	33%	
SP65		18 - 24 in	243	139	359	359	247	x	146	51%	
SP65		2 - 3 ft	14	12	8	14	11				
SP65		3 - 4 ft	10	8	15	15	11				
SP65		4 - 5 ft	12	12	9	12	11				
SP66		0-6 in	1064	423	2799	**2799**	**1429**	x	851	51%	
SP66		6 - 12 in	163	218	115	218	165	x	119	33%	
SP66		12 - 18 in	124	77	61	124	87	x	59.3	38%	
SP66		18 - 24 in	34	57	129	129	73				
SP66		2 - 3 ft	162	140	46	162	116				
SP66		3 - 4 ft	12	61	16	61	30				
SP66		4 - 5 ft	9	13	11	13	11				
SP67		0-6 in	1667	2351	2378	**2378**	**2132**				
SP67		6 - 12 in	4850	1446	7880	**7880**	**4725**				
SP67		12 - 18 in	217	214	381	381	271	x	783	97%	
SP67		18 - 24 in	82	71	114	114	89	x	151	52%	
SP67		2 - 3 ft	8	24	11	24	14				
SP67		3 - 4 ft	6	7	9	9	7				
SP67		4 - 5 ft	8	7	6	8	7				

High Limit 1500 — 87 = Number a
Average Limit 1000 — 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP68		0-6 in	78	117	158	158	118	x	172	38%	
SP68		6 - 12 in	109	228	18	228	118	x	57.7	69%	
SP68		12 - 18 in	25	53	22	53	33				
SP68		18 - 24 in	31	24	38	38	31				
SP68		2 - 3 ft	8	8	5	8	7				
SP68		3 - 4 ft	6	9	6	9	7				
SP68		4 - 5 ft	7	8	9	9	8				
SP69		0-6 in	4384	2066	7780	**7780**	**4743**	x	11800	85%	
SP69		6 - 12 in	3150	7480	8870	**8870**	**6500**				
SP69		12 - 18 in	252	586	552	586	463	x	1210	89%	
SP69		18 - 24 in	58	39	76	76	58				
SP69		2 - 3 ft	74	34	70	74	59				
SP69		3 - 4 ft	371	256	44	371	224				
SP69		4 - 5 ft	14	19	69	69	34				
SP70		0-6 in	1186	1218	1581	**1581**	**1328**	x	874	41%	
SP70		6 - 12 in	2427	2450	2282	**2450**	**2386**	x	1540	43%	2.4
SP70		12 - 18 in	214	226	435	435	292	x	308	5%	
SP70		18 - 24 in	194	128	215	215	179	x	103	54%	
SP70		2 - 3 ft	18	20	15	20	18				
SP70		3 - 4 ft	8	8	12	12	9				
SP70		4 - 5 ft	16	15	6	16	12				
SP71		0-6 in	4100	4380	3007	**4380**	**3829**	x	3260	16%	
SP71		6 - 12 in	586	50	1572	**1572**	736	x	760	3%	
SP71		12 - 18 in	247	115	316	316	226				
SP71		18 - 24 in	94	102	141	141	112	x	109	3%	
SP71		2 - 3 ft	69	116	91	116	92				
SP71		3 - 4 ft	34	253	15	253	101				
SP71		4 - 5 ft	58	90	64	90	71				
SP72		0-6 in	636	468	547	636	550	x	504	9%	
SP72		6 - 12 in	147	217	108	217	157	x	304	64%	
SP72		12 - 18 in	26	18	34	34	26				
SP72		18 - 24 in	9	10	12	12	10				
SP72		2 - 3 ft	19	13	9	19	14				
SP72		3 - 4 ft	8	12	9	12	10				
SP72		4 - 5 ft	7	9	7	9	8				
SP73		0-6 in	438	470	580	580	496	x	437	13%	
SP73		6 - 12 in	398	311	403	403	371	x	344	7%	
SP73		12 - 18 in	263	319	360	360	314				
SP73		18 - 24 in	156	97	273	273	175				
SP73		2 - 3 ft	8	10	10	10	9				
SP73		3 - 4 ft	6	13	13	13	11				
SP73		4 - 5 ft	6	6	11	11	8				
SP74		0-6 in	114	123	73	123	103	x	99.1	4%	
SP74		6 - 12 in	154	166	186	186	169				
SP74		12 - 18 in	172	179	263	263	205	x	205	0%	
SP74		18 - 24 in	18	18	41	41	26				
SP74		2 - 3 ft	12	13	9	13	11				
SP74		3 - 4 ft	10	9	12	12	10				
SP74		4 - 5 ft	8	6	6	8	7				

High Limit 1500 — 87 = Number a
Average Limit 1000 — 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP75		0-6 in	152	108	45	152	102				
SP75		6 - 12 in	155	225	145	225	175	x	160	9%	
SP75		12 - 18 in	281	95	127	281	168				
SP75		18 - 24 in	213	98	181	213	164				
SP75		2 - 3 ft	10	11	20	20	14				
SP75		3 - 4 ft	8	22	12	22	14				
SP75		4 - 5 ft	22	9	7	22	13				
SP76		0-6 in	750	460	620	750	610	x	651	7%	
SP76		6 - 12 in	148	152	631	631	310	x	249	22%	
SP76		12 - 18 in	381	315	173	381	290				
SP76		18 - 24 in	41	472	123	472	212				
SP76		2 - 3 ft	10	10	8	10	9				
SP76		3 - 4 ft	10	10	12	12	11				
SP76		4 - 5 ft	16	13	5	16	11				
SP77		0-6 in	conc	conc	conc	0	0				
SP77		12 - 24 in	7	12	17	17	12				
SP77		2 - 3 ft	110	17	20	110	49				
SP77		3 - 4 ft	24300	946	41500	**41500**	**22249**	x	38400	53%	
SP77		4 - 5 ft	16100	281	569	**16100**	**5650**	x	16300	97%	
SP77		5 - 7 ft	14	195	64	195	91	x	55	49%	
SP77		7 - 10 ft	18	9	18	18	15				
SP78		0-6 in	6	12	9	12	9				
SP78		6 - 12 in	13	10	10	13	11				
SP78		12 - 18 in	12	6	11	12	10				
SP78		18 - 24 in	18	17	18	18	18				
SP78		2 - 3 ft	841	58	89	841	329	x	559	52%	
SP78		3 - 4 ft	1881	1610	1685	**1881**	**1725**	x	1630	6%	1.4
SP78		4 - 5 ft	193	22	63	193	93				
SP78		5 - 6 ft	76	71	55	76	67				
SP78		6 - 7 ft	33	11	11	33	18				
SP78		7 - 8 ft	9	6	9	9	8				
SP78		8 - 9 ft	5	6	8	8	6				
SP78		9 - 10 ft	12	12	10	12	11				
SP79		0-6 in	conc	conc	conc	0	0				
SP79		6 - 12 in	117	93	123	123	111				
SP79		12 - 18 in	526	514	297	526	446	x	380	16%	
SP79		18 - 24 in	271	365	286	365	307				
SP79		2 - 3 ft	350	253	279	350	294				
SP79		3 - 4 ft	168	63	327	327	186	x	174	7%	
SP79		4 - 5 ft	10	9	8	10	9				
SP79		5 - 6 ft	23	11	10	23	15				
SP79		6 - 7 ft	7	15	11	15	11				
SP79		7 - 8 ft	10	16	7	16	11				
SP79		8 - 9 ft	9	12	9	12	10				
SP79		9 - 10 ft	8	14	18	18	13				
SP80		0-6 in	22	1016	48	1016	362	x	150	83%	
SP80		6 - 12 in	10	629	13	629	217	x			
SP80		12 - 18 in	1114	1945	1890	**1945**	**1650**	x	1300	24%	
SP80		18 - 24 in	10	29	28	29	22				
SP80		2 - 3 ft	12	9	9	12	10				
SP80		3 - 4 ft	12	11	7	12	10				
SP80		4 - 5 ft	26	19	32	32	26				
SP80		5 - 6 ft	62	93	51	93	69				
SP80		6 - 7 ft	31	68	41	68	47				
SP80		7 - 8 ft	41	72	31	72	48				
SP80		8 - 9 ft	51	56	50	56	52				
SP80		9 - 10 ft	1304	180	2276	**2276**	**1253**	x	1930	43%	

EXIDE Soil
XRF results / Labratory Results / TCLP Results

								High Limit	1500		87 = Number a
			XRF Results			XRF Results		Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP81		0-6 in	conc	conc	conc	0	0				
SP81		6 - 12 in	19	11	32	32	21				
SP81		12 - 18 in	78	38	83	83	66				
SP81		18 - 24 in	76	90	90	90	85				
SP81		2 - 3 ft	82	115	80	115	92				
SP81		3 - 4 ft	73	138	183	183	131	x	514	119%	
SP81		4 - 5 ft	168	86	54	168	103				
SP81		5 - 6 ft	30	62	13	62	35				
SP81		6 - 7 ft	57	8	18	57	28				
SP81		7 - 8 ft	25	18	15	25	19				
SP81		8 - 9 ft	168	18	9	168	65				
SP81		9 - 10 ft	8	9	10	10	9				
SP82		0-6 in	conc	conc	conc	0	0				
SP82		6 - 12 in	46	231	46	231	108	x	306	96%	
SP82		12 - 18 in	11	19	17	19	16				
SP82		18 - 24 in	18	8	29	29	18				
SP82		2 - 3 ft	27	52	27	52	35				
SP82		3 - 4 ft	23	26	18	26	22				
SP82		4 - 5 ft	469	101	682	682	417	x	423	1%	
SP82		5 - 6 ft	42	118	62	118	74				
SP83		0-6 in	9	10	12	12	10				
SP83		6 - 12 in	14	9	10	14	11				
SP83		12 - 18 in	17	11	8	17	12				
SP83		18 - 24 in	105	13	70	105	63				
SP83		2 - 3 ft	239	786	298	786	441	x	276	46%	
SP83		3 - 4 ft	159	92	80	159	110				
SP83		4 - 5 ft	416	283	330	416	343	x	259	28%	
SP83		5 - 6 ft	43	174	248	248	155				
SP83		6 - 7 ft	48	30	60	60	46				
SP83		7 - 8 ft	30	16	24	30	23				
SP83		8 - 9 ft	48	20	52	52	40				
SP83		9 - 10 ft	9	9	11	11	10				

EXIDE Soil
XRF results / Labratory Results / TCLP Results

								High Limit	1500		87 = Number a
			XRF Results			XRF Results		Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SS	1	0-6 in				0	0		7360		
SS	2	0-6 in	6643			**6643**	**6643**		6070	9%	
SS	3	0-6 in	6331			**6331**	**6331**		9000	35%	
SS	4	0-6 in	8383			**8383**	**8383**		8570	2%	
SS	5	0-6 in	6101			**6101**	**6101**		5620	8%	
SS	6	0-6 in	7216			**7216**	**7216**		6200	15%	
SS	7	0-6 in	5663			**5663**	**5663**		4510	23%	
SS	8	0-6 in	3003			**3003**	**3003**		10300	110%	
SS	9	0-6 in	6324			**6324**	**6324**		4840	27%	
SP-1		0-6 in	89			89	89		85.4		
SP-1		6 - 12 in	77			77	77		85.4		
SP-1		12 - 18 in	81			81	81				
SP-1		18 - 24 in	<22			0	0				
SP-1		2 - 2.5 ft	42			42	42				
SP-1		2.5 - 3 ft	21			21	21				
SP-1		3 - 3.5 ft	<34			0	0				
SP-1		3.5 - 4 ft	<15			0	0				
SP-1		4 - 4.5 ft	89			89	89				
SP-1		4.5 - 5 ft	<13			0	0				
SP-1		5 - 6 ft	<19			0	0				
SP-1		6 - 7 ft	76			76	76				
SP-1		7 - 8 ft	35			35	35				
SP-1		8 - 9 ft	32			32	32				
SP-1		9 - 10 ft	24			24	24				
SP-2		0-6 in	76			76	76		70.4		
SP-2		6 - 12 in	145			145	145		70.4		
SP-2		12 - 18 in	43			43	43				
SP-2		18 - 24 in	117			117	117				
SP-2		2 - 2.5 ft	173			173	173				
SP-2		2.5 - 3 ft	12			12	12				
SP-2		3 - 3.5 ft	55			55	55				
SP-2		3.5 - 4 ft	46			46	46				
SP-2		4 - 4.5 ft	53			53	53				
SP-2		4.5 - 5 ft	27			27	27				
SP-2		5 - 6 ft	<9			0	0				
SP-2		6 - 7 ft	<12			0	0				
SP-2		7 - 8 ft	<16			0	0				
SP-2		8 - 9 ft	<15			0	0				
SP-2		9 - 10 ft	11			11	11				
SP-3		0-6 in	1166			1166	**1166**		1160		
SP-3		6 - 12 in	835			835	835		1160		
SP-3		12 - 18 in	309			309	309				
SP-3		18 - 24 in	77			77	77				
SP-3		2 - 2.5 ft	145			145	145				
SP-3		2.5 - 3 ft	142			142	142				
SP-3		3 - 3.5 ft	53			53	53				
SP-3		3.5 - 4 ft	85			85	85				
SP-3		4 - 4.5 ft	127			127	127				
SP-3		4.5 - 5 ft	31			31	31				
SP-3		5 - 6 ft	248			248	248				
SP-3		6 - 7 ft	76			76	76				
SP-3		7 - 8 ft	17			17	17				
SP-3		8 - 9 ft	<11			0	0				
SP-3		9 - 10 ft	<9			0	0				

								High Limit	1500		87 = Number a
			XRF Results			XRF Results		Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-4		0-6 in	<29			0	0				
SP-4		6 - 12 in	68			68	68				
SP-4		12 - 18 in	109			109	109				
SP-4		18 - 24 in	60			60	60				
SP-4		2 - 2.5 ft	54			54	54				
SP-4		2.5 - 3 ft	153			153	153				
SP-4		3 - 3.5 ft	218			218	218		125		
SP-4		3.5 - 4 ft	21			21	21		125		
SP-4		4 - 4.5 ft	108			108	108				
SP-4		4.5 - 5 ft	126			126	126				
SP-4		5 - 6 ft	211			211	211				
SP-4		6 - 7 ft	<15			0	0				
SP-4		7 - 8 ft	<11			0	0				
SP-4		8 - 9 ft	16			16	16				
SP-4		9 - 10 ft	103			103	103				
SP-5		0-6 in	1486			1486	**1486**		873		
SP-5		6 - 12 in	374			374	374		873		
SP-5		12 - 18 in	89			89	89				
SP-5		18 - 24 in	19			19	19				
SP-5		2 - 2.5 ft	166			166	166				
SP-5		2.5 - 3 ft	69			69	69				
SP-5		3 - 3.5 ft	43			43	43				
SP-5		3.5 - 4 ft	<12			0	0				
SP-5		4 - 4.5 ft	<13			0	0				
SP-5		4.5 - 5 ft	<13			0	0				
SP-5		5 - 6 ft	81			81	81				
SP-5		6 - 7 ft	35			35	35				
SP-5		7 - 8 ft	17			17	17				
SP-5		8 - 9 ft	<16			0	0				
SP-5		9 - 10 ft	23			23	23				
SP-6		0-6 in	1087			1087	**1087**		6630		
SP-6		6 - 12 in	510			510	510		6630		
SP-6		12 - 18 in	325			325	325		6630		
SP-6		18 - 24 in	451			451	451		6630		
SP-6		2 - 2.5 ft	178			178	178				
SP-6		2.5 - 3 ft	63			63	63				
SP-6		3 - 3.5 ft	17			17	17				
SP-6		3.5 - 4 ft	72			72	72				
SP-6		4 - 4.5 ft	21			21	21				
SP-6		4.5 - 5 ft	318			318	318				
SP-6		5 - 6 ft	29			29	29				
SP-6		6 - 7 ft	<2			0	0				
SP-6		7 - 8 ft	<18			0	0				
SP-6		8 - 9 ft	<16			0	0				
SP-6		9 - 10 ft	<25			0	0				
SP-7		0-6 in	1528			**1528**	**1528**		1990		
SP-7		6 - 12 in	389			389	389		1990		
SP-7		12 - 18 in	65			65	65		1990		
SP-7		18 - 24 in	18			18	18		1990		
SP-7		2 - 2.5 ft	<9			0	0				
SP-7		2.5 - 3 ft	26			26	26				
SP-7		3 - 3.5 ft	16			16	16				
SP-7		3.5 - 4 ft	29			29	29				
SP-7		4 - 4.5 ft	<13			0	0				
SP-7		4.5 - 5 ft	<12			0	0				
SP-7		5 - 6 ft	58			58	58				
SP-7		6 - 7 ft	<11			0	0				
SP-7		7 - 8 ft	35			35	35				
SP-7		8 - 9 ft	<10			0	0				
SP-7		9 - 10 ft	12			12	12				

									High Limit	1500		87 = Number a
			XRF Results			XRF Results			Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?		Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-8		0-6 in	72			72	72			1470		
SP-8		6 - 12 in	196			196	196			1470		
SP-8		12 - 18 in	1044			1044	**1044**			1470		
SP-8		18 - 24 in	1337			1337	**1337**			1470		
SP-8		2 - 2.5 ft	361			361	361					
SP-8		2.5 - 3 ft	114			114	114					
SP-8		3 - 3.5 ft	<15			0	0					
SP-8		3.5 - 4 ft	<15			0	0					
SP-8		4 - 4.5 ft	<21			0	0					
SP-8		4.5 - 5 ft	<20			0	0					
SP-8		5 - 6 ft	79			79	79					
SP-8		6 - 7 ft	27			27	27					
SP-8		7 - 8 ft	42			42	42					
SP-8		8 - 9 ft	18			18	18					
SP-8		9 - 10 ft	<14			0	0					
SP-9		0-6 in	21			21	21					
SP-9		6 - 12 in	106			106	106					
SP-9		12 - 18 in	1281			1281	**1281**					
SP-9		18 - 24 in	259			259	259					
SP-9		2 - 2.5 ft	21400			**21400**	**21400**			1170		
SP-9		2.5 - 3 ft	11000			**11000**	**11000**			1170		
SP-9		3 - 3.5 ft	245			245	245			1170		
SP-9		3.5 - 4 ft	244			244	244			1170		
SP-9		4 - 4.5 ft	226			226	226					
SP-9		4.5 - 5 ft	155			155	155					
SP-9		5 - 6 ft	715			715	715					
SP-9		6 - 7 ft	<11			0	0					
SP-9		7 - 8 ft	<14			0	0					
SP-9		8 - 9 ft	<15			0	0					
SP-9		9 - 10 ft	<22			0	0					
SP-10		0-6 in	14			14	14					
SP-10		6 - 12 in	30			30	30					
SP-10		12 - 18 in	60			60	60					
SP-10		18 - 24 in	84			84	84					
SP-10		2 - 2.5 ft	463			463	463			57.3		
SP-10		2.5 - 3 ft	61			61	61			57.3		
SP-10		3 - 3.5 ft	105			105	105			57.3		
SP-10		3.5 - 4 ft	78			78	78			57.3		
SP-10		4 - 4.5 ft	14			14	14					
SP-10		4.5 - 5 ft	16			16	16					
SP-10		5 - 6 ft	46			46	46					
SP-10		6 - 7 ft	<13			0	0					
SP-10		7 - 8 ft	<16			0	0					
SP-10		8 - 9 ft	<20			0	0					
SP-10		9 - 10 ft	19			19	19					
SP-11		0-6 in	100			100	100			95.6		
SP-11		6 - 12 in	92			92	92			95.6		
SP-11		12 - 18 in	68			68	68			95.6		
SP-11		18 - 24 in	51			51	51			95.6		
SP-11		2 - 2.5 ft	<11			0	0					
SP-11		2.5 - 3 ft	14			14	14					
SP-11		3 - 3.5 ft	19			19	19					
SP-11		3.5 - 4 ft	16			16	16					
SP-11		4 - 4.5 ft	<12			0	0					
SP-11		4.5 - 5 ft	18			18	18					
SP-11		5 - 6 ft	22			22	22					
SP-11		6 - 7 ft	30			30	30					
SP-11		7 - 8 ft	18			18	18					
SP-11		8 - 9 ft	<19			0	0					
SP-11		9 - 10 ft	13			13	13					

High Limit 1500 87 = Number a
Average Limit 1000 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-12		0-6 in	719			719	719		1090		
SP-12		6 - 12 in	766			766	766		1090		
SP-12		12 - 18 in	286			286	286		1090		
SP-12		18 - 24 in	219			219	219		1090		
SP-12		2 - 2.5 ft	89			89	89				
SP-12		2.5 - 3 ft	40			40	40				
SP-12		3 - 3.5 ft	<15			0	0				
SP-12		3.5 - 4 ft	<22			0	0				
SP-12		4 - 4.5 ft	28			28	28				
SP-12		4.5 - 5 ft	17			17	17				
SP-12		5 - 6 ft	<21			0	0				
SP-12		6 - 7 ft	<16			0	0				
SP-12		7 - 8 ft	<20			0	0				
SP-12		8 - 9 ft	<15			0	0				
SP-12		9 - 10 ft	<13			0	0				
SP-13		0-6 in	1864			**1864**	**1864**		2420		
SP-13		6 - 12 in	721			721	721		2420		
SP-13		12 - 18 in	573			573	573				
SP-13		18 - 24 in	35			35	35				
SP-13		2 - 2.5 ft	15			15	15				
SP-13		2.5 - 3 ft	<12			0	0				
SP-13		3 - 3.5 ft	12			12	12				
SP-13		3.5 - 4 ft	14			14	14				
SP-13		4 - 4.5 ft	12			12	12				
SP-13		4.5 - 5 ft	45			45	45				
SP-13		5 - 6 ft	23			23	23				
SP-13		6 - 7 ft	75			75	75				
SP-13		7 - 8 ft	<14			0	0				
SP-13		8 - 9 ft	41			41	41				
SP-13		9 - 10 ft	175			175	175				
SP-14		0-6 in	885			885	885				
SP-14		6 - 12 in	681			681	681				
SP-14		12 - 18 in	990			990	990		573		
SP-14		18 - 24 in	161			161	161		573		
SP-14		2 - 2.5 ft	54			54	54		2140		
SP-14		2.5 - 3 ft	22			22	22		2140		
SP-14		3 - 3.5 ft	14			14	14				
SP-14		3.5 - 4 ft	<12			0	0				
SP-14		4 - 4.5 ft	<10			0	0				
SP-14		4.5 - 5 ft	14			14	14				
SP-14		5 - 6 ft	465			465	465				
SP-14		6 - 7 ft	14			14	14				
SP-14		7 - 8 ft	11			11	11				
SP-14		8 - 9 ft	14			14	14				
SP-14		9 - 10 ft	<10			0	0				
SP-15		0-6 in	1107			1107	**1107**		140		
SP-15		6 - 12 in	320			320	320		140		
SP-15		12 - 18 in	175			175	175		140		
SP-15		18 - 24 in	172			172	172		140		
SP-15		2 - 2.5 ft	71			71	71				
SP-15		2.5 - 3 ft	77			77	77				
SP-15		3 - 3.5 ft	29			29	29				
SP-15		3.5 - 4 ft	72			72	72				
SP-15		4 - 4.5 ft	<14			0	0				
SP-15		4.5 - 5 ft	72			72	72				
SP-15		5 - 6 ft	29			29	29				
SP-15		6 - 7 ft	118			118	118				
SP-15		7 - 8 ft	19			19	19				
SP-15		8 - 9 ft	<14			0	0				
SP-15		9 - 10 ft	<10			0	0				

									High Limit	1500		87 = Number a
			XRF Results			XRF Results			Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?		Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-16		0-6 in	25			25	25			28.7		
SP-16		6 - 12 in	57			57	57			28.7		
SP-16		12 - 18 in	41			41	41			28.7		
SP-16		18 - 24 in	33			33	33			28.7		
SP-16		2 - 2.5 ft	40			40	40					
SP-16		2.5 - 3 ft	43			43	43					
SP-16		3 - 3.5 ft	44			44	44					
SP-16		3.5 - 4 ft	<18			0	0					
SP-16		4 - 4.5 ft	18			18	18					
SP-16		4.5 - 5 ft	16			16	16					
SP-16		5 - 6 ft	20			20	20					
SP-16		6 - 7 ft	60			60	60					
SP-16		7 - 8 ft	<10			0	0					
SP-16		8 - 9 ft	54			54	54					
SP-16		9 - 10 ft	<12			0	0					
SP-17		0-6 in	424			424	424			517		
SP-17		6 - 12 in	241			241	241			517		
SP-17		12 - 18 in				0	0			517		
SP-17		18 - 24 in	15			15	15			517		
SP-17		2 - 2.5 ft				0	0					
SP-17		2.5 - 3 ft	17			17	17					
SP-17		3 - 3.5 ft				0	0					
SP-17		3.5 - 4 ft	65			65	65					
SP-17		4 - 4.5 ft				0	0					
SP-17		4.5 - 5 ft	105			105	105					
SP-17		5 - 6 ft	<18			0	0					
SP-17		6 - 7 ft	<11			0	0					
SP-17		7 - 8 ft	12			12	12					
SP-17		8 - 9 ft	15			15	15					
SP-17		9 - 10 ft	16			16	16					
SP-18		0-6 in	380			380	380			91.4		
SP-18		6 - 12 in	<19			0	0			91.4		
SP-18		12 - 18 in	238			238	238			91.4		
SP-18		18 - 24 in	196			196	196			91.4		
SP-18		2 - 2.5 ft	25			25	25					
SP-18		2.5 - 3 ft	<15			0	0					
SP-18		3 - 3.5 ft	15			15	15					
SP-18		3.5 - 4 ft	<10			0	0					
SP-18		4 - 4.5 ft	<14			0	0					
SP-18		4.5 - 5 ft				0	0					
SP-18		5 - 6 ft	<18			0	0					
SP-18		6 - 7 ft				0	0					
SP-18		7 - 8 ft	<11			0	0					
SP-18		8 - 9 ft				0	0					
SP-18		9 - 10 ft				0	0					
SP-19		0-6 in	341			341	341			162		
SP-19		6 - 12 in	367			367	367			162		
SP-19		12 - 18 in	237			237	237			162		
SP-19		18 - 24 in	35			35	35			162		
SP-19		2 - 2.5 ft	<20			0	0					
SP-19		2.5 - 3 ft	16			16	16					
SP-19		3 - 3.5 ft	11			11	11					
SP-19		3.5 - 4 ft	16			16	16					
SP-19		4 - 4.5 ft	13			13	13					
SP-19		4.5 - 5 ft	13			13	13					
SP-19		5 - 6 ft	<13			0	0					
SP-19		6 - 7 ft	<9			0	0					
SP-19		7 - 8 ft	<15			0	0					
SP-19		8 - 9 ft	<10			0	0					
SP-19		9 - 10 ft	13			13	13					

								High Limit	1500		87 = Number a
			XRF Results			XRF Results		Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run	High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-20		0-6 in	130			130	130		162		
SP-20		6 - 12 in	169			169	169		162		
SP-20		12 - 18 in	78			78	78		162		
SP-20		18 - 24 in	17			17	17		162		
SP-20		2 - 2.5 ft	22			22	22				
SP-20		2.5 - 3 ft	<15			0	0				
SP-20		3 - 3.5 ft	<10			0	0				
SP-20		3.5 - 4 ft	<13			0	0				
SP-20		4 - 4.5 ft	<12			0	0				
SP-20		4.5 - 5 ft	24			24	24				
SP-20		5 - 6 ft	15			15	15				
SP-20		6 - 7 ft	20			20	20				
SP-20		7 - 8 ft	<13			0	0				
SP-20		8 - 9 ft	13			13	13				
SP-20		9 - 10 ft	11			11	11				
SP-21		0-6 in	855			855	855				
SP-21		6 - 12 in	1298			1298	**1298**		295		
SP-21		12 - 18 in	128			128	128				
SP-21		18 - 24 in	15			15	15				
SP-21		2 - 2.5 ft	78			78	78				
SP-21		2.5 - 3 ft	29			29	29				
SP-21		3 - 3.5 ft	12			12	12				
SP-21		3.5 - 4 ft	7			7	7				
SP-21		4 - 4.5 ft	12			12	12				
SP-21		4.5 - 5 ft	13			13	13				
SP-21		5 - 6 ft	10			10	10				
SP-22		0-6 in	86			86	86				
SP-22		6 - 12 in	102			102	102				
SP-22		12 - 18 in	49			49	49				
SP-22		18 - 24 in	55			55	55				
SP-22		2 - 2.5 ft	446			446	446		154		
SP-22		2.5 - 3 ft	114			114	114				
SP-22		3 - 3.5 ft	90			90	90				
SP-22		3.5 - 4 ft	64			64	64				
SP-22		4 - 4.5 ft	7			7	7				
SP-22		4.5 - 5 ft	10			10	10				
SP-23		0-6 in	777			777	777		365		
SP-23		6 - 12 in	64			64	64				
SP-23		12 - 18 in	283			283	283				
SP-23		18 - 24 in	91			91	91				
SP-23		2 - 2.5 ft	136			136	136				
SP-23		2.5 - 3 ft	51			51	51				
SP-23		3 - 3.5 ft	14			14	14				
SP-23		3.5 - 4 ft	13			13	13				
SP-23		4 - 4.5 ft	11			11	11				
SP-23		4.5 - 5 ft	8			8	8				
SP-23		5 - 6 ft	ND			0	0				
SP-23		6 - 7 ft	8			8	8				

High Limit 1500 — 87 = Number a
Average Limit 1000 — 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	2nd Run	3rd Run	XRF Results High	Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-24		0-6 in	278			278	278		177		
SP-24		6 - 12 in	402			402	402		177		
SP-24		12 - 18 in	396			396	396				
SP-24		18 - 24 in	236			236	236				
SP-24		2 - 2.5 ft	19			19	19				
SP-24		2.5 - 3 ft	20			20	20				
SP-24		3 - 3.5 ft	7			7	7				
SP-24		3.5 - 4 ft	15			15	15				
SP-24		4 - 4.5 ft	10			10	10				
SP-24		4.5 - 5 ft	11			11	11				
SP-24		5 - 6 ft	9			9	9				
SP-24		6 - 7 ft	11			11	11				
SP-24		7 - 8 ft	ND			0	0				
SP-24		8 - 9 ft	ND			0	0				
SP-24		9 - 10 ft	14			14	14				
SP-24		11 - 12 ft	ND			0	0				
SP-24		12 - 13 ft	ND			0	0				
SP-24		13 - 14 ft	ND			0	0				
SP-24		14 - 15 ft	ND			0	0				
SP-24		15 - 16 ft	ND			0	0				
SP-24		16 - 17 ft	ND			0	0				
SP-24		17 - 18 ft	ND			0	0				
SP-25		0-6 in	804			804	804				
SP-25		6 - 12 in	1222			1222	**1222**		239		
SP-25		12 - 18 in	197			197	197				
SP-25		18 - 24 in	87			87	87				
SP-25		2 - 2.5 ft	80			80	80				
SP-25		2.5 - 3 ft	19			19	19				
SP-25		3 - 3.5 ft	19			19	19				
SP-25		3.5 - 4 ft	33			33	33				
SP-25		4 - 4.5 ft	9			9	9				
SP-25		4.5 - 5 ft	6			6	6				
SP-25		5 - 6 ft	ND			0	0				
SP-25		6 - 7 ft	ND			0	0				
SP-26		0-6 in	408			408	408		197		
SP-26		6 - 12 in	219			219	219				
SP-26		12 - 18 in	25			25	25				
SP-26		18 - 24 in	33			33	33				
SP-26		2 - 2.5 ft	20			20	20				
SP-26		2.5 - 3 ft	15			15	15				
SP-26		3 - 3.5 ft	7			7	7				
SP-26		3.5 - 4 ft	11			11	11				
SP-26		4 - 4.5 ft	14			14	14				
SP-26		4.5 - 5 ft	6			6	6				
SP-26		5 - 6 ft	ND			0	0				
SP-26		6 - 7 ft	ND			0	0				
SP-26		7 - 8 ft	18			18	18				
SP-26		8 - 9 ft	8			8	8				
SP-26		9 - 10 ft	10			10	10				
SP-26		10 - 11 ft	ND			0	0		2.3		
SP-26		11 - 12 ft	ND			0	0		2.3		
SP-26		12 - 13 ft	ND			0	0		2.3		
SP-26		13 - 14 ft	ND			0	0		2.3		
SP-26		14 - 15 ft	ND			0	0		2.3		
SP-26		15 - 16 ft	ND			0	0				

High Limit 1500 | 87 = Number a
Average Limit 1000 | 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-27		0-6 in	1509			**1509**	**1509**		610		
SP-27		6 - 12 in	299			299	299		437		
SP-27		12 - 18 in	55			55	55				
SP-27		18 - 24 in	18			18	18				
SP-27		2 - 2.5 ft	18			18	18				
SP-27		2.5 - 3 ft	12			12	12				
SP-27		3 - 3.5 ft	13			13	13				
SP-27		3.5 - 4 ft	12			12	12				
SP-27		4 - 4.5 ft	15			15	15				
SP-27		4.5 - 5 ft	11			11	11				
SP-28		0-6 in	66			66	66		53.1		
SP-28		6 - 12 in	26			26	26		53.1		
SP-28		12 - 18 in	39			39	39				
SP-28		18 - 24 in	7			7	7				
SP-28		2 - 2.5 ft	11			11	11				
SP-28		2.5 - 3 ft	14			14	14				
SP-28		3 - 3.5 ft	8			8	8				
SP-28		3.5 - 4 ft	11			11	11				
SP-28		4 - 4.5 ft	ND			0	0				
SP-28		4.5 - 5 ft	ND			0	0				
SP-29		0-6 in	200			200	200				
SP-29		6 - 12 in	53			53	53				
SP-29		12 - 18 in	251			251	251		84.4		
SP-29		18 - 24 in	22			22	22				
SP-29		2 - 2.5 ft	6			6	6				
SP-29		2.5 - 3 ft	9			9	9				
SP-29		3 - 3.5 ft	7			7	7				
SP-29		3.5 - 4 ft	9			9	9				
SP-29		4 - 4.5 ft	12			12	12				
SP-29		4.5 - 5 ft	13			13	13				
SP-30		0-6 in	555			555	555				
SP-30		6 - 12 in	239			239	239				
SP-30		12 - 18 in	856			856	856				
SP-30		18 - 24 in	6790			**6790**	**6790**		13900		
SP-30		2 - 2.5 ft	275			275	275				
SP-30		2.5 - 3 ft	46			46	46				
SP-30		3 - 3.5 ft	26			26	26				
SP-30		3.5 - 4 ft	12			12	12				
SP-30		4 - 4.5 ft	12			12	12				
SP-30		4.5 - 5 ft	10			10	10				
SP-31		0-6 in	82			82	82				
SP-31		6 - 12 in	473			473	473		247		
SP-31		12 - 18 in	54			54	54				
SP-31		18 - 24 in	24			24	24				
SP-31		2 - 2.5 ft	16			16	16				
SP-31		2.5 - 3 ft	14			14	14				
SP-31		3 - 3.5 ft	17			17	17				
SP-31		3.5 - 4 ft	8			8	8				
SP-31		4 - 4.5 ft	13			13	13				
SP-31		4.5 - 5 ft	ND			0	0				

EXIDE Soil

XRF results / Labratory Results / TCLP Results

High Limit 1500 | 87 = Number a

Average Limit 1000 | 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-32		0-6 in	54			54	54				
SP-32		6 - 12 in	ND			0	0				
SP-32		12 - 18 in	25			25	25				
SP-32		18 - 24 in	ND			0	0				
SP-32		2 - 2.5 ft	ND			0	0				
SP-32		2.5 - 3 ft	ND			0	0				
SP-32		3 - 3.5 ft	ND			0	0				
SP-32		3.5 - 4 ft	ND			0	0				
SP-32		4 - 4.5 ft	46			46	46		57.4		
SP-32		4.5 - 5 ft	ND			0	0		57.4		
SP-33		0-6 in	ND			0	0				
SP-33		6 - 12 in	11			11	11				
SP-33		12 - 18 in	40			40	40		10.2		
SP-33		18 - 24 in	16			16	16		10.2		
SP-33		2 - 2.5 ft	15			15	15				
SP-33		2.5 - 3 ft	ND			0	0				
SP-33		3 - 3.5 ft	ND			0	0				
SP-33		3.5 - 4 ft	11			11	11				
SP-33		4 - 4.5 ft	19			19	19				
SP-33		4.5 - 5 ft	ND			0	0				
SP-34		0-6 in	83			83	83				
SP-34		6 - 12 in	47			47	47				
SP-34		12 - 18 in	11			11	11				
SP-34		18 - 24 in	184			184	184				
SP-34		2 - 2.5 ft	216			216	216				
SP-34		2.5 - 3 ft	279			279	279				
SP-34		3 - 3.5 ft	375			375	375		359		
SP-34		3.5 - 4 ft	N			0	0		359		
SP-34		4 - 4.5 ft	59			59	59				
SP-34		4.5 - 5 ft	ND			0	0				
SP-35		0-6 in	444			444	444		101		
SP-35		6 - 12 in	300			300	300				
SP-35		12 - 18 in	160			160	160				
SP-35		18 - 24 in	134			134	134				
SP-35		2 - 2.5 ft	25			25	25				
SP-35		2.5 - 3 ft	12			12	12				
SP-35		3 - 3.5 ft	9			9	9				
SP-35		3.5 - 4 ft	7			7	7				
SP-35		4 - 4.5 ft	8			8	8				
SP-35		4.5 - 5 ft	12			12	12				
SP-36		0-6 in	1192			1192	**1192**		141		
SP-36		6 - 12 in	70			70	70				
SP-36		12 - 18 in	293			293	293				
SP-36		18 - 24 in	129			129	129				
SP-36		2 - 2.5 ft	126			126	126				
SP-36		2.5 - 3 ft	9			9	9				
SP-36		3 - 3.5 ft	9			9	9				
SP-36		3.5 - 4 ft	8			8	8				
SP-36		4 - 4.5 ft	ND			0	0				
SP-36		4.5 - 5 ft	12			12	12				

EXIDE Soil

XRF results / Labratory Results / TCLP Results

										High Limit	1500		87 = Number a
			XRF Results				XRF Results			Average Limit	1000		83 = Number a
Probe / Location		Depth Interval	1st Run	2nd Run	3rd Run		High	Average	analyze?		Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-37		0-6 in	18				18	18					
SP-37		6 - 12 in	37				37	37					
SP-37		12 - 18 in	25				25	25					
SP-37		18 - 24 in	25				25	25					
SP-37		2 - 2.5 ft	184				184	184					
SP-37		2.5 - 3 ft	153				153	153					
SP-37		3 - 3.5 ft	333				333	333			474		
SP-37		3.5 - 4 ft	ND				0	0			474		
SP-37		4 - 4.5 ft	ND				0	0					
SP-37		4.5 - 5 ft	15				15	15					
SP-38		0-6 in	85				85	85			250		
SP-38		6 - 12 in	345				345	345			250		
SP-38		12 - 18 in	132				132	132					
SP-38		18 - 24 in	166				166	166					
SP-38		2 - 2.5 ft	20				20	20					
SP-38		2.5 - 3 ft	8				8	8					
SP-38		3 - 3.5 ft	7				7	7					
SP-38		3.5 - 4 ft	11				11	11					
SP-38		4 - 4.5 ft	10				10	10					
SP-38		4.5 - 5 ft	10				10	10					
SP-39		0-6 in	104				104	104					
SP-39		6 - 12 in	71				71	71					
SP-39		12 - 18 in	21				21	21					
SP-39		18 - 24 in	21				21	21					
SP-39		2 - 2.5 ft	7				7	7					
SP-39		2.5 - 3 ft	15				15	15					
SP-39		3 - 3.5 ft	11				11	11					
SP-39		3.5 - 4 ft	16				16	16					
SP-39		4 - 4.5 ft	16				16	16			11.4		
SP-39		4.5 - 5 ft	106				106	106			11.4		
SP-40		0-6 in	14				14	14					
SP-40		6 - 12 in	8				8	8					
SP-40		12 - 18 in	13				13	13					
SP-40		18 - 24 in	ND				0	0					
SP-40		2 - 2.5 ft	24				24	24			7.2		
SP-40		2.5 - 3 ft	30				30	30					
SP-40		3 - 3.5 ft	ND				0	0					
SP-40		3.5 - 4 ft	ND				0	0					
SP-40		4 - 4.5 ft	ND				0	0					
SP-40		4.5 - 5 ft	ND				0	0					
SP-41		0-6 in	ND				0	0					
SP-41		6 - 12 in	13				13	13					
SP-41		12 - 18 in	11				11	11					
SP-41		18 - 24 in	ND				0	0					
SP-41		2 - 2.5 ft	10				10	10			166		
SP-41		2.5 - 3 ft	219				219	219			166		
SP-41		3 - 3.5 ft	88				88	88					
SP-41		3.5 - 4 ft	207				207	207					
SP-41		4 - 4.5 ft	62				62	62					
SP-41		4.5 - 5 ft	45				45	45					

High Limit 1500 87 = Number a
Average Limit 1000 83 = Number a

Probe / Location		Depth Interval	XRF Results 1st Run	XRF Results 2nd Run	XRF Results 3rd Run	XRF Results High	XRF Results Average	analyze?	Soil Lead (mg/kg)	RPD XRF vs Lab	TCLP Lead (mg/L)
SP-42		0 - 1 ft		none available		0	0		865		
SP-42		1 - 2 ft		none available		0	0		520		
SP-42		2 - 3 ft		none available		0	0		205		
SP-42		3 - 4 ft		none available		0	0		13.4		
SP-42		4 - 5 ft		none available		0	0		11.8		
SP-43		0 - 1 ft		none available		0	0		205		
SP-43		0 - 1 ft Duplicate		none available		0	0		34.7		
SP-43		1 - 2 ft		none available		0	0		1760		
SP-43		2 - 3 ft		none available		0	0		68.8		
SP-43		3 - 4 ft		none available		0	0		21.6		
SP-43		4 - 5 ft		none available		0	0		9.9		
SP-44		0 - 1 ft		none available		0	0		3600		
SP-44		1 - 2 ft		none available		0	0		137		
SP-44		2 - 3 ft		none available		0	0		20		
SP-44		3 - 4 ft		none available		0	0		14.2		
SP-44		4 - 5 ft		none available		0	0		7.2		

Former Exide Corporation 303 Water St., Logansport, IN 46947

20-224 12/7-8/2020

XRF Data: Pb

Depth	Probes												
(ft)	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-13
0.5	89	76	1166	<29	1486	1087	1528	72	21	14	100	719	1864
1	77	145	835	68	374	510	389	196	106	30	92	766	721
1.5	81	43	309	109	89	325	65	1044	1281	60	68	286	573
2	<22	117	77	60	19	451	18	1337	259	84	51	219	35
2.5	42	173	145	54	166	178	<9	361	2.14%	463	<11	89	15
3	21	12	142	153	69	63	26	114	1.1%	61	14	40	<12
3.5	<34	55	53	218	43	17	16	<15	245	105	19	<15	12
4	<15	46	85	21	<12	72	29	<15	244	78	16	<22	14
4.5	89	53	127	108	<13	21	<13	<21	226	14	<12	28	12
5	<13	27	31	126	<13	318	<12	<20	155	16	18	17	45
5.5													
6	<19	<9	248	211	81	29	58	79	715	46	22	<21	23
6.5													
7	76	<12	76	<15	35	<2	<11	27	<11	<13	30	<16	75
7.5													
8	35	<16	17	<11	17	<18	35	42	<14	<16	18	<20	<14
8.5													
9	32	<15	<11	16	<16	<16	<10	18	<15	<20	<19	<15	41
9.5													
10	24	11	<9	103	23	<25	12	<14	<22	19	13	<13	175

SB-14	SB-15	SB-16	SB-17	SB-18	SB-19	SB-20	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9
885	1107	25	424	380	341	130		6643	6331	8383	6101	7216	5663	3003	6324
681	320	57	241	<19	367	169									
990	175	41		238	237	78									
161	172	33	15	196	35	17									
54	71	40		25	<20	22									
22	77	43	17	<15	16	<15									
14	29	44		15	11	<10									
<12	72	<18	65	<10	16	<13									
<10	<14	18		<14	13	<12									
14	72	16	105		13	24									
465	29	20	<18	<18	<13	15									
14	118	60	<11		<9	20									
11	19	<10	12	<11	<15	<13									
14	<14	54	15		<10	13									
<10	<10	<12	16		13	11									

XRF PRECISION
Exide Battery Site
303 Water St., Logansport, IN 46947

	A	B	Source of									Duplicate	Mean of	SD of	SD/Mean	Mean of	SD of	SD/Mean		RPD 3 vs
DUPLICATES	ppm	ppm	Replicate	3sec Replicate			30sec Replicate					RPD	3sec Reps	3sec Reps	+/-%	30sec Reps	30secReps	+/-%		30 sec Reps
SB-6 (3')	48	55	B	24	36	37	43	48	53			14%	38	13	34%	48	5	10%		23%
SB-6 (3')	67	56										18%								
SB-7 (3')	18	17	A	25	18	17	22.1	24.1	12.2			6%	20	4	19%	19	6	33%		0%
SB-7 (3')	17	19										11%								
SB-8 (2.5')	337	360	B	368	350	429	431	449	449			7%	377	36	9%	443	10	2%		16%
SB-8 (2.5')	208	282										30%								
SB-9 (4.5')	320	171	A	227	295	233	242	247	258			61%	269	46	17%	249	8	3%		8%
SB-9 (4.5')	176	160										10%								
SB-10 (3.5')	107	71	B	86	83	64	115	100	110			40%	76	10	14%	108	8	7%		35%
SB-10 (3.5')	69	77										11%								
SB-11 (4')	12	10	A	12	13	15	16	16	14			18%	13	1	11%	15	1	8%		16%
SB-11 (4')	11	14										24%								
SB-12 (3')	126	107	B	114	127	135	141	137	141			16%	121	13	10%	140	2	2%		15%
SB-12 (3')	158	156										1%								
SB-15 (3')	13	21	A	15	21	12	8.7	8.2	10.1			47%	15	4	26%	9	1	11%		52%
SB-15 (3')	22	26										17%								
SB-17 (0.5')	181	556										102%								
SB-20 (1')	360	409										13%								

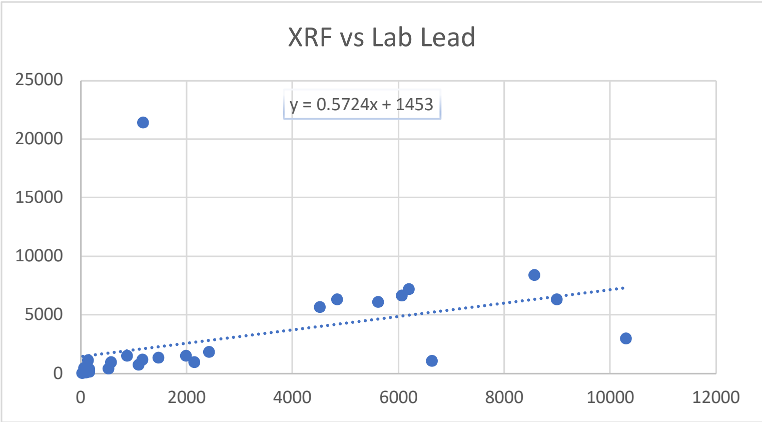
SB-16 BLANK
SiO2: -7
RCRApp Metals: 479

Mean of RPDs		25%									
% RPDs <35%		78%									
Mean					18%			9%		21%	

COMPARISON OF FIELD XRF TO LABORATORY ANALYSES

Project ID	Sample ID	Units	Lead	XRF
	CAS Number		7439-92-1	
Former Exide 20-224	SB-1 0-1'	mg/kg	85.4	89
Former Exide 20-224	SB-2 0-1'	mg/kg	70.4	145
Former Exide 20-224	SB-3 0-1'	mg/kg	1160	1166
Former Exide 20-224	SB-4 3-4'	mg/kg	125	218
Former Exide 20-224	SB-5 0-1'	mg/kg	873	1486
Former Exide 20-224	SB-6 0-2'	mg/kg	6630	1087
Former Exide 20-224	SB-7 0-2'	mg/kg	1990	1528
Former Exide 20-224	SB-8 0-2'	mg/kg	1470	1337
Former Exide 20-224	SB-9 2-4'	mg/kg	1170	21400
Former Exide 20-224	SB-10 2-4'	mg/kg	57.3	463
Former Exide 20-224	SB-11 0-2'	mg/kg	95.6	100
Former Exide 20-224	SB-12 0-2'	mg/kg	1090	766
Former Exide 20-224	SB-13 0-1'	mg/kg	2420	1864
Former Exide 20-224	SB-14 1-2'	mg/kg	573	990
Former Exide 20-224	SB-14 1-2' DUP	mg/kg	2140	990
Former Exide 20-224	SB-15 0-2'	mg/kg	140	1107
Former Exide 20-224	SB-16 0-2'	mg/kg	28.7	57
Former Exide 20-224	SB-17 0-2'	mg/kg	517	424
Former Exide 20-224	SB-18 0-2'	mg/kg	91.4	318
Former Exide 20-224	SB-19 0-2'	mg/kg	162	367
Former Exide 20-224	SB-20 0-2'	mg/kg	162	169
Former Exide 20-224	SS-2	mg/kg	6070	6643
Former Exide 20-224	SS-3	mg/kg	9000	6331
Former Exide 20-224	SS-4	mg/kg	8570	8383
Former Exide 20-224	SS-5	mg/kg	5620	6101
Former Exide 20-224	SS-6	mg/kg	6200	7216
Former Exide 20-224	SS-7	mg/kg	4510	5663
Former Exide 20-224	SS-8	mg/kg	10300	3003
Former Exide 20-224	SS-9	mg/kg	4840	6324

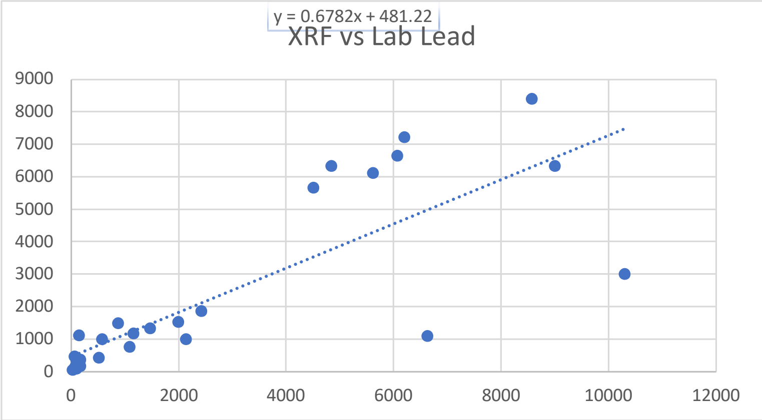
$r^2 =$ 0.407688



COMPARISON OF FIELD XRF TO LABORATORY ANALYSES

Project ID	Sample ID	Units	Lead	XRF
	CAS Number		7439-92-1	
Former Exide 20-224	SB-1 0-1'	mg/kg	85.4	89
Former Exide 20-224	SB-2 0-1'	mg/kg	70.4	145
Former Exide 20-224	SB-3 0-1'	mg/kg	1160	1166
Former Exide 20-224	SB-4 3-4'	mg/kg	125	218
Former Exide 20-224	SB-5 0-1'	mg/kg	873	1486
Former Exide 20-224	SB-6 0-2'	mg/kg	6630	1087
Former Exide 20-224	SB-7 0-2'	mg/kg	1990	1528
Former Exide 20-224	SB-8 0-2'	mg/kg	1470	1337
Former Exide 20-224	SB-9 2-4'	mg/kg		
Former Exide 20-224	SB-10 2-4'	mg/kg	57.3	463
Former Exide 20-224	SB-11 0-2'	mg/kg	95.6	100
Former Exide 20-224	SB-12 0-2'	mg/kg	1090	766
Former Exide 20-224	SB-13 0-1'	mg/kg	2420	1864
Former Exide 20-224	SB-14 1-2'	mg/kg	573	990
Former Exide 20-224	SB-14 1-2' DUP	mg/kg	2140	990
Former Exide 20-224	SB-15 0-2'	mg/kg	140	1107
Former Exide 20-224	SB-16 0-2'	mg/kg	28.7	57
Former Exide 20-224	SB-17 0-2'	mg/kg	517	424
Former Exide 20-224	SB-18 0-2'	mg/kg	91.4	318
Former Exide 20-224	SB-19 0-2'	mg/kg	162	367
Former Exide 20-224	SB-20 0-2'	mg/kg	162	169
Former Exide 20-224	SS-2	mg/kg	6070	6643
Former Exide 20-224	SS-3	mg/kg	9000	6331
Former Exide 20-224	SS-4	mg/kg	8570	8383
Former Exide 20-224	SS-5	mg/kg	5620	6101
Former Exide 20-224	SS-6	mg/kg	6200	7216
Former Exide 20-224	SS-7	mg/kg	4510	5663
Former Exide 20-224	SS-8	mg/kg	10300	3003
Former Exide 20-224	SS-9	mg/kg	4840	6324

$r^2 =$ 0.807479



Former Exide Corporation 303 Water St., Logansport, IN 46947

22-104 3/30/2022-4/1/2022

XRF Data: Pb

Depth	Probes																				
(ft)	SB-21	SB-22	SB-23	SB-24	SB-25	SB-26	SB-27	SB-28	SB-29	SB-30	SB-31	SB-32	SB-33	SB-34	SB-35	SB-36	SB-37	SB-38	SB-39	SB-40	SB-41
0.5	855	86	777	278	804	408	1509	66	200	555	82	54	ND	83	444	1192	18	85	104	14	ND
1	1298	102	64	402	1222	219	299	26	53	239	473	ND	11	47	300	70	37	345	71	8	13
1.5	128	49	283	396	197	25	55	39	251	856	54	25	40	11	160	293	25	132	21	13	11
2	15	55	91	236	87	33	18	7	22	6790	24	ND	16	184	134	129	25	166	21	ND	ND
2.5	78	446	136	19	80	20	18	11	6	275	16	ND	15	216	25	126	184	20	7	24	10
3	29	114	51	20	19	15	12	14	9	46	14	ND	ND	279	12	9	153	8	15	30	219
3.5	12	90	14	7	19	7	13	8	7	26	17	ND	ND	375	9	9	333	7	11	ND	88
4	7	64	13	15	33	11	12	11	9	12	8	ND	11	N	7	8	ND	11	16	ND	207
4.5	12	7	11	10	9	14	15	ND	12	12	13	46	19	59	8	ND	ND	10	16	ND	62
5	13	10	8	11	6	6	11	ND	13	10	ND	ND	ND	ND	12	12	15	10	106	ND	45
6	10		ND	9	ND	ND															
7			8	11	ND	ND															
8				ND		18															
9				ND		8															
10				14		10															
11				ND		ND															
12				ND		ND															
13				ND		ND															
14				ND		ND															
15				ND		ND															
16				ND		ND															
17				ND																	

XRF PRECISION
Exide Battery Site
303 Water St., Logansport, IN 46947

		A	Duplicate 1	Duplicate 2	Replicate				Duplicate 1	Duplicate 2	Mean of	RPD REP
	DUPLICATES	ppm	ppm	ppm	1	**2**	**3**		RPD	RPD	Reps	vs A
1	SB-21:4.5-5	**12.10**	**11.3**	N/A	**8.5**	N/A	N/A		7%	N/A	8.50	35%
2	SB-25:0-0.5	**804.5**	N/A	N/A	**822.4**	N/A	N/A		N/A	N/A	822.40	2%
3	SB-26:2.5-3	**15**	N/A	N/A	**10**	N/A	N/A		N/A	N/A	10.00	40%
4	SB-27:4.5-5	**11.1**	**10.2**	N/A	N/A	N/A	N/A		8%	N/A	N/A	N/A
5	SB-28:2.5-3	**14.2**	N/A	N/A	**8.5**	N/A	N/A		N/A	N/A	8.50	50%
6	SB-33:4-4.5	**19.2**	**12.7**	N/A	**16.3**	N/A	N/A		41%	N/A	16.30	16%
7	SB-34:4.5-5	**59.4**	**76.1**	N/A	N/A	N/A	N/A		25%	N/A	N/A	N/A
8	SB-36:0-0.5	**370.9**	N/A	N/A	**1191.9**	N/A	N/A		N/A	N/A	1191.90	105%
9	SB-36:1-1.5	**16.1**	N/A	N/A	**7.9**	N/A	N/A		N/A	N/A	7.90	68%
10	SB-36:4.5-5	**12.4**	**11.1**	**53.3**	N/A	N/A	N/A		11%	125%	N/A	N/A
11	SB-37:0.5-1	**36.6**	**10.6**	N/A	**15.2**	N/A	N/A		110%	N/A	15.20	83%
12	SB-39:0.5-1	**71.5**	N/A	N/A	**40.1**	N/A	N/A		N/A	N/A	40.10	56%
13	SB-41:4-4.5	**45**	N/A	N/A	**18.3**	**19.2**	**24.9**		N/A	N/A	18.75	82%

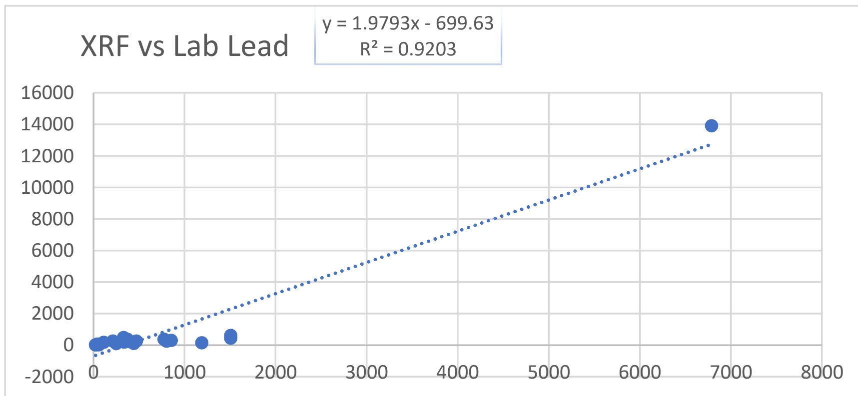
Mean of RPDs		34%	125%	213.96	54%
% RPDs <50%		83%			50%

COMPARISON OF FIELD XRF TO LABORATORY ANALYSES

Project ID	Sample ID	Units	**Lead**	**XRF**
	CAS Number		7439-92-1	
Former Exide 22-104	SB-21 0.5-1'	mg/kg	**295**	**855**
Former Exide 22-104	SB-22 2-2.5'	mg/kg	**154**	**446**
Former Exide 22-104	SB-23 0-0.5'	mg/kg	**365**	**777**
Former Exide 22-104	SB-24 0-1'	mg/kg	**177**	**340**
Former Exide 22-104	SB-25 0.5-1'	mg/kg	**239**	**804**
Former Exide 22-104	SB-26 0-0.5'	mg/kg	**197**	**408**
Former Exide 22-104	SB-27 0-0.5'	mg/kg	**610**	**1509**
Former Exide 22-104	SB-27 0-0.5' DUP	mg/kg	**437**	**1509**
Former Exide 22-104	SB-28 0-1'	mg/kg	**53.1**	**46**
Former Exide 22-104	SB-29 0-0.5'	mg/kg	**84.4**	**251**
Former Exide 22-104	SB-30 1.5-2'	mg/kg	**13900**	**6790**
Former Exide 22-104	SB-31 0.5-1'	mg/kg	**247**	**473**
Former Exide 22-104	SB-32 4-5	mg/kg	**57.4**	**46**
Former Exide 22-104	SB-33 1-2'	mg/kg	**10.2**	**28**
Former Exide 22-104	SB-34 3-4'	mg/kg	**359**	**375**
Former Exide 22-104	SB-35 0-0.5'	mg/kg	**101**	**444**
Former Exide 22-104	SB-36 0-0.5'	mg/kg	**141**	**1192**
Former Exide 22-104	SB-37 3-4'	mg/kg	**474**	**333**
Former Exide 22-104	SB-38 0-1'	mg/kg	**250**	**215**
Former Exide 22-104	SB-39 4-5'	mg/kg	**11.4**	**61**
Former Exide 22-104	SB-40 2-2.5'	mg/kg	**7.2**	**24**
Former Exide 22-104	SB-41 2-3'	mg/kg	**166**	**114.5**

$r =$ 0.959307

$r^2 =$ 0.920269



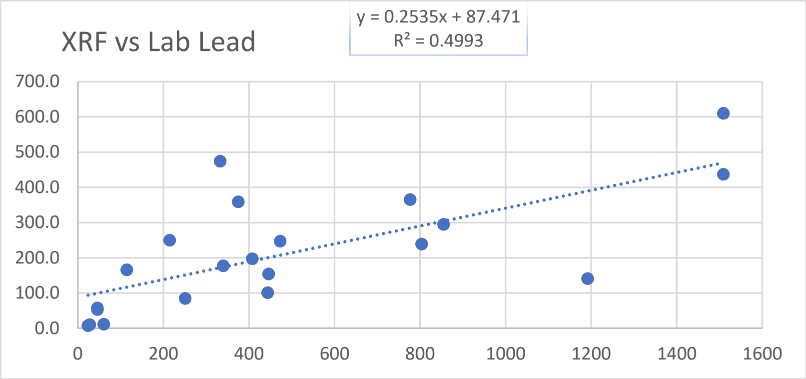
Notes:
Samples alyzed using EPA Method 6010
mg/kg = milligrams per kilogram

COMPARISON OF FIELD XRF TO LABORATORY ANALYSES

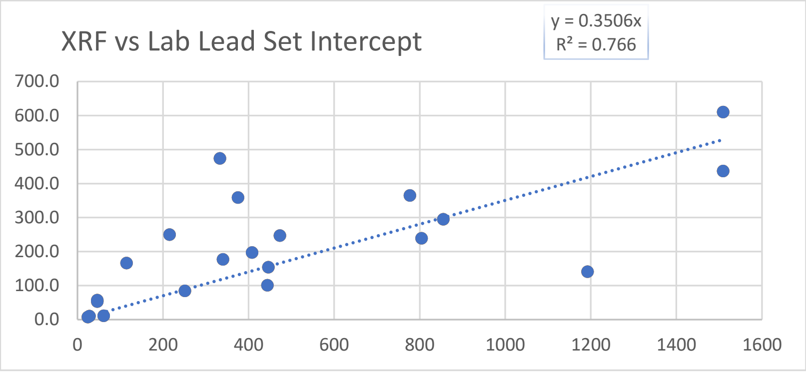
Project ID	Sample ID	Units	**Lead**	**XRF**
	CAS Number		7439-92-1	
Former Exide 22-104	SB-21 0.5-1'	mg/kg	**295.0**	**855**
Former Exide 22-104	SB-22 2-2.5'	mg/kg	**154.00**	**446**
Former Exide 22-104	SB-23 0-0.5'	mg/kg	**365**	**777**
Former Exide 22-104	SB-24 0-1'	mg/kg	**177**	**340**
Former Exide 22-104	SB-25 0.5-1'	mg/kg	**239**	**804**
Former Exide 22-104	SB-26 0-0.5'	mg/kg	**197**	**408**
Former Exide 22-104	SB-27 0-0.5'	mg/kg	**610**	**1509**
Former Exide 22-104	SB-27 0-0.5' DUP	mg/kg	**437**	**1509**
Former Exide 22-104	SB-28 0-1'	mg/kg	**53.1**	**46**
Former Exide 22-104	SB-29 0-0.5'	mg/kg	**84.4**	**251**
Former Exide 22-104	SB-30 1.5-2'	mg/kg		
Former Exide 22-104	SB-31 0.5-1'	mg/kg	**247**	**473**
Former Exide 22-104	SB-32 4-5	mg/kg	**57.4**	**46**
Former Exide 22-104	SB-33 1-2'	mg/kg	**10.2**	**28**
Former Exide 22-104	SB-34 3-4'	mg/kg	**359**	**375**
Former Exide 22-104	SB-35 0-0.5'	mg/kg	**101**	**444**
Former Exide 22-104	SB-36 0-0.5'	mg/kg	**141**	**1192**
Former Exide 22-104	SB-37 3-4'	mg/kg	**474**	**333**
Former Exide 22-104	SB-38 0-1'	mg/kg	**250**	**215**
Former Exide 22-104	SB-39 4-5'	mg/kg	**11.4**	**61**
Former Exide 22-104	SB-40 2-2.5'	mg/kg	**7.2**	**24**
Former Exide 22-104	SB-41 2-3'	mg/kg	**166**	**114.5**

Notes:
Samples alyzed using EPA Method 6010
mg/kg = milligrams per kilogram

r = 0.7066
r^2 = 0.4993

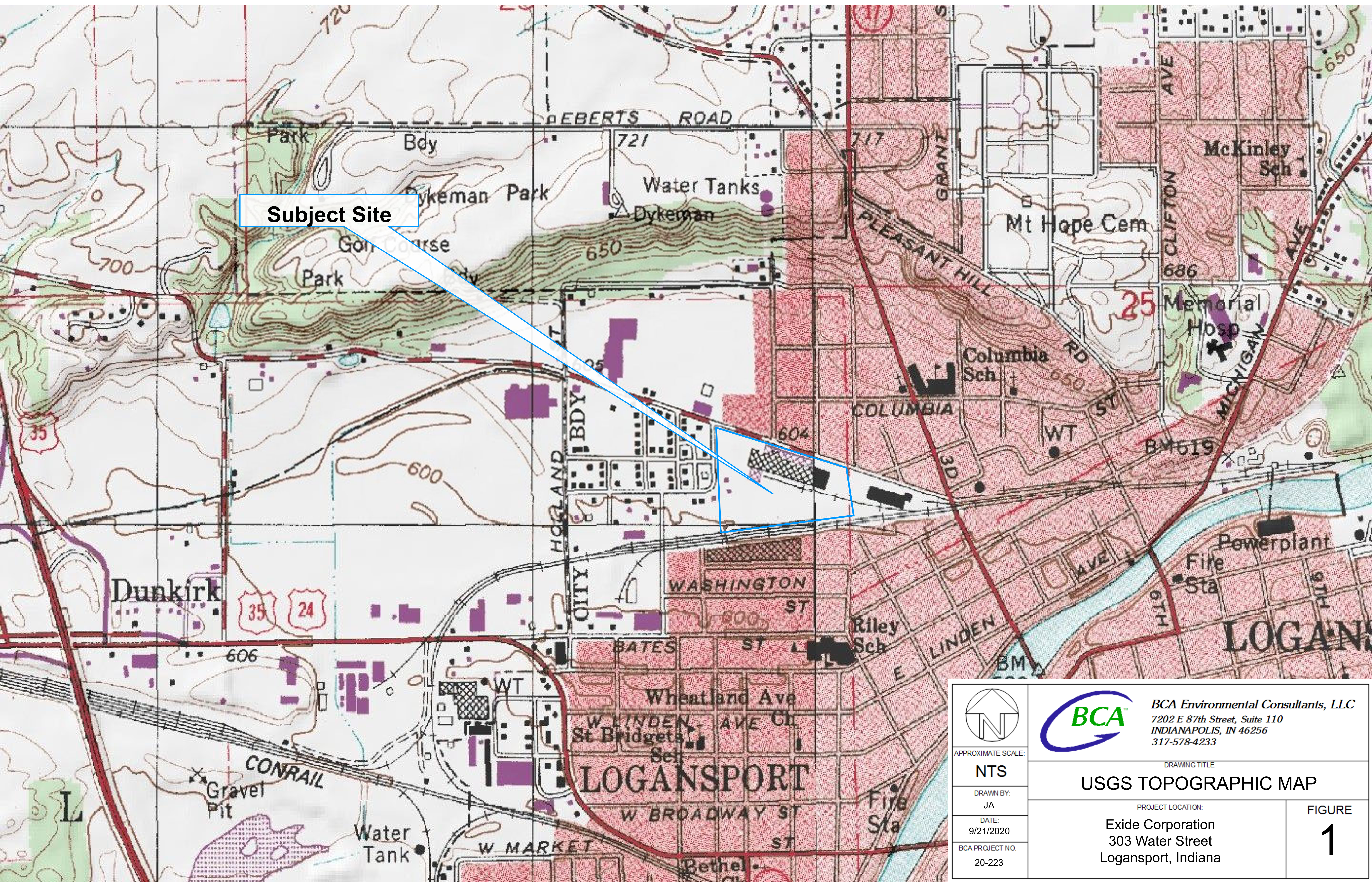


Intercept = 0,0
r = 0.875214
r^2 = 0.766



Figures

Phase II Environmental Site Assessment
Former Exide Corporation
303 Water Street
Logansport, IN



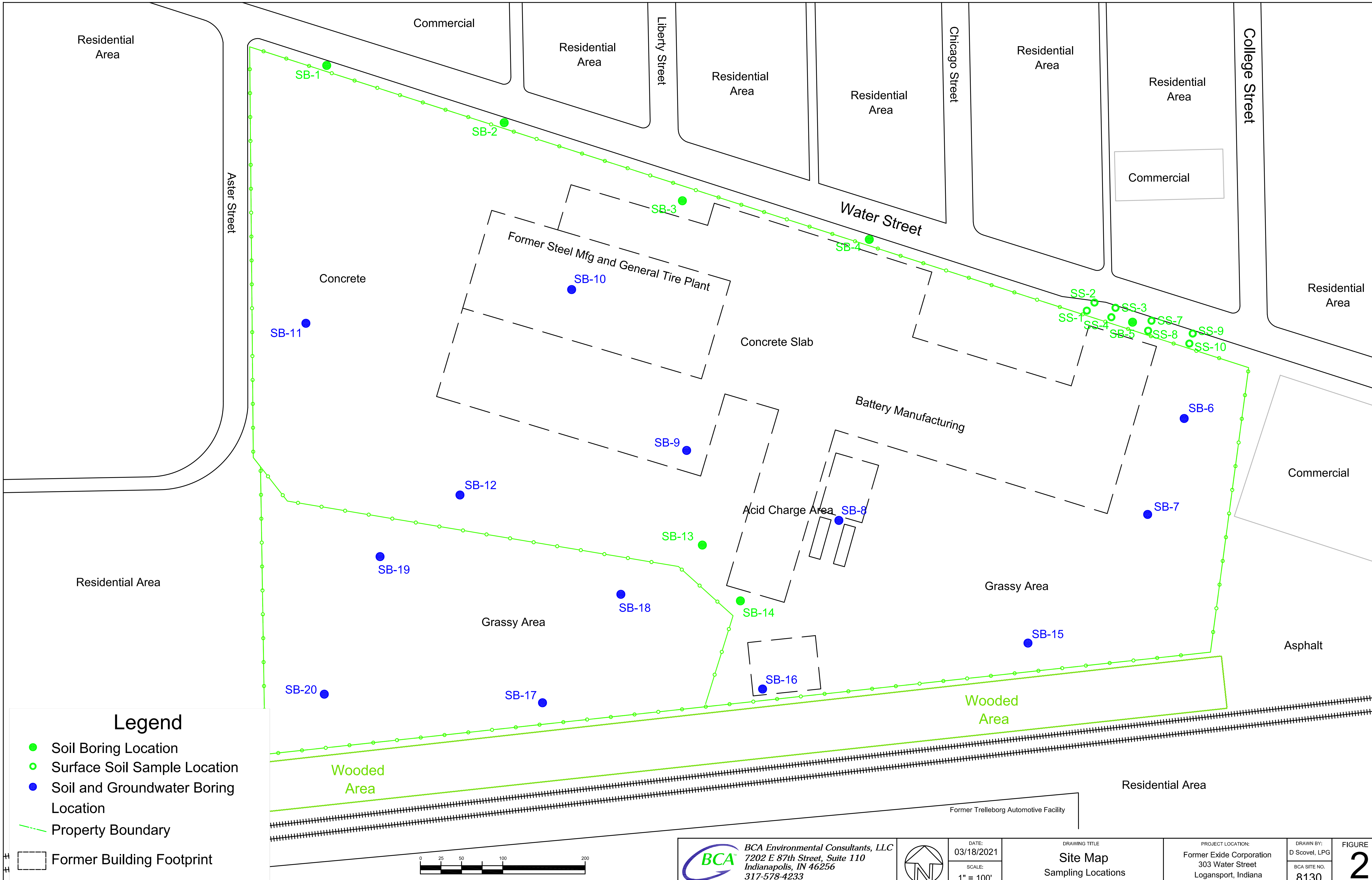
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
INDIANAPOLIS, IN 46256
317-578-4233

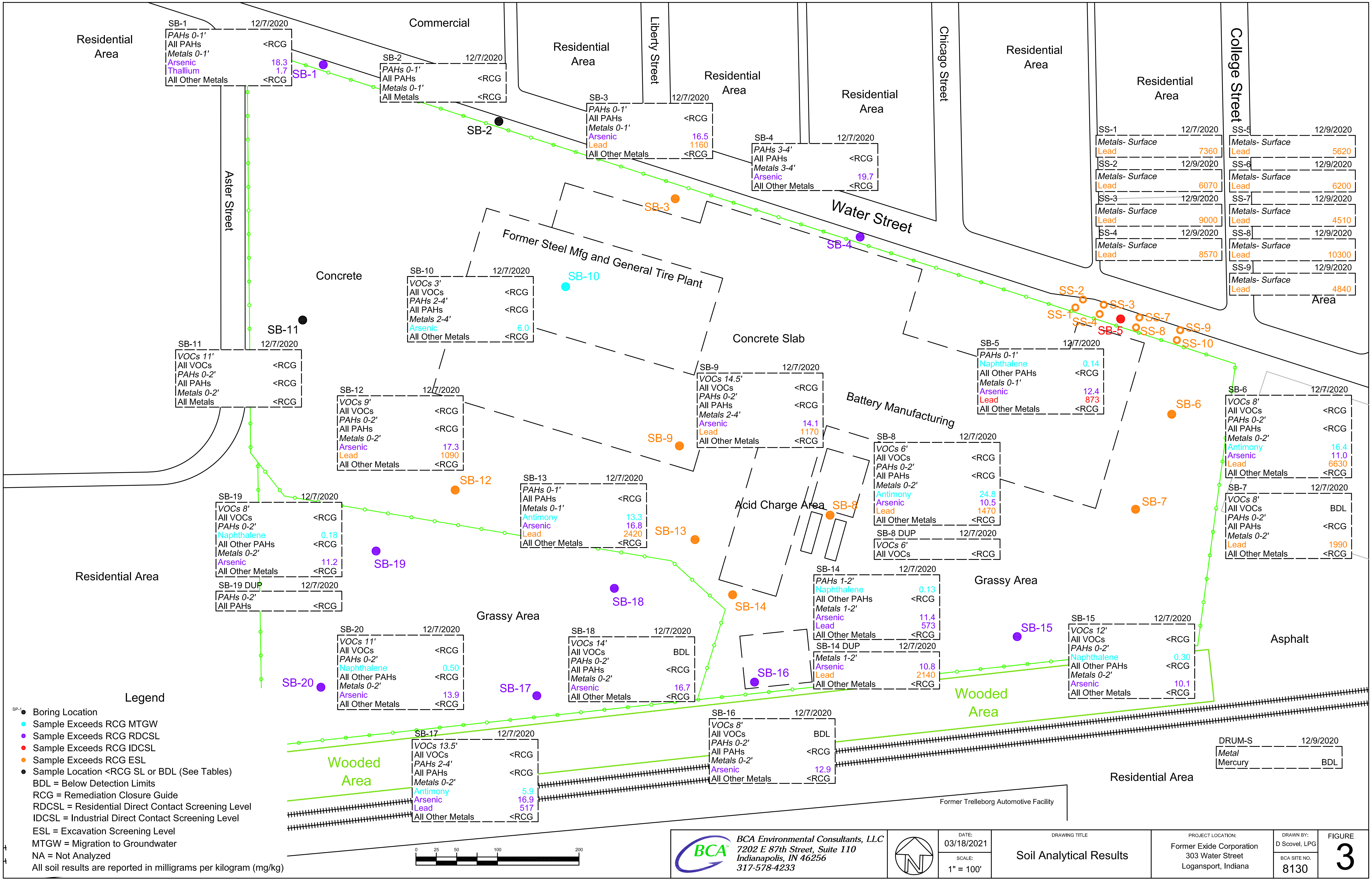
APPROXIMATE SCALE:	NTS
DRAWN BY:	JA
DATE:	9/21/2020
BCA PROJECT NO.	20-223

DRAWING TITLE
USGS TOPOGRAPHIC MAP

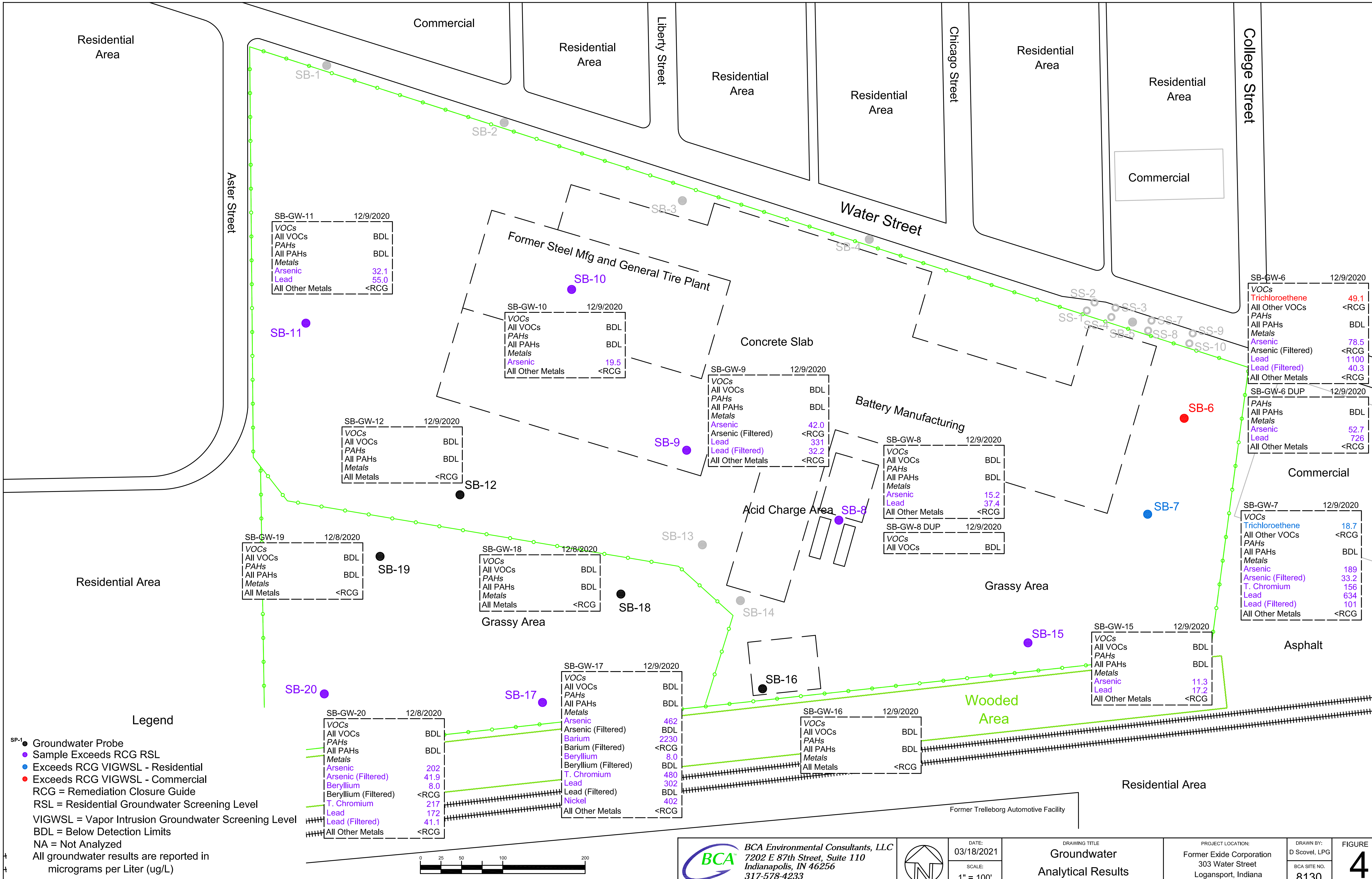
PROJECT LOCATION:
Exide Corporation
303 Water Street
Logansport, Indiana

FIGURE
1


Residential Area
Commercial
Residential Area
Liberty Street
Residential Area
Residential Area
Chicago Street
Residential Area
Residential Area
College Street
Commercial
Water Street
Aster Street
Residential Area
Commercial
Asphalt
Residential Area
Residential Area
Former Trelleborg Automotive Facility
SB-1
SB-2
SB-3
SB-4
SS-1
SS-2
SS-3
SS-4
SB-5
SS-7
SS-8
SS-9
SS-10
SB-6
SB-7
SB-8
SB-9
SB-10
SB-11
SB-12
SB-13
SB-14
SB-15
SB-16
SB-17
SB-18
SB-19
SB-20
Concrete
Former Steel Mfg and General Tire Plant
Concrete Slab
Battery Manufacturing
Acid Charge Area
Grassy Area
Grassy Area
Wooded Area
Wooded Area
Legend
Soil Boring Location
Surface Soil Sample Location
Soil and Groundwater Boring Location
Property Boundary
Former Building Footprint
0
25
50
100
200
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
DATE:
03/18/2021
SCALE:
1" = 100'
DRAWING TITLE
Site Map
Sampling Locations
PROJECT LOCATION:
Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY:
D Scovel, LPG
BCA SITE NO.
8130
FIGURE
2



Residential Area
Commercial
Residential Area
Liberty Street
Residential Area
Residential Area
Chicago Street
Residential Area
Residential Area
College Street
SB-1 12/7/2020
PAHs 0-1'
All PAHs <RCG
Metals 0-1'
Arsenic 18.3
Thallium 1.7
All Other Metals <RCG
SB-1
SB-2 12/7/2020
PAHs 0-1'
All PAHs <RCG
Metals 0-1'
All Metals <RCG
SB-2
SB-3 12/7/2020
PAHs 0-1'
All PAHs <RCG
Metals 0-1'
Arsenic 16.5
Lead 1160
All Other Metals <RCG
SB-4 12/7/2020
PAHs 3-4'
All PAHs <RCG
Metals 3-4'
Arsenic 19.7
All Other Metals <RCG
SS-1 12/7/2020
Metals- Surface
Lead 7360
SS-2 12/9/2020
Metals- Surface
Lead 6070
SS-3 12/9/2020
Metals- Surface
Lead 9000
SS-4 12/9/2020
Metals- Surface
Lead 8570
SS-5 12/9/2020
Metals- Surface
Lead 5620
SS-6 12/9/2020
Metals- Surface
Lead 6200
SS-7 12/9/2020
Metals- Surface
Lead 4510
SS-8 12/9/2020
Metals- Surface
Lead 10300
SS-9 12/9/2020
Metals- Surface
Lead 4840
Area
Aster Street
SB-3
Water Street
SB-4
Former Steel Mfg and General Tire Plant
Concrete
SB-10 12/7/2020
VOCs 3'
All VOCs <RCG
PAHs 2-4'
All PAHs <RCG
Metals 2-4'
Arsenic 6.0
All Other Metals <RCG
SB-10
SB-11
SS-2
SS-3
SS-1
SS-4
SS-7
SB-5
SS-8
SS-9
SS-10
Concrete Slab
SB-11 12/7/2020
VOCs 11'
All VOCs <RCG
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
All Metals <RCG
SB-5 12/7/2020
PAHs 0-1'
Naphthalene 0.14
All Other PAHs <RCG
Metals 0-1'
Arsenic 12.4
Lead 873
All Other Metals <RCG
SB-9 12/7/2020
VOCs 14.5'
All VOCs <RCG
PAHs 0-2'
All PAHs <RCG
Metals 2-4'
Arsenic 14.1
Lead 1170
All Other Metals <RCG
SB-12 12/7/2020
VOCs 9'
All VOCs <RCG
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
Arsenic 17.3
Lead 1090
All Other Metals <RCG
Battery Manufacturing
SB-6
SB-6 12/7/2020
VOCs 8'
All VOCs <RCG
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
Antimony 16.4
Arsenic 11.0
Lead 6630
All Other Metals <RCG
SB-9
SB-8 12/7/2020
VOCs 6'
All VOCs <RCG
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
Antimony 24.8
Arsenic 10.5
Lead 1470
All Other Metals <RCG
SB-12
SB-13 12/7/2020
PAHs 0-1'
All PAHs <RCG
Metals 0-1'
Antimony 13.3
Arsenic 16.8
Lead 2420
All Other Metals <RCG
SB-19 12/7/2020
VOCs 8'
All VOCs <RCG
PAHs 0-2'
Naphthalene 0.18
All Other PAHs <RCG
Metals 0-2'
Arsenic 11.2
All Other Metals <RCG
Acid Charge Area
SB-8
SB-7
SB-7 12/7/2020
VOCs 8'
All VOCs BDL
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
Lead 1990
All Other Metals <RCG
SB-13
SB-8 DUP 12/7/2020
VOCs 6'
All VOCs <RCG
SB-19
Residential Area
SB-19 DUP 12/7/2020
PAHs 0-2'
All PAHs <RCG
SB-18
SB-14 12/7/2020
PAHs 1-2'
Naphthalene 0.13
All Other PAHs <RCG
Metals 1-2'
Arsenic 11.4
Lead 573
All Other Metals <RCG
Grassy Area
SB-14
Grassy Area
SB-15
SB-15 12/7/2020
VOCs 12'
All VOCs <RCG
PAHs 0-2'
Naphthalene 0.30
All Other PAHs <RCG
Metals 0-2'
Arsenic 10.1
All Other Metals <RCG
Asphalt
SB-20 12/7/2020
VOCs 11'
All VOCs <RCG
PAHs 0-2'
Naphthalene 0.50
All Other PAHs <RCG
Metals 0-2'
Arsenic 13.9
All Other Metals <RCG
SB-18 12/7/2020
VOCs 14'
All VOCs BDL
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
Arsenic 16.7
All Other Metals <RCG
SB-14 DUP 12/7/2020
Metals 1-2'
Arsenic 10.8
Lead 2140
All Other Metals <RCG
SB-16
SB-20
SB-17
Wooded Area
Legend
Boring Location
Sample Exceeds RCG MTGW
Sample Exceeds RCG RDCSL
Sample Exceeds RCG IDCSL
Sample Exceeds RCG ESL
Sample Location <RCG SL or BDL (See Tables)
BDL = Below Detection Limits
RCG = Remediation Closure Guide
RDCSL = Residential Direct Contact Screening Level
IDCSL = Industrial Direct Contact Screening Level
ESL = Excavation Screening Level
MTGW = Migration to Groundwater
NA = Not Analyzed
All soil results are reported in milligrams per kilogram (mg/kg)
SB-16 12/7/2020
VOCs 8'
All VOCs BDL
PAHs 0-2'
All PAHs <RCG
Metals 0-2'
Arsenic 12.9
All Other Metals <RCG
SB-17 12/7/2020
VOCs 13.5'
All VOCs <RCG
PAHs 2-4'
All PAHs <RCG
Metals 0-2'
Antimony 5.9
Arsenic 16.9
Lead 517
All Other Metals <RCG
Wooded Area
DRUM-S 12/9/2020
Metal
Mercury BDL
Residential Area
Former Trelleborg Automotive Facility
0 25 50 100 200
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
N
DATE: 03/18/2021
SCALE: 1" = 100'
DRAWING TITLE
Soil Analytical Results
PROJECT LOCATION:
Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY: D Scovel, LPG
BCA SITE NO. 8130
FIGURE 3


Residential Area
Commercial
Residential Area
Liberty Street
Residential Area
Residential Area
Chicago Street
Residential Area
Residential Area
College Street
Commercial
Water Street
Aster Street
SB-1
SB-2
SB-3
SB-4
Former Steel Mfg and General Tire Plant
SB-10
SB-11
Concrete Slab
Battery Manufacturing
SS-1
SS-2
SS-3
SS-4
SS-5
SS-7
SS-8
SS-9
SS-10
SB-6
SB-7
Commercial
SB-9
SB-12
SB-8
Acid Charge Area
SB-13
SB-19
SB-18
SB-14
Grassy Area
Grassy Area
Residential Area
SB-15
Asphalt
SB-16
Wooded Area
SB-20
SB-17
Residential Area
Former Trelleborg Automotive Facility
SB-GW-11 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 32.1
Lead 55.0
All Other Metals <RCG
SB-GW-10 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 19.5
All Other Metals <RCG
SB-GW-9 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 42.0
Arsenic (Filtered) <RCG
Lead 331
Lead (Filtered) 32.2
All Other Metals <RCG
SB-GW-12 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
All Metals <RCG
SB-GW-8 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 15.2
Lead 37.4
All Other Metals <RCG
SB-GW-8 DUP 12/9/2020
VOCs
All VOCs BDL
SB-GW-6 12/9/2020
VOCs
Trichloroethene 49.1
All Other VOCs <RCG
PAHs
All PAHs BDL
Metals
Arsenic 78.5
Arsenic (Filtered) <RCG
Lead 1100
Lead (Filtered) 40.3
All Other Metals <RCG
SB-GW-6 DUP 12/9/2020
PAHs
All PAHs BDL
Metals
Arsenic 52.7
Lead 726
All Other Metals <RCG
SB-GW-7 12/9/2020
VOCs
Trichloroethene 18.7
All Other VOCs <RCG
PAHs
All PAHs BDL
Metals
Arsenic 189
Arsenic (Filtered) 33.2
T. Chromium 156
Lead 634
Lead (Filtered) 101
All Other Metals <RCG
SB-GW-19 12/8/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
All Metals <RCG
SB-GW-18 12/8/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
All Metals <RCG
SB-GW-15 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 11.3
Lead 17.2
All Other Metals <RCG
SB-GW-17 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 462
Arsenic (Filtered) BDL
Barium 2230
Barium (Filtered) <RCG
Beryllium 8.0
Beryllium (Filtered) BDL
T. Chromium 480
Lead 302
Lead (Filtered) BDL
Nickel 402
All Other Metals <RCG
SB-GW-16 12/9/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
All Metals <RCG
SB-GW-20 12/8/2020
VOCs
All VOCs BDL
PAHs
All PAHs BDL
Metals
Arsenic 202
Arsenic (Filtered) 41.9
Beryllium 8.0
Beryllium (Filtered) <RCG
T. Chromium 217
Lead 172
Lead (Filtered) 41.1
All Other Metals <RCG
Legend
SP-1 Groundwater Probe
Sample Exceeds RCG RSL
Exceeds RCG VIGWSL - Residential
Exceeds RCG VIGWSL - Commercial
RCG = Remediation Closure Guide
RSL = Residential Groundwater Screening Level
VIGWSL = Vapor Intrusion Groundwater Screening Level
BDL = Below Detection Limits
NA = Not Analyzed
All groundwater results are reported in micrograms per Liter (ug/L)
0 25 50 100 200
BCA
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
N
DATE: 03/18/2021
SCALE: 1" = 100'
DRAWING TITLE
Groundwater Analytical Results
PROJECT LOCATION:
Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY: D Scovel, LPG
BCA SITE NO. 8130
FIGURE 4

Tables

Phase II Environmental Site Assessment
Former Exide Corporation
303 Water Street
Logansport, IN

Table 1
Soil Analytical Results - VOCs

Project ID	Sample ID	Collected Date	Units	Acetone	Benzene	2-Butanone (MEK)	Carbon disulfide	Carbon tetrachloride	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Iodomethane	p-Isopropyltoluene	Methylene Chloride	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	Xylene (Total)	Other VOCs
			CAS Number	67-64-1	71-43-2	78-93-3	75-15-0	56-23-5	67-66-3	156-59-2	100-41-4	74-88-4	99-87-6	75-09-2	90-12-0	91-57-6	91-20-3	127-18-4	108-88-3	79-01-6	95-63-6	108-67-8	75-01-4	1330-20-7	Varies
RCG Residential Direct Contact Screening Level [1]			**mg/kg**	**85000**	**17**	**28000**	**740**	**9.1**	**4.5**	**220**	**81**	**---**	**---**	**490**	**250**	**340**	**53**	**110**	**820**	**5.7**	**220**	**180**	**0.83**	**260**	**Varies**
RCG Commercial/Industrial Direct Contact Screening Level [1]			**mg/kg**	**100000**	**51**	**28000**	**740**	**29**	**14**	**2300**	**250**	**---**	**---**	**3200**	**390**	**3000**	**170**	**170**	**820**	**19**	**220**	**180**	**17**	**260**	**Varies**
RCG Excavation Screening Level*			**mg/kg**	**100000**	**1800**	**28000**	**740**	**460**	**1900**	**2400**	**480**	**---**	**---**	**3300**	**390**	**6800**	**3100**	**170**	**820**	**95**	**220**	**180**	**1300**	**260**	**Varies**
RCG Soil Migration to GW Screening Level*			**mg/kg**	**57**	**0.051**	**23**	**4.8**	**0.039**	**0.44**	**0.41**	**16**	**---**	**---**	**0.025**	**1.2**	**3.7**	**0.11**	**0.045**	**14**	**0.036**	**1.6**	**1.7**	**0.014**	**200**	**Varies**
Former Exide 20-224	SB-6 8'	12/07/2020 14:55	mg/kg	**0.021 J**	<0.00035	<0.0022	**0.0059 J**	<0.00033	<0.00035	<0.00037	<0.00033	<0.0026	<0.00024	<0.00090	<0.00024	<0.00021	<0.00030	<0.00020	<0.00035	<0.00031	<0.00025	<0.00024	<0.00025	<0.00058	BDL
Former Exide 20-224	SB-7 8'	12/07/2020 14:30	mg/kg	<0.0046	<0.00040	<0.0025	<0.00039	<0.00038	<0.00041	<0.00043	<0.00038	<0.0029	<0.00028	<0.0010	<0.00027	<0.00024	<0.00034	<0.00023	<0.00040	<0.00035	<0.00029	<0.00027	<0.00029	<0.00066	BDL
Former Exide 20-224	SB-8 6'	12/08/2020 09:15	mg/kg	<0.0051	<0.00044	<0.0028	<0.00043	<0.00042	<0.00045	<0.00048	<0.00042	<0.0033	<0.00031	**0.0017 J**	<0.00030	<0.00027	<0.00038	<0.00025	**0.00088 J**	<0.00039	<0.00032	<0.00030	<0.00032	<0.00074	BDL
Former Exide 20-224	SB-8 6' DUP	12/08/2020 09:15	mg/kg	<0.0045	<0.00039	<0.0025	<0.00038	<0.00038	<0.00040	<0.00043	<0.00037	<0.0029	<0.00027	**0.010 J**	<0.00027	<0.00024	<0.00034	<0.00023	<0.00040	<0.00035	<0.00029	<0.00027	<0.00029	<0.00066	BDL
Former Exide 20-224	SB-9 14.5'	12/07/2020 15:30	mg/kg	**0.0072 J**	<0.00033	<0.0021	<0.00032	<0.00031	<0.00033	<0.00035	<0.00031	<0.0024	<0.00023	**0.0016 J**	<0.00022	<0.00020	<0.00028	<0.00019	<0.00033	<0.00029	<0.00024	<0.00022	<0.00024	<0.00055	BDL
Former Exide 20-224	SB-10 3'	12/08/2020 09:35	mg/kg	**0.086 J**	<0.00053	<0.0033	<0.00051	<0.00050	<0.00054	<0.00057	<0.00050	**0.0069 J**	<0.00037	<0.0014	<0.00036	<0.00032	<0.00045	<0.00030	<0.00053	<0.00047	<0.00039	<0.00036	<0.00038	<0.00088	BDL
Former Exide 20-224	SB-11 11'	12/08/2020 10:45	mg/kg	**0.0060 J**	<0.00013	<0.0010	<0.00030	<0.00017	<0.00015	<0.00016	<0.00015	<0.00083	<0.00015	<0.0045	<0.00022	<0.00022	<0.00014	<0.00014	<0.00013	<0.00015	<0.00013	<0.00014	<0.00025	<0.00028	BDL
Former Exide 20-224	SB-12 9'	12/08/2020 10:10	mg/kg	<0.0046	<0.00040	<0.0025	<0.00039	<0.00038	<0.00041	<0.00043	<0.00038	**0.0052 J**	<0.00028	**0.016 J**	<0.00027	<0.00024	<0.00034	<0.00023	<0.00040	<0.00036	<0.00029	<0.00027	<0.00029	<0.00067	BDL
Former Exide 20-224	SB-15 12'	12/07/2020 14:20	mg/kg	**0.0068 J**	<0.00029	<0.0019	<0.00028	<0.00028	<0.00030	<0.00032	<0.00028	<0.0022	<0.00020	**0.0014 J**	<0.00020	<0.00018	<0.00025	<0.00017	<0.00029	<0.00026	<0.00021	<0.00020	<0.00021	<0.00049	BDL
Former Exide 20-224	SB-16 8'	12/07/2020 13:40	mg/kg	<0.0019	<0.00016	<0.0010	<0.00016	<0.00016	<0.00017	<0.00018	<0.00015	<0.0012	<0.00011	<0.00043	<0.00011	<0.00010	<0.00014	<0.000094	<0.00016	<0.00015	<0.00012	<0.00011	<0.00012	<0.00027	BDL
Former Exide 20-224	SB-17 13.5'	12/07/2020 11:50	mg/kg	**0.0075 J**	<0.00029	<0.0019	<0.00028	<0.00028	<0.00030	<0.00032	<0.00028	<0.0022	<0.00020	**0.0018 J**	<0.00020	<0.00018	<0.00025	<0.00017	<0.00030	<0.00026	<0.00022	<0.00020	<0.00021	<0.00049	BDL
Former Exide 20-224	SB-18 14'	12/07/2020 12:40	mg/kg	<0.0035	<0.00031	<0.0020	<0.00030	<0.00029	<0.00031	<0.00033	<0.00029	<0.0023	<0.00021	<0.00081	<0.00021	<0.00019	<0.00026	<0.00018	<0.00031	<0.00027	<0.00023	<0.00021	<0.00022	<0.00051	BDL
Former Exide 20-224	SB-19 8'	12/07/2020 11:40	mg/kg	**0.0099 J**	<0.00032	<0.0020	<0.00031	<0.00030	<0.00032	<0.00034	<0.00030	<0.0024	<0.00022	<0.00083	<0.00022	<0.00019	<0.00027	<0.00018	<0.00032	<0.00028	<0.00023	<0.00022	<0.00023	<0.00053	BDL
Former Exide 20-224	SB-20 11'	12/07/2020 11:25	mg/kg	**0.012 J**	<0.00032	<0.0020	<0.00031	<0.00031	<0.00033	<0.00035	<0.00030	<0.0024	<0.00022	**0.0025 J**	<0.00022	<0.00020	<0.00028	<0.00019	<0.00032	<0.00029	<0.00024	<0.00022	<0.00023	<0.00054	BDL
Former Exide 20-224	TB	12/08/2020 08:00	mg/kg	**0.0066 J**	<0.00040	<0.0025	<0.00039	<0.00038	<0.00041	<0.00043	<0.00038	<0.0030	<0.00028	**0.0032 J**	<0.00027	<0.00024	<0.00034	<0.00023	**0.0014 J**	<0.00036	<0.00029	<0.00027	<0.00029	<0.00067	BDL
Field Duplicate RPD (SP-3 6' & Dup)[2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**141.9%**	0.0%	0.0%	0.0%	0.0%	**125.9%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Samples analyzed using EPA SW-846 Method 8260

mg/kg = milligrams per kilogram

VOCs = Volatile Organic Compounds

BDL - Below Detection Limits

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 2
Soil Analytical Results - PAHs

Project ID	Sample ID	Collected Date	Units	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
	CAS Number			83-32-9	208-96-8	120-12-7	56-55-3	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	53-70-3	206-44-0	86-73-7	193-39-5	90-12-0	91-57-6	91-20-3	85-01-8	129-00-0
RCG Residential Direct Contact Screening Level [1]			mg/kg	**5000**	**---**	**25000**	**16**	**1.6**	**16**	**---**	**160**	**1600**	**1.6**	**3400**	**3400**	**16**	**250**	**340**	**53**	**---**	**2500**
RCG Commercial/Industrial Direct Contact Screening Level [1]			mg/kg	**45000**	**---**	**100000**	**210**	**21**	**210**	**---**	**2100**	**21000**	**21**	**30000**	**30000**	**21**	**390**	**3000**	**170**	**---**	**23000**
RCG Excavation Screening Level [1]			mg/kg	**100000**	**---**	**100000**	**12000**	**500**	**12000**	**---**	**10000**	**100000**	**1200**	**68000**	**68000**	**12000**	**390**	**6800**	**3100**	**---**	**51000**
RCG Soil Migration to GW Screening Level [1]			mg/kg	**110**	**---**	**1200**	**2.1**	**4.7**	**60**	**---**	**590**	**1800**	**19**	**1800**	**110**	**200**	**1.2**	**3.7**	**0.11**	**---**	**260**
Former Exide 20-224	SB-1 0-1'	12/07/2020 09:20	mg/kg	<0.0072	**0.027**	**0.025**	**0.13**	**0.14**	**0.21**	**0.12**	**0.093**	**0.19**	**0.059**	**0.20**	<0.0071	**0.096**	**0.086**	**0.070**	**0.040**	**0.29**	**0.18**
Former Exide 20-224	SB-2 0-1'	12/07/2020 09:40	mg/kg	<0.0064	**0.039**	**0.023**	**0.073**	**0.096**	**0.13**	**0.099**	**0.058**	**0.095**	**0.026**	**0.080**	<0.0063	**0.064**	**0.074**	**0.061**	**0.024**	**0.14**	**0.084**
Former Exide 20-224	SB-3 0-1'	12/07/2020 10:20	mg/kg	**0.013 J**	**0.040**	**0.065**	**0.32**	**0.29**	**0.43**	**0.24**	**0.12**	**0.43**	**0.063**	**0.56**	**0.015 J**	**0.17**	**0.10**	**0.11**	**0.065**	**0.89**	**0.63**
Former Exide 20-224	SB-4 3-4'	12/07/2020 09:50	mg/kg	<0.0025	**0.0074**	**0.012**	**0.035**	**0.033**	**0.058**	**0.033**	**0.018**	**0.047**	**0.0092**	**0.071**	<0.0024	**0.026**	**0.016**	**0.015**	**0.019**	**0.098**	**0.067**
Former Exide 20-224	SB-5 0-1'	12/07/2020 10:05	mg/kg	**0.012 J**	**0.22**	**0.19**	**0.44**	**0.51**	**0.86**	**0.59**	**0.40**	**0.64**	**0.13**	**0.69**	**0.028**	**0.37**	**0.24**	**0.25**	**0.14**	**0.88**	**0.71**
Former Exide 20-224	SB-6 0-2'	12/07/2020 14:50	mg/kg	<0.0062	**0.065**	**0.048**	**0.14**	**0.15**	**0.22**	**0.17**	**0.099**	**0.18**	**0.043**	**0.24**	<0.0061	**0.11**	**0.097**	**0.10**	**0.058**	**0.36**	**0.22**
Former Exide 20-224	SB-7 0-2'	12/07/2020 14:25	mg/kg	<0.0056	**0.018**	**0.021**	**0.066**	**0.065**	**0.11**	**0.063**	**0.030**	**0.093**	**0.018**	**0.13**	<0.0055	**0.043**	**0.045**	**0.045**	**0.027**	**0.22**	**0.11**
Former Exide 20-224	SB-8 0-2'	12/08/2020 09:10	mg/kg	<0.0057	<0.0053	**0.0096 J**	**0.033**	**0.028**	**0.047**	**0.027**	**0.014 J**	**0.041**	<0.0070	**0.060**	<0.0056	**0.019**	**0.013 J**	**0.013 J**	<0.0053	**0.064**	**0.054**
Former Exide 20-224	SB-9 0-2'	12/07/2020 15:20	mg/kg	<0.0020	<0.0019	<0.0025	**0.0035 J**	<0.0030	**0.0044 J**	**0.0035 J**	<0.0023	**0.0047 J**	<0.0025	**0.0051**	<0.0020	<0.0026	<0.0020	<0.0019	<0.0019	**0.0048 J**	**0.0060**
Former Exide 20-224	SB-10 2-4'	12/08/2020 09:35	mg/kg	**0.031**	**0.018 J**	**0.072**	**0.12**	**0.077**	**0.13**	**0.090**	**0.054**	**0.17**	**0.022**	**0.26**	**0.028**	**0.056**	**0.092**	**0.092**	**0.089**	**0.76**	**0.21**
Former Exide 20-224	SB-11 0-2'	12/08/2020 10:35	mg/kg	**0.018**	**0.047**	**0.097**	**0.26**	**0.25**	**0.28**	**0.18**	**0.13**	**0.28**	**0.050**	**0.51**	**0.030**	**0.13**	**0.043**	**0.032**	**0.030**	**0.55**	**0.56**
Former Exide 20-224	SB-12 0-2'	12/08/2020 10:05	mg/kg	**0.020**	**0.11**	**0.16**	**0.59**	**0.56**	**0.67**	**0.46**	**0.32**	**0.66**	**0.12**	**0.98**	**0.034**	**0.32**	**0.10**	**0.12**	**0.083**	**0.91**	**1.1**
Former Exide 20-224	SB-13 0-1'	12/08/2020 10:55	mg/kg	**0.013**	**0.042**	**0.064**	**0.24**	**0.27**	**0.36**	**0.24**	**0.15**	**0.34**	**0.066**	**0.45**	**0.012**	**0.16**	**0.092**	**0.11**	**0.072**	**0.48**	**0.46**
Former Exide 20-224	SB-14 1-2'	12/08/2020 10:40	mg/kg	<0.0059	**0.042**	**0.072**	**0.18**	**0.14**	**0.21**	**0.11**	**0.090**	**0.23**	**0.023**	**0.48**	**0.010 J**	**0.077**	**0.21**	**0.22**	**0.13**	**1.3**	**0.35**
Former Exide 20-224	SB-15 0-2'	12/07/2020 14:10	mg/kg	**0.064 J**	**0.096**	**0.18**	**0.47**	**0.36**	**0.46**	**0.27**	**0.18**	**0.64**	**0.055 J**	**1.0**	**0.077 J**	**0.16**	**0.51**	**0.51**	**0.30**	**3.4**	**0.80**
Former Exide 20-224	SB-16 0-2'	12/07/2020 13:20	mg/kg	<0.0021	<0.0020	<0.0027	**0.0072**	**0.0081**	**0.013**	**0.0084**	**0.0063**	**0.011**	<0.0026	**0.015**	<0.0021	**0.0062**	**0.0036 J**	**0.0043 J**	**0.0037 J**	**0.016**	**0.012**
Former Exide 20-224	SB-17 2-4'	12/07/2020 11:50	mg/kg	<0.0022	<0.0020	<0.0027	<0.0032	<0.0032	<0.0030	<0.0032	<0.0025	**0.0041 J**	<0.0026	<0.0037	<0.0021	<0.0027	<0.0022	<0.0021	<0.0020	**0.0043 J**	<0.0037
Former Exide 20-224	SB-18 0-2'	12/07/2020 12:30	mg/kg	<0.0068	**0.026**	**0.030**	**0.13**	**0.13**	**0.19**	**0.088**	**0.057**	**0.15**	**0.017**	**0.20**	<0.0067	**0.068**	**0.061**	**0.057**	**0.028**	**0.37**	**0.20**
Former Exide 20-224	SB-19 0-2'	12/07/2020 11:35	mg/kg	<0.0072	**0.047**	**0.029**	**0.057**	**0.040**	**0.072**	**0.038**	**0.016 J**	**0.086**	<0.0088	**0.15**	**0.016 J**	**0.022**	**0.15**	**0.12**	**0.18**	**0.58**	**0.12**
Former Exide 20-224	SB-19 0-2' DUP	12/07/2020 11:35	mg/kg	<0.0066	**0.020**	**0.035**	**0.086**	**0.076**	**0.090**	**0.047**	**0.031**	**0.081**	<0.0081	**0.20**	**0.013 J**	**0.038**	<0.0066	<0.0063	<0.0061	**0.18**	**0.18**
Former Exide 20-224	SB-20 0-2'	12/07/2020 11:15	mg/kg	<0.068	<0.064	**0.12 J**	**0.40**	**0.31**	**0.48**	**0.25**	**0.19**	**0.51**	<0.084	**0.76**	<0.067	**0.18**	**0.90**	**0.88**	**0.50**	**2.7**	**0.64**
Field Duplicate RPD (SP-3 4-6' & Dup)[2]			%	0.0%	**80.6%**	**18.8%**	**40.6%**	**62.1%**	**22.2%**	**21.2%**	**63.8%**	**6.0%**	0.0%	**28.6%**	**20.7%**	**53.3%**	**191.4%**	**189.8%**	**193.3%**	**105.3%**	**40.0%**

Notes:

Samples analyzed using EPA SW-846 Method 8270 SIM

mg/kg = milligrams per kilogram

ppm - parts per million

PAHs - Polynuclear Aromatic Hydrocarbons

SVOCs = Semi-volatile organic compounds

BDL - Below Detection Limits

<SL - Below RCG Screening Levels

Blank cells = Not Analyzed

--- No value given in the Remediation Closure Guide

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 3
Soil Analytical Results - Metals

Project ID	Sample ID	Collected Date	Units	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium Total	Chromium VI 7199	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium - 6020	Zinc
	CAS Number			7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-47-3	18540-29-9	7440-50-8	7439-92-1	7439-97-6	7440-02-0	7782-49-2	7440-22-4	7440-28-0	7440-66-6
RCG Residential Direct Contact Screening Level [1]			**mg/kg**	**43**	**9.5**	**21000**	**220**	**99**	**---**	**4.2**	**4300**	**400**	**3.1**	**2100**	**550**	**550**	**1.1**	**32000**
RCG Commercial/Industrial Direct Contact Screening Level [1]			**mg/kg**	**470**	**30**	**100000**	**2300**	**980**	**---**	**63**	**47000**	**800**	**3.1**	**22000**	**5800**	**5800**	**12**	**100000**
RCG Excavation Screening Level [1]			**mg/kg**	**790**	**920**	**100000**	**3800**	**1900**	**---**	**2700**	**79000**	**1000**	**3.1**	**38000**	**9800**	**9800**	**20**	**100000**
RCG Soil Migration to GW Screening Level [1]			**mg/kg**	**5.4**	**5.9**	**1700**	**63**	**7.5**	**1000000**	**0.14**	**920**	**270**	**2.1**	**510**	**5.3**	**16**	**2.9**	**7500**
Former Exide 20-224	SB-1 0-1'	12/07/2020 09:20	mg/kg	<0.27	**18.3**	**133**	**2.5**	**2.1**	**14.6**		**29.2**	**85.4**	**0.12 J**	**23.1**	<0.35	<0.31	**1.7**	**216**
Former Exide 20-224	SB-2 0-1'	12/07/2020 09:40	mg/kg	<0.21	**5.2**	**35.2**	<0.014	**0.45 J**	**7.6**		**17.5**	**70.4**	<0.087	**8.1**	<0.27	<0.24	<0.22	**60.7**
Former Exide 20-224	SB-3 0-1'	12/07/2020 10:20	mg/kg	**2.8**	**16.5**	**113**	**0.99**	**0.78**	**14.9**		**60.0**	**1160**	**0.22**	**17.2**	<0.30	<0.26	<0.24	**149**
Former Exide 20-224	SB-4 3-4'	12/07/2020 09:50	mg/kg	<0.26	**19.7**	**151**	**0.96**	**0.59 J**	**14.7**		**32.5**	**125**	**0.23 J**	**19.3**	<0.34	<0.30	**0.33 J**	**110**
Former Exide 20-224	SB-5 0-1'	12/07/2020 10:05	mg/kg	**3.0**	**12.4**	**54.1**	**0.41 J**	**0.42 J**	**9.4**		**34.4**	**873**	<0.087	**15.7**	<0.29	<0.25	**0.25 J**	**87.8**
Former Exide 20-224	SB-6 0-2'	12/07/2020 14:50	mg/kg	**16.4**	**11.0**	**192**	**0.11 J**	**0.98**	**6.6**		**22.5**	**6630**	<0.088	**8.4**	**0.61 J**	<0.23	<0.21	**108**
Former Exide 20-224	SB-7 0-2'	12/07/2020 14:25	mg/kg	**3.4**	**5.0**	**123**	<0.014	**0.30 J**	**4.4**		**8.9**	**1990**	<0.081	**5.1**	**0.42 J**	<0.24	<0.45	**52.3**
Former Exide 20-224	SB-8 0-2'	12/08/2020 09:10	mg/kg	**24.8**	**10.5**	**35.8**	**0.12 J**	**1.1**	**29.8**		**85.0**	**1470**	<0.054	**20.4**	**0.38 J**	**0.36 J**	<0.21	**131**
Former Exide 20-224	SB-9 2-4'	12/07/2020 15:20	mg/kg	<0.21	**14.1**	**144**	**0.29 J**	**3.3**	**8.6**		**286**	**1170**	**1.5**	**11.3**	<0.27	<0.24	<0.22	**6710**
Former Exide 20-224	SB-10 2-4'	12/08/2020 09:35	mg/kg	**0.41 J**	**6.0**	**123**	**1.0**	**0.48 J**	**12.1**		**30.5**	**57.3**	<0.11	**15.2**	**0.46 J**	<0.30	**0.52 J**	**123**
Former Exide 20-224	SB-11 0-2'	12/08/2020 10:35	mg/kg	**0.28 J**	**5.9**	**130**	**0.40 J**	**0.43 J**	**8.8**		**16.4**	**95.6**	<0.098	**9.5**	<0.30	<0.26	<0.24	**67.6**
Former Exide 20-224	SB-12 0-2'	12/08/2020 10:05	mg/kg	**4.1**	**17.3**	**76.7**	**0.80**	**1.6**	**13.7**		**120**	**1090**	**0.20 J**	**17.2**	**0.32 J**	<0.25	<0.23	**310**
Former Exide 20-224	SB-13 0-1'	12/08/2020 10:55	mg/kg	**13.3**	**16.8**	**50.5**	**0.62 J**	**1.0**	**20.7**		**89.6**	**2420**	**0.21 J**	**20.9**	**2.1**	**1.2**	<0.32	**286**
Former Exide 20-224	SB-14 1-2'	12/08/2020 10:40	mg/kg	**2.9**	**11.4**	**53.8**	**0.58**	**0.63**	**12.5**		**56.7**	**573**	**0.19 J**	**20.6**	<0.28	<0.25	**0.24 J**	**139**
Former Exide 20-224	SB-14 1-2' DUP	12/08/2020 10:40	mg/kg	**3.5**	**10.8**	**43.6**	**0.61**	**0.50 J**	**11.4**		**98.7**	**2140**	<0.085	**18.5**	<0.29	<0.25	**0.37 J**	**127**
Former Exide 20-224	SB-15 0-2'	12/07/2020 14:10	mg/kg	**3.2**	**10.1**	**50.7**	**0.76**	**0.55**	**8.7**		**59.0**	**140**	**0.11 J**	**12.7**	<0.30	<0.26	**0.39 J**	**128**
Former Exide 20-224	SB-16 0-2'	12/07/2020 13:20	mg/kg	<0.19	**12.9**	**11.8**	<0.013	**0.18 J**	**6.8**		**9.6**	**28.7**	<0.079	**7.6**	<0.25	<0.22	<0.20	**53.8**
Former Exide 20-224	SB-17 0-2'	12/07/2020 11:50	mg/kg	**5.9**	**16.9**	**68.8**	**1.3**	**1.7**	**14.7**		**62.0**	**517**	<0.13	**20.7**	**1.0 J**	<0.36	**0.67 J**	**390**
Former Exide 20-224	SB-18 0-2'	12/07/2020 12:30	mg/kg	**0.30 J**	**16.7**	**219**	**0.36 J**	**0.75**	**11.0**		**26.0**	**91.4**	<0.085	**23.9**	<0.27	<0.24	<0.43	**110**
Former Exide 20-224	SB-19 0-2'	12/07/2020 11:35	mg/kg	**1.5**	**11.2**	**69.5**	**2.3**	**0.50 J**	**12.9**		**63.9**	**162**	<0.095	**18.2**	**0.72 J**	<0.26	**1.1**	**112**
Former Exide 20-224	SB-20 0-2'	12/07/2020 11:15	mg/kg	**1.7**	**13.9**	**48.4**	**1.3**	**1.2**	**11.3**		**93.8**	**162**	**0.10 J**	**18.4**	<0.29	<0.25	**0.73 J**	**680**
Former Exide 20-224	SS-1	12/07/2020 10:00	mg/kg									**7360**						
Former Exide 20-224	SS-2	12/09/2020 10:30	mg/kg									**6070**						
Former Exide 20-224	SS-3	12/09/2020 10:32	mg/kg									**9000**						
Former Exide 20-224	SS-4	12/09/2020 10:34	mg/kg									**8570**						
Former Exide 20-224	SS-5	12/09/2020 10:36	mg/kg									**5620**						
Former Exide 20-224	SS-6	12/09/2020 10:40	mg/kg									**6200**						
Former Exide 20-224	SS-7	12/09/2020 10:42	mg/kg									**4510**						
Former Exide 20-224	SS-8	12/09/2020 10:44	mg/kg									**10300**						
Former Exide 20-224	SS-9	12/09/2020 10:46	mg/kg									**4840**						
Field Duplicate RPD (SP-3 4-6' & Dup)[2]			%	**18.8%**	**5.4%**	**20.9%**	**5.0%**	**23.0%**	**9.2%**	**#DIV/0!**	**54.1%**	**115.5%**	**126.9%**	**10.7%**	0.0%	0.0%	**42.6%**	**9.0%**

Notes:

Samples alyzed using EPA Method 6010, 6020, 7471 (Metals)

mg/kg = milligrams per kilogram

ppm - parts per million

Blank cells = Not Analyzed

--- No value given in the Remediation Closure Guide

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 4
Soil Analytical Results - Herbicides

Project ID	Sample ID	Collected Date	Units	3,5-Dichlorobenzoic acid	Acifluorfen	Bentazon	2,4-D	Dalapon	2,4-DB	DCPA (dacthal)	Dicamba	Dichloroprop	Dinoseb	MCPA	MCPP	Pentachlorophenol	Picloram	2,4,5-T	2,4,5-TP (Silvex)
	CAS Number			51-36-5	50594-66-6	25057-89-0	94-75-7	75-99-0	94-82-6	2136-79-0	1918-00-9	15165-67-0	88-85-7	94-74-6	93-65-2	87-86-5	1918-02-1	93-76-5	93-72-1
RCG Residential Direct Contact Screening Level [1]			mg/kg	**---**	**---**	**2700**	**980**	**2700**	**2700**	**---**	**2700**	**---**	**88**	**45**	**88**	**14**	**6200**	**880**	**710**
RCG Commercial/Industrial Direct Contact Screening Level [1]			mg/kg	**---**	**---**	**25000**	**9600**	**25000**	**25000**	**---**	**25000**	**---**	**820**	**410**	**820**	**40**	**57000**	**8200**	**6600**
RCG Excavation Screening Level [1]			mg/kg	**---**	**---**	**52000**	**19000**	**52000**	**52000**	**---**	**52000**	**---**	**1800**	**870**	**1800**	**2600**	**100000**	**18000**	**14000**
RCG Soil Migration to GW Screening Level [1]			mg/kg	**---**	**---**	**2.5**	**0.36**	**0.83**	**8.5**	**---**	**2.9**	**---**	**1.2**	**0.039**	**0.095**	**0.028**	**2.8**	**1.3**	**0.55**
Former Exide 20-224	SB-15 0-2'	12/07/2020 14:10	mg/kg	<0.036	<0.039	<0.051	<0.037	<0.041	<0.047	<0.046	<0.044	<0.035	<0.030	<4.0	<4.1	<0.040	<0.041	<0.039	<0.041
Former Exide 20-224	SB-16 0-2'	12/07/2020 13:20	mg/kg	<0.034	<0.036	<0.047	<0.034	<0.038	<0.044	<0.043	<0.041	<0.033	<0.028	<3.7	<3.9	<0.037	<0.038	<0.036	<0.038
Former Exide 20-224	SB-16 0-2' DUP	12/07/2020 13:20	mg/kg	<0.035	<0.037	<0.048	<0.035	<0.039	<0.045	<0.044	<0.042	<0.033	<0.028	<3.8	<3.9	<0.038	<0.039	<0.037	<0.039
Former Exide 20-224	SB-17 2-4'	12/07/2020 11:50	mg/kg	<0.037	<0.040	<0.052	<0.038	<0.042	<0.048	<0.047	<0.045	<0.036	<0.031	<4.0	<4.2	<0.041	<0.042	<0.039	<0.042
Former Exide 20-224	SB-20 0-2'	12/07/2020 11:15	mg/kg	<0.037	<0.040	<0.052	<0.038	<0.042	<0.048	<0.047	<0.045	<0.036	<0.031	<4.0	<4.2	<0.041	<0.041	<0.039	<0.042
Field Duplicate RPD (SP-16 0-2' & Dup)[2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Samples analyzed using EPA Method 8151A

mg/kg = milligrams per kilogram

ppm - parts per million

BDL - Below Detection Limits

<SL - Below RCG Screening Levels

Blank cells = Not Analyzed

--- No value given in the Remediation Closure Guide

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 5
Groundwater Analytical Results - VOCs

Project ID	Sample ID	Collected Date	Units	Acetone	Benzene	Carbon tetrachloride	Chloroform	1,2-Dibromoethane (EDB)+	1,1-Dichloroethane	1,2-Dichloroethane+	cis-1,2-Dichloroethene	Ethylbenzene	Methylene Chloride	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	Xylene (Total)	Other VOCs
			CAS Number	67-64-1	71-43-2	56-23-5	67-66-3	106-93-4	75-34-3	107-06-2	156-59-2	100-41-4	75-09-2	90-12-0	91-57-6	91-20-3	127-18-4	108-88-3	71-55-6	79-01-6	95-63-6	108-67-8	75-01-4	1330-20-7	Varies
RCG Residential Groundwater Screening Level [1]			ug/L	14000	5	5	80	0.05	28	5	70	700	5	11	36	1.7	5	1000	200	5	56	60	2	10,000	Varies
Vapor Exposure GW Screening Level - Residential			ug/L	---	28	6.5	---	---	130	50	---	---	---	---	---	110	110	---	13000	9.1	---	---	2.1	---	Varies
Vapor Exposure GW Screening Level - Com/Ind			ug/L	---	120	28	---	---	550	210	---	---	---	---	---	460	470	---	54000	38	---	---	35	---	Varies
Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	**3.9 J**	<0.78	**6.7**	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	**66.0**	**49.1**	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	**4.3 J**	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	**18.7**	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-8 DUP	12/09/2020 14:46	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	TB	12/08/2020 08:00	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	**1.1 J**	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Field Duplicate RPD (SP-GW-1 & Dup) [2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Samples analyzed using EPA SW-846 Method 5030B/8260

ug/L = micrograms per liter

VOCs = Volatile Organic Compounds

BDL = Below Detection Limits

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

+ = Lead Scavengers

Table 6
Groundwater Analytical Results - PAHs

Project ID	Sample ID	Collected Date	Units	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
			CAS Number	83-32-9	208-96-8	120-12-7	56-55-3	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	53-70-3	206-44-0	86-73-7	193-39-5	90-12-0	91-57-6	91-20-3	85-01-8	129-00-0
RCG Residential Groundwater Screening Level [1]			ug/L	530	---	1800	0.3	0.2	2.5	---	25	250	0.25	800	290	2.5	11	36	1.7	---	120
Vapor Exposure GW Screening Level - Residential			ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	110	---	---
Vapor Exposure GW Screening Level - Com/Ind			ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	460	---	---
Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	<0.086	<0.075	<0.069	<0.066	<0.080	<0.046	<0.058	<0.10	<0.040	<0.059	<0.036	<0.077	<0.061	<0.11	<0.12	<0.11	<0.055	<0.076
Former Exide 20-224	SB-GW-6 DUP	12/09/2020 14:05	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	<0.089	<0.077	<0.071	<0.068	<0.082	<0.048	<0.059	<0.10	<0.041	<0.061	<0.037	<0.079	<0.063	<0.11	<0.12	<0.12	<0.056	<0.078
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	<0.089	<0.077	<0.071	<0.068	<0.082	<0.048	<0.059	<0.10	<0.041	<0.061	<0.037	<0.079	<0.063	<0.11	<0.12	<0.12	<0.056	<0.078
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	<0.091	<0.079	<0.073	<0.070	<0.084	<0.049	<0.061	<0.11	<0.042	<0.062	<0.038	<0.081	<0.064	<0.11	<0.13	<0.12	<0.058	<0.080
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	<0.091	<0.079	<0.073	<0.070	<0.084	<0.049	<0.061	<0.11	<0.042	<0.062	<0.038	<0.081	<0.064	<0.11	<0.13	<0.12	<0.058	<0.080
Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<0.082	<0.071	<0.066	<0.063	<0.076	<0.044	<0.055	<0.095	<0.038	<0.056	<0.034	<0.073	<0.058	<0.10	<0.11	<0.11	<0.052	<0.072
Field Duplicate RPD (SP-GW-1 & Dup) [2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Samples analyzed using EPA SW-846 Method 8270 SIM

ug/L -- micrograms per kilogram

ppb - parts per billion

PAHs - Polynuclear Aromatic Hydrocarbons

BDL - Below Detection Limits

--- No value given in the Remediation Closure Guide

Blank cells = Not Analyzed

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 7
Groundwater Analytical Results - Metals

Project ID	Sample ID	Collected Date	Units	Antimony	Arsenic	Arsenic - Field Filtered	Barium	Barium - Field Filtered	Beryllium	Beryllium - Field Filtered	Cadmium	Chromium ((Total) 6010)	Chromium VI (7199)	Copper	Lead	Lead - Field Filtered	Mercury (7470)	Nickel	Selenium	Silver	Thallium (6020)	Zinc
			CAS Number	7440-36-0	7440-38-2	7440-38-2	7440-39-3	7440-39-3	7440-41-7	7440-41-7	7440-43-9	7440-47-3	18540-29-9	7440-50-8	7439-92-1	7439-92-1	7439-97-6	7440-02-0	7782-49-2	7440-22-4	7440-28-0	7440-66-6
RCG Residential Groundwater Screening Level [1]			ug/L	6	10	10	2000	2000	4	4	5	100	0.35	1300	15	15	2	390	50	94	2	6000
EPA Secondary Drinking Water Standard [2]			ug/L	-	-	-	-	-	-	-	-	-	-	1000	-	-	-	-	-	100	-	5000
Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	<4.3	**78.5**	**4.7 J**	**554**		**1.6 J**		**1.2 J**	**99.3**		**108**	**1100**	**40.3**	**0.27 J**	**109**	<4.5	<1.4	**1.8**	**263**
Former Exide 20-224	SB-GW-6 DUP	12/09/2020 14:05	ug/L	<4.3	**52.7**		**406**		**0.87 J**		**0.74 J**	**67.1**		**70.8**	**726**		**0.18 J**	**73.8**	<4.5	<1.4	**1.2**	**174**
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	<4.3	**189**	**33.2**	**791**		**2.4 J**		**1.4 J**	**156**	**0.0997J**	**135**	**634**	**101**	**0.13 J**	**147**	<4.5	<1.4	**1.8**	**418**
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	<4.3	**15.2**		**166**		<0.29		**0.81 J**	**35.8**		**82.2**	**37.4**		<0.12	**52.6**	<4.5	<1.4	**0.69 J**	**142**
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	<4.3	**42.0**	**9.1 J**	**281**		<0.29		**1.6 J**	**85.8**		**127**	**331**	**32.2**	<0.12	**72.3**	<4.5	<1.4	**0.99 J**	**1690**
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	<4.3	**19.5**		**183**		<0.29		<0.41	**9.3 J**		**8.2 J**	**8.9 J**		<0.12	**9.6 J**	<4.5	<1.4	**0.086 J**	**29.9**
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	<4.3	**32.1**		**294**		<0.29		**0.48 J**	**33.4**		**47.6**	**55.0**		<0.12	**29.8**	<4.5	<1.4	**0.36 J**	**89.4**
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	<4.3	**5.2 J**		**139**		<0.29		<0.41	**9.4 J**		**5.2 J**	**5.1 J**		<0.12	**8.3 J**	<4.5	<1.4	**0.064 J**	**21.0**
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	<4.3	**11.3**		**148**		<0.29		**0.48 J**	**19.7**		**14.9**	**17.2**		<0.12	**20.4**	<4.5	<1.4	**0.26 J**	**45.4**
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	<4.3	**6.4 J**		**38.2**		<0.29		<0.41	**4.6 J**		**2.8 J**	<3.5		<0.12	**9.0 J**	<4.5	<1.4	<0.052	<8.7
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	<21.5	**462**	<3.8	**2230**	**135**	**8.0**	<0.18	**3.9**	**480**	<0.0400	**446**	**302**	<2.3	**1.9 J**	**402**	<4.5	<1.4	**1.7**	**1260**
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	<4.3	**5.7 J**		**109**		<0.29		<0.41	**8.0 J**		**6.2 J**	<3.5		<0.12	**7.9 J**	<4.5	<1.4	**0.060 J**	**14.0 J**
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	<4.3	**5.2 J**		**325**		<0.29		<0.41	**4.5 J**		**3.0 J**	<3.5		<0.12	**2.7 J**	<4.5	<1.4	<0.052	<8.7
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	<12.9	**202**	**41.9**	**645**		**4.4**	**2.0 J**	**4.3**	**217**	<0.0400	**307**	**172**	**41.1**	**0.20 J**	**309**	<4.5	<1.4	**2.6 J**	**809**
Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<4.3	<2.6		<0.79		<0.29		<0.41	<1.9		**2.7 J**	<3.5		<0.12	<1.2	<4.5	<1.4	<0.052	<8.7
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<4.3	<2.6		<0.79		<0.29		<0.41	<1.9		<1.8	<3.5		<0.12	<1.2	<4.5	<1.4	<0.052	<8.7
Field Duplicate RPD (SP-GW-1 & Dup) [3]			%	0.0%	**39.3%**		**30.8%**		**59.1%**		**47.4%**	**38.7%**		**41.6%**	**41.0%**		**40.0%**	**38.5%**	0.0%	0.0%	**40.0%**	**40.7%**

Notes:

Samples analyzed using EPA Methods 6010 and 6020 (Metals)

Hexavalent Chromium samples Field Filtered and analyzed using EPA Method 7199

ug/L -- micrograms per Liter

ppb - parts per billion

Blank cells = Not Analyzed

--- No value given in the Remediation Closure Guide

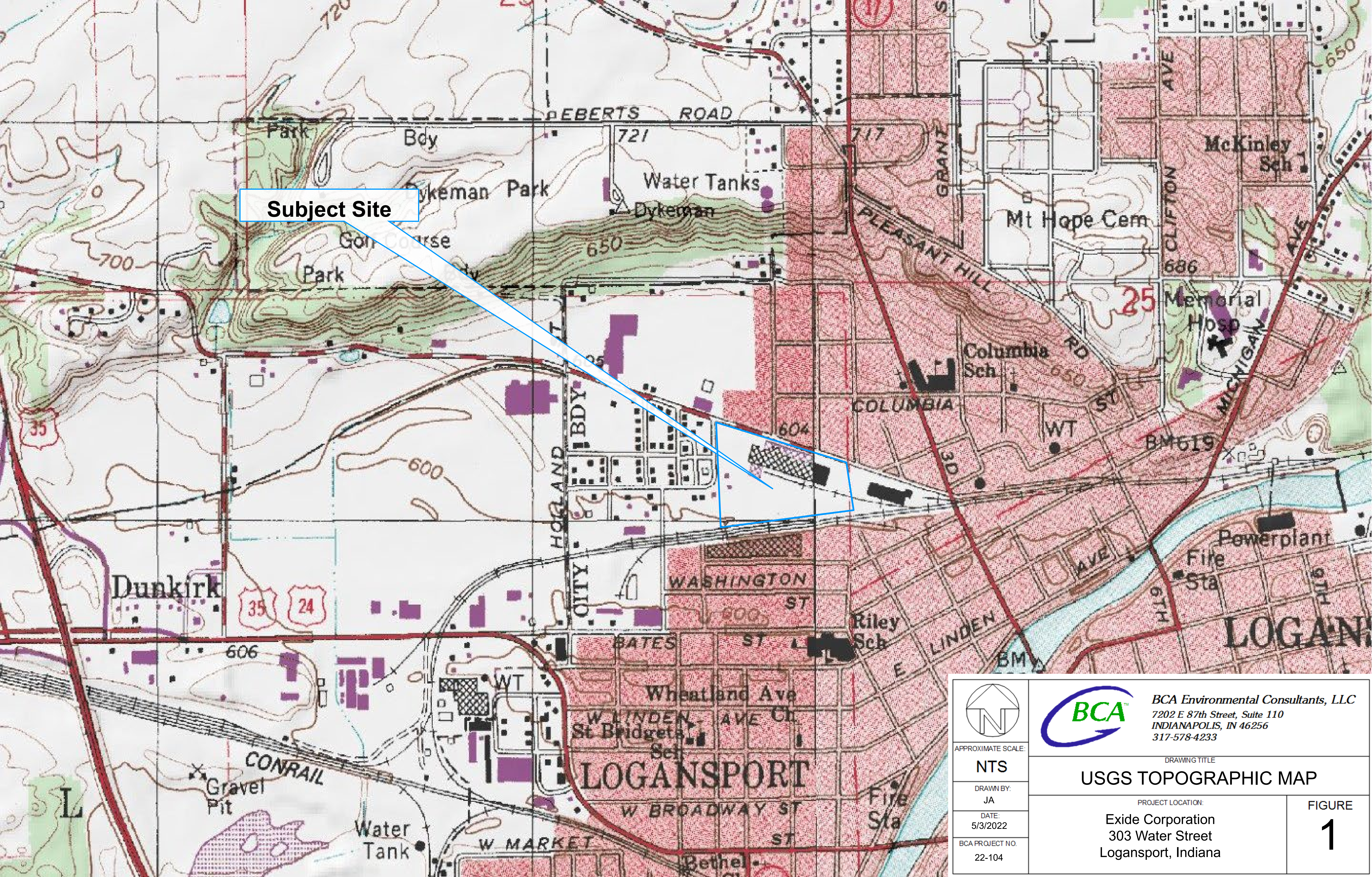
[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2020

[2] Secondary Standard for total dissolved solids (TDS)

[3] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Figures

Supplemental Phase II Environmental Site Assessment
Former Exide Corporation
303 Water Street
Logansport, IN



N

APPROXIMATE SCALE: NTS

DRAWN BY: JA

DATE: 5/3/2022

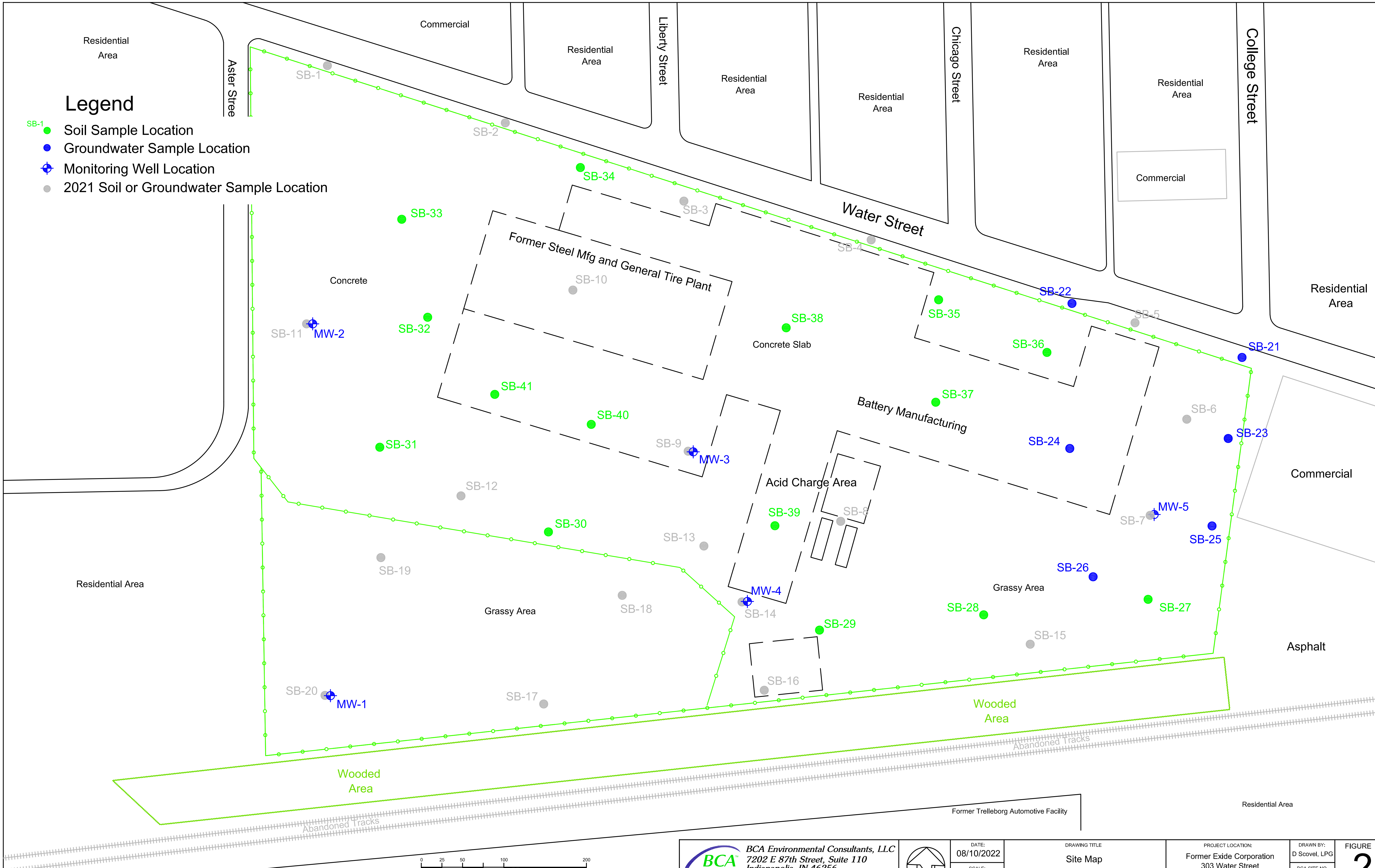
BCA PROJECT NO. 22-104

BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
INDIANAPOLIS, IN 46256
317-578-4233

DRAWING TITLE
USGS TOPOGRAPHIC MAP

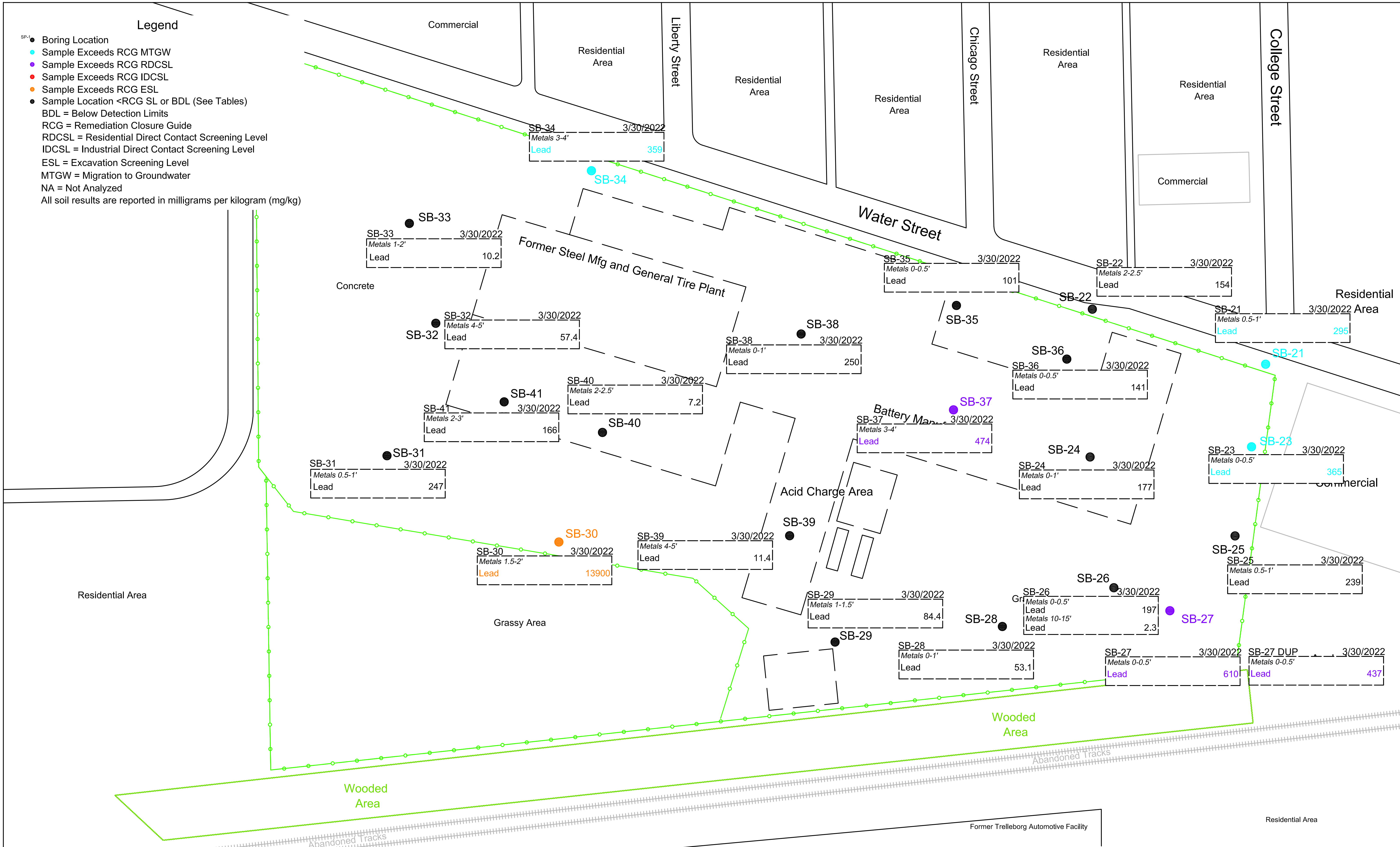
PROJECT LOCATION:
Exide Corporation
303 Water Street
Logansport, Indiana

FIGURE
1



BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
08/10/2022	Site Map	Former Exide Corporation	D Scovel, LPG	2
SCALE: 1" = 100'	Soil Boring & Groundwater Sample Locations	303 Water Street, Logansport, Indiana	BCA SITE NO. 8130	



BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233

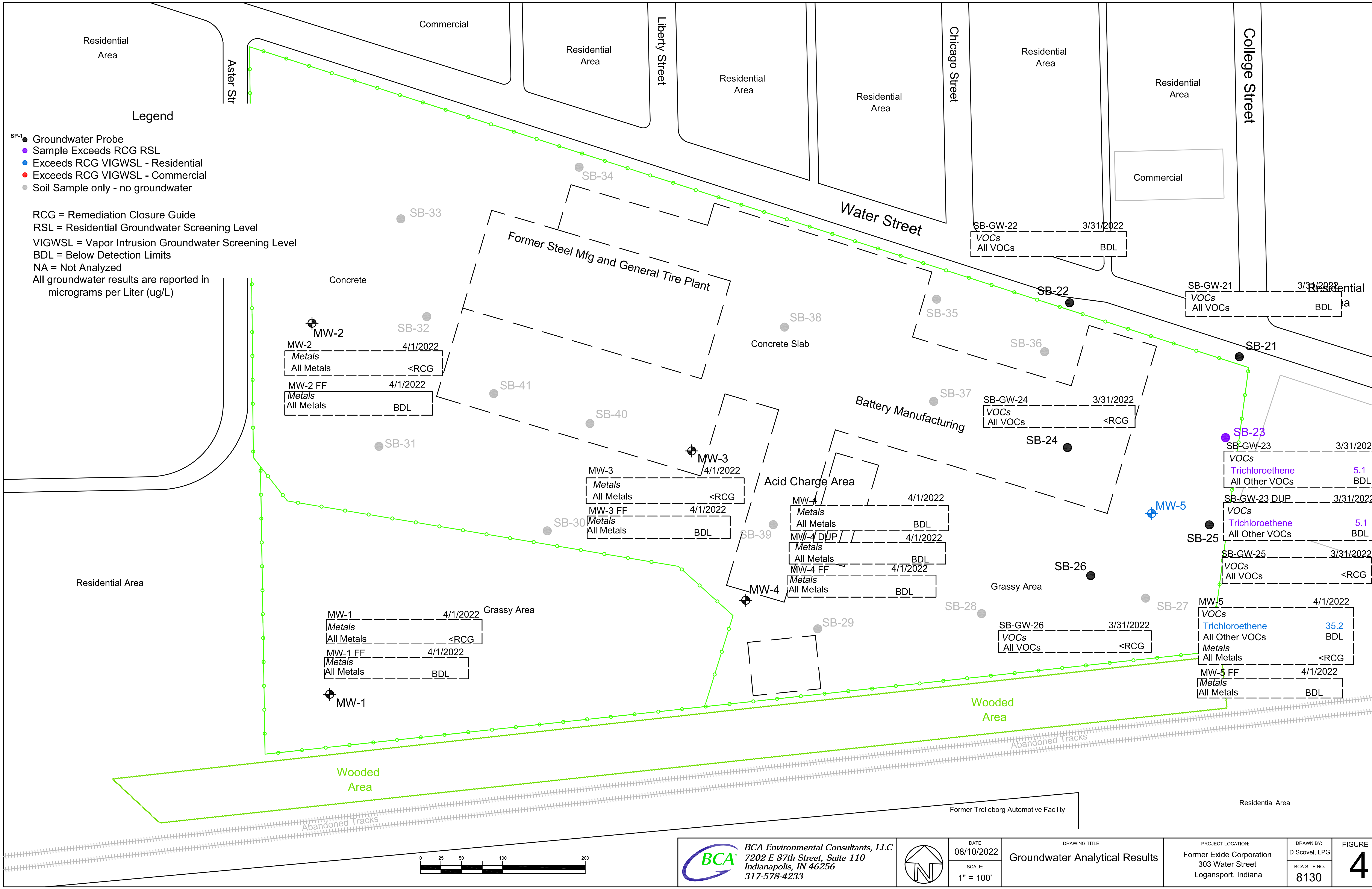
DATE: 08/10/2022
SCALE: 1" = 100'

DRAWING TITLE: Soil Analytical Results

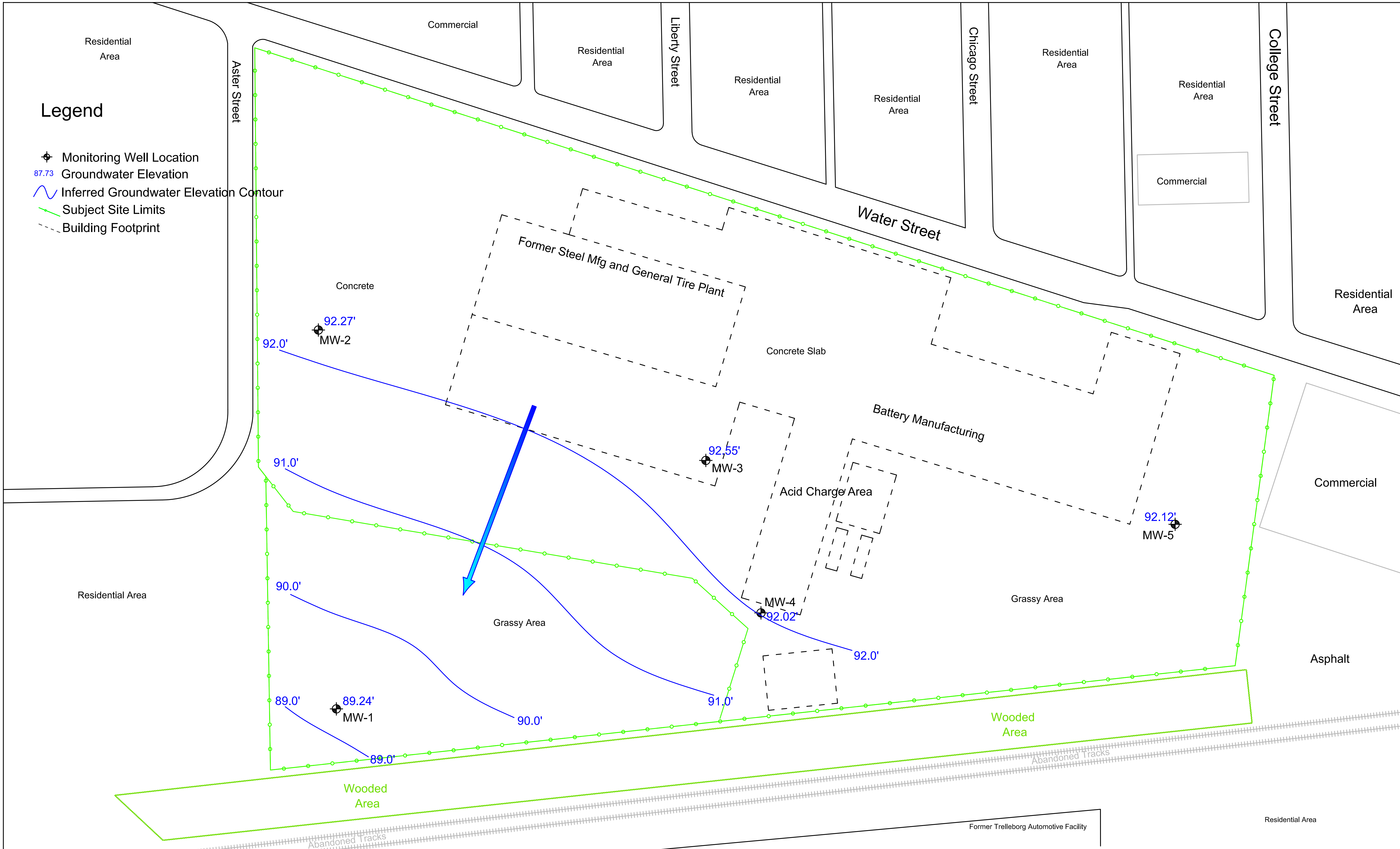
PROJECT LOCATION: Former Exide Corporation, 303 Water Street, Logansport, Indiana

DRAWN BY: D Scovel, LPG
BCA SITE NO. 8130

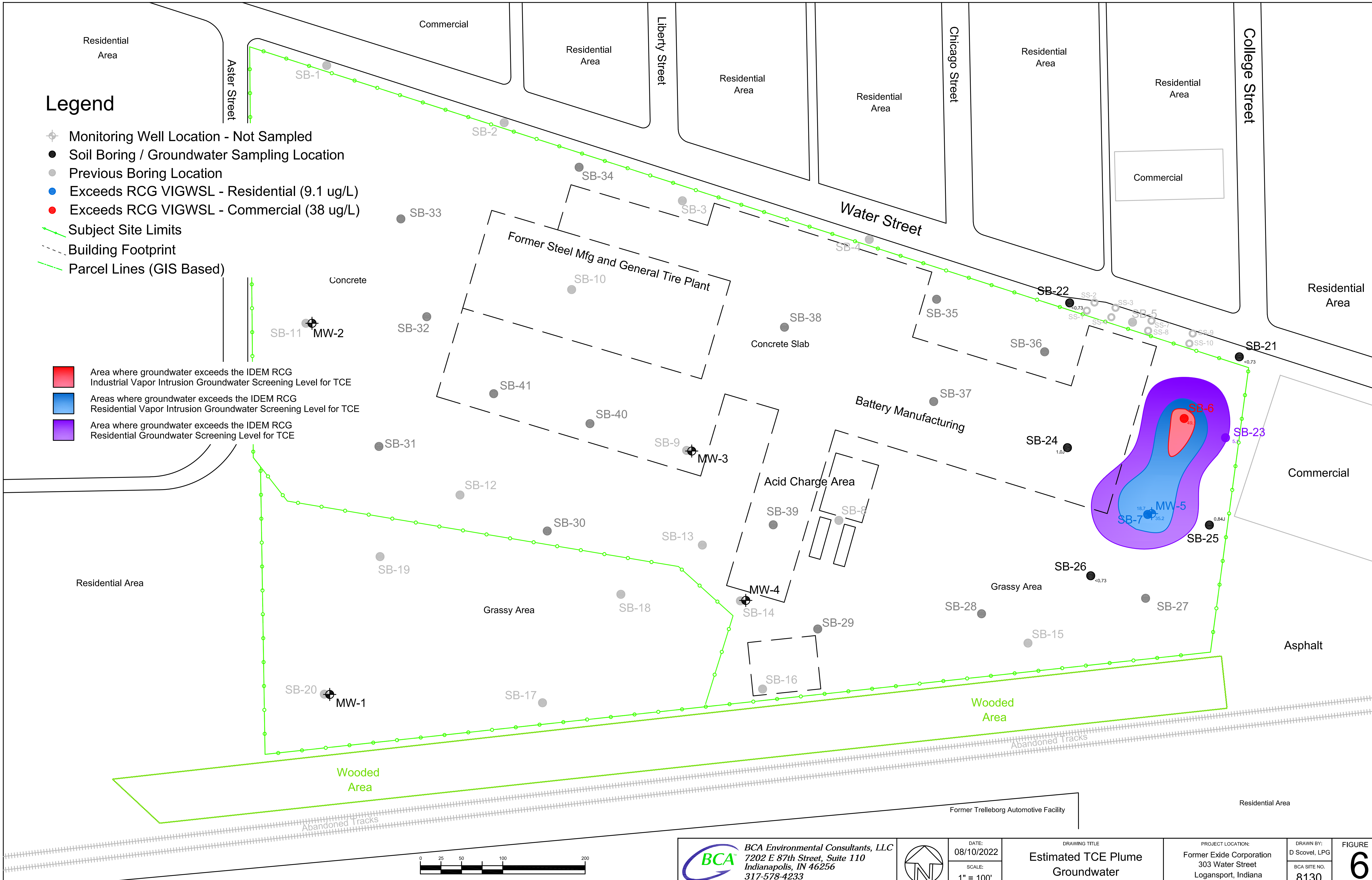
FIGURE 3



Legend
Groundwater Probe
Sample Exceeds RCG RSL
Exceeds RCG VIGWSL - Residential
Exceeds RCG VIGWSL - Commercial
Soil Sample only - no groundwater
RCG = Remediation Closure Guide
RSL = Residential Groundwater Screening Level
VIGWSL = Vapor Intrusion Groundwater Screening Level
BDL = Below Detection Limits
NA = Not Analyzed
All groundwater results are reported in micrograms per Liter (ug/L)
Residential Area
Commercial
Aster Str
Liberty Street
Chicago Street
College Street
Water Street
Former Steel Mfg and General Tire Plant
Concrete
Concrete Slab
Battery Manufacturing
Acid Charge Area
Grassy Area
Residential Area
Wooded Area
Abandoned Tracks
Former Trelleborg Automotive Facility
SB-21
SB-22
SB-23
SB-24
SB-25
SB-26
SB-27
SB-28
SB-29
SB-30
SB-31
SB-32
SB-33
SB-34
SB-35
SB-36
SB-37
SB-38
SB-39
SB-40
SB-41
MW-1
MW-2
MW-3
MW-4
MW-5
SB-GW-22 3/31/2022 VOCs All VOCs BDL
SB-GW-21 3/31/2022 VOCs All VOCs BDL
SB-GW-24 3/31/2022 VOCs All VOCs <RCG
SB-GW-23 3/31/2022 VOCs Trichloroethene 5.1 All Other VOCs BDL
SB-GW-23 DUP 3/31/2022 VOCs Trichloroethene 5.1 All Other VOCs BDL
SB-GW-25 3/31/2022 VOCs All VOCs <RCG
SB-GW-26 3/31/2022 VOCs All VOCs <RCG
MW-5 4/1/2022 VOCs Trichloroethene 35.2 All Other VOCs BDL Metals All Metals <RCG
MW-5 FF 4/1/2022 Metals All Metals BDL
MW-2 4/1/2022 Metals All Metals <RCG
MW-2 FF 4/1/2022 Metals All Metals BDL
MW-3 4/1/2022 Metals All Metals <RCG
MW-3 FF 4/1/2022 Metals All Metals BDL
MW-4 4/1/2022 Metals All Metals BDL
MW-4 DUP 4/1/2022 Metals All Metals BDL
MW-4 FF 4/1/2022 Metals All Metals BDL
MW-1 4/1/2022 Metals All Metals <RCG
MW-1 FF 4/1/2022 Metals All Metals BDL
0 25 50 100 200
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
DATE: 08/10/2022
SCALE: 1" = 100'
DRAWING TITLE: Groundwater Analytical Results
PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana
DRAWN BY: D Scovel, LPG
BCA SITE NO. 8130
FIGURE 4



BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	N	DATE: 04/12/2021 SCALE: 1" = 100'	DRAWING TITLE Groundwater Elevation Map March 2021 Data	PROJECT LOCATION: One General LLC One General St Logansport, Indiana	DRAWN BY: D Scovel, LPG BCA PROJECT NO. 22-104	FIGURE 5



Legend
Monitoring Well Location - Not Sampled
Soil Boring / Groundwater Sampling Location
Previous Boring Location
Exceeds RCG VIGWSL - Residential (9.1 ug/L)
Exceeds RCG VIGWSL - Commercial (38 ug/L)
Subject Site Limits
Building Footprint
Parcel Lines (GIS Based)
Area where groundwater exceeds the IDEM RCG Industrial Vapor Intrusion Groundwater Screening Level for TCE
Areas where groundwater exceeds the IDEM RCG Residential Vapor Intrusion Groundwater Screening Level for TCE
Area where groundwater exceeds the IDEM RCG Residential Groundwater Screening Level for TCE
Residential Area
Commercial
Aster Street
Liberty Street
Chicago Street
College Street
Water Street
Former Steel Mfg and General Tire Plant
Battery Manufacturing
Acid Charge Area
Concrete
Concrete Slab
Grassy Area
Wooded Area
Asphalt
Abandoned Tracks
Former Trelleborg Automotive Facility
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
SB-8
SB-9
SB-10
SB-11
SB-12
SB-13
SB-14
SB-15
SB-16
SB-17
SB-18
SB-19
SB-20
SB-21
SB-22
SB-23
SB-24
SB-25
SB-26
SB-27
SB-28
SB-29
SB-30
SB-31
SB-32
SB-33
SB-34
SB-35
SB-36
SB-37
SB-38
SB-39
SB-40
SB-41
MW-1
MW-2
MW-3
MW-4
MW-5
SS-1
SS-2
SS-3
SS-4
SS-7
SS-8
SS-9
SS-10
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
DATE: 08/10/2022
SCALE: 1" = 100'
DRAWING TITLE: Estimated TCE Plume Groundwater
PROJECT LOCATION: Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY: D Scovel, LPG
BCA SITE NO. 8130
FIGURE 6
0 25 50 100 200

Tables

Supplemental Phase II Environmental Site Assessment
Former Exide Corporation
303 Water Street
Logansport, IN

Table 1
Soil Analytical Results - Metals

Project ID	Sample ID	Collected Date	Units	Antimony	Arsenic	Copper	Lead	Thallium - 6020
	CAS Number			7440-36-0	7440-38-2	7440-50-8	7439-92-1	7440-28-0
RCG Residential Direct Contact Screening Level [1]			**mg/kg**	**43**	**9.5**	**4300**	**400**	**1.1**
RCG Commercial/Industrial Direct Contact Screening Level [1]			**mg/kg**	**470**	**30**	**47000**	**800**	**12**
RCG Excavation Screening Level [1]			**mg/kg**	**790**	**920**	**79000**	**1000**	**20**
RCG Soil Migration to GW Screening Level [1]			**mg/kg**	**5.4**	**5.9**	**920**	**270**	**2.9**

Former Exide Corporation - 2021 Phase II

Project ID	Sample ID	Collected Date	Units	Antimony	Arsenic	Copper	Lead	Thallium - 6020
Former Exide 20-224	SB-1 0-1'	12/07/2020 09:20	mg/kg	<0.27	**18.3**	**29.2**	**85.4**	**1.7**
Former Exide 20-224	SB-2 0-1'	12/07/2020 09:40	mg/kg	<0.21	**5.2**	**17.5**	**70.4**	<0.22
Former Exide 20-224	SB-3 0-1'	12/07/2020 10:20	mg/kg	**2.8**	**16.5**	**60.0**	**1160**	<0.24
Former Exide 20-224	SB-4 3-4'	12/07/2020 09:50	mg/kg	<0.26	**19.7**	**32.5**	**125**	**0.33 J**
Former Exide 20-224	SB-5 0-1'	12/07/2020 10:05	mg/kg	**3.0**	**12.4**	**34.4**	**873**	**0.25 J**
Former Exide 20-224	SB-6 0-2'	12/07/2020 14:50	mg/kg	**16.4**	**11.0**	**22.5**	**6630**	<0.21
Former Exide 20-224	SB-7 0-2'	12/07/2020 14:25	mg/kg	**3.4**	**5.0**	**8.9**	**1990**	<0.45
Former Exide 20-224	SB-8 0-2'	12/08/2020 09:10	mg/kg	**24.8**	**10.5**	**85.0**	**1470**	<0.21
Former Exide 20-224	SB-9 2-4'	12/07/2020 15:20	mg/kg	<0.21	**14.1**	**286**	**1170**	<0.22
Former Exide 20-224	SB-10 2-4'	12/08/2020 09:35	mg/kg	**0.41 J**	**6.0**	**30.5**	**57.3**	**0.52 J**
Former Exide 20-224	SB-11 0-2'	12/08/2020 10:35	mg/kg	**0.28 J**	**5.9**	**16.4**	**95.6**	<0.24
Former Exide 20-224	SB-12 0-2'	12/08/2020 10:05	mg/kg	**4.1**	**17.3**	**120**	**1090**	<0.23
Former Exide 20-224	SB-13 0-1'	12/08/2020 10:55	mg/kg	**13.3**	**16.8**	**89.6**	**2420**	<0.32
Former Exide 20-224	SB-14 1-2'	12/08/2020 10:40	mg/kg	**2.9**	**11.4**	**56.7**	**573**	**0.24 J**
Former Exide 20-224	SB-14 1-2' DUP	12/08/2020 10:40	mg/kg	**3.5**	**10.8**	**98.7**	**2140**	**0.37 J**
Former Exide 20-224	SB-15 0-2'	12/07/2020 14:10	mg/kg	**3.2**	**10.1**	**59.0**	**140**	**0.39 J**
Former Exide 20-224	SB-16 0-2'	12/07/2020 13:20	mg/kg	<0.19	**12.9**	**9.6**	**28.7**	<0.20
Former Exide 20-224	SB-17 0-2'	12/07/2020 11:50	mg/kg	**5.9**	**16.9**	**62.0**	**517**	**0.67 J**
Former Exide 20-224	SB-18 0-2'	12/07/2020 12:30	mg/kg	**0.30 J**	**16.7**	**26.0**	**91.4**	<0.43
Former Exide 20-224	SB-19 0-2'	12/07/2020 11:35	mg/kg	**1.5**	**11.2**	**63.9**	**162**	**1.1**
Former Exide 20-224	SB-20 0-2'	12/07/2020 11:15	mg/kg	**1.7**	**13.9**	**93.8**	**162**	**0.73 J**
Former Exide 20-224	SS-1	12/07/2020 10:00	mg/kg				**7360**	
Former Exide 20-224	SS-2	12/09/2020 10:30	mg/kg				**6070**	
Former Exide 20-224	SS-4	12/09/2020 10:34	mg/kg				**8570**	
Former Exide 20-224	SS-5	12/09/2020 10:36	mg/kg				**5620**	
Former Exide 20-224	SS-6	12/09/2020 10:40	mg/kg				**6200**	
Former Exide 20-224	SS-7	12/09/2020 10:42	mg/kg				**4510**	
Former Exide 20-224	SS-8	12/09/2020 10:44	mg/kg				**10300**	
Former Exide 20-224	SS-9	12/09/2020 10:46	mg/kg				**4840**	
Field Duplicate RPD (SB-14 1-2' & Dup)[2]			%	**18.8%**	**5.4%**	**54.1%**	**115.5%**	**42.6%**

Former Exide Corporation - 2022 Supplemental Phase II

Project ID	Sample ID	Collected Date	Units	Antimony	Arsenic	Copper	Lead	Thallium - 6020
Exide	SB-21 (0.5-1)	03/30/2022 16:10	mg/kg				**295**	
Exide	SB-22 (2-2.5)	03/30/2022 16:40	mg/kg				**154**	
Exide	SB-23 (0-0.5)	03/30/2022 15:50	mg/kg				**365**	
Exide	SB-24 (0-1)	03/31/2022 10:55	mg/kg				**177**	
Exide	SB-25 (0.5-1)	03/30/2022 15:20	mg/kg				**239**	
Exide	SB-26 (0-0.5)	03/30/2022 14:55	mg/kg				**197**	
Exide	SB-26 (10-15)	03/30/2022 15:05	mg/kg				**2.3**	
Exide	SB-27 (0-0.5)	03/30/2022 13:44	mg/kg				**610**	
Exide	SB-27 (0-0.5) DUP	03/30/2022 13:44	mg/kg				**437**	
Exide	SB-28 (0-1)	03/30/2022 14:00	mg/kg				**53.1**	
Exide	SB-29 (1-1.5)	03/30/2022 13:10	mg/kg				**84.4**	
Exide	SB-30 (1.5-2.0)	03/30/2022 10:17	mg/kg				**13900**	
Exide	SB-31 (0.5-1.0)	03/30/2022 10:25	mg/kg				**247**	
Exide	SB-32 (4-5)	03/31/2022 10:37	mg/kg				**57.4**	
Exide	SB-33 (1.0-2.0)	03/30/2022 11:34	mg/kg				**10.2**	
Exide	SB-34 (3-4)	03/30/2022 14:20	mg/kg				**359**	
Exide	SB-35 (0-0.5)	03/30/2022 12:29	mg/kg				**101**	
Exide	SB-36 (0-0.5)	03/30/2022 12:49	mg/kg				**141**	
Exide	SB-37 (3-4)	03/30/2022 12:07	mg/kg				**474**	
Exide	SB-38 (0-1.0)	03/30/2022 11:44	mg/kg				**250**	
Exide	SB-39 (4-5)	03/30/2022 13:26	mg/kg				**11.4**	
Exide	SB-40 (2-2.5)	03/30/2022 09:51	mg/kg				**7.2**	
Exide	SB-41 (2-3)	03/30/2022 10:03	mg/kg				**166**	
Field Duplicate RPD (SP-27 0-0.5' & Dup)[2]			%				**33.0%**	

Notes:

Samples alyzed using EPA Method 6010, 6020, 7471 (Metals)

mg/kg = milligrams per kilogram

ppm - parts per million

Blank cells = Not Analyzed

--- No value given in the Remediation Closure Guide

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2022

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Table 2
Groundwater Analytical Results - VOCs

Project ID	Sample ID	Collected Date	Units	Acetone	Benzene	Carbon tetrachloride	Chloroform	1,2-Dibromoethane (EDB)+	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Methylene Chloride	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	Xylene (Total)	Other VOCs
			CAS Number	67-64-1	71-43-2	56-23-5	67-66-3	106-93-4	75-34-3	107-06-2	156-59-2	100-41-4	75-09-2	90-12-0	91-57-6	91-20-3	127-18-4	108-88-3	71-55-6	79-01-6	95-63-6	108-67-8	75-01-4	1330-20-7	Varies
RCG Residential Groundwater Screening Level [1]			ug/L	18000	5	5	80	0.05	28	5	70	700	5	11	36	1.2	5	1000	200	5	56	60	2	10,000	Varies
Vapor Exposure GW Screening Level - Residential			ug/L	---	28	6.5	---	---	130	50	---	---	---	---	---	110	110	---	13000	9.1	---	---	2.1	---	Varies
Vapor Exposure GW Screening Level - Com/Ind			ug/L	---	120	28	---	---	550	210	---	---	---	---	---	460	470	---	54000	38	---	---	35	---	Varies
Former Exide Corporation - 2021 Phase II ESA																									
Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	**3.9 J**	<0.78	**6.7**	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	**66.0**	**49.1**	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	**4.3 J**	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	**18.7**	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-8 DUP	12/09/2020 14:46	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	<8.1	<0.51	<0.68	<0.50	<1.2	<0.73	<0.78	<1.3	<0.57	<2.2	<1.1	<0.43	<0.40	<0.83	<0.47	<0.52	<1.1	<0.43	<0.46	<0.42	<0.89	BDL
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	DRUM	12/09/2020 18:30	ug/L	**14.7 J**	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	**0.87 J**	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	<0.75	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Former Exide 20-224	TB	12/08/2020 08:00	ug/L	<6.4	<0.50	<0.89	<0.69	<1.1	<0.85	<0.81	<0.96	<0.49	<1.8	<0.78	<0.43	<0.44	**1.1 J**	<0.43	<0.70	<0.73	<0.41	<0.40	<0.46	<0.72	BDL
Field Duplicate RPD (SB-GW-8 & Dup) [2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Former Exide Corporation - 2022 Supplemental Phase II ESA																									
Exide	SB-GW-21	03/31/2022 12:26	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	<0.73	<0.78	<0.75	<0.42	<0.79	BDL
Exide	SB-GW-22	03/31/2022 13:23	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	<0.73	<0.78	<0.75	<0.42	<0.79	BDL
Exide	SB-GW-23	03/31/2022 10:38	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	**1.3 J**	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	**1.8 J**	**5.1**	<0.78	<0.75	<0.42	<0.79	BDL
Exide	SB-GW-23 DUP	03/31/2022 10:38	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	**1.3 J**	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	**1.6 J**	**5.1**	<0.78	<0.75	<0.42	<0.79	BDL
Exide	SB-GW-24	03/31/2022 16:02	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	**1.0 J**	<0.78	<0.75	<0.42	<0.79	BDL
Exide	SB-GW-25	03/31/2022 09:34	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	**0.84 J**	<0.78	<0.75	<0.42	<0.79	BDL
Exide	SB-GW-26	03/31/2022 14:28	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	<0.73	<0.78	<0.75	<0.42	<0.79	BDL
Exide	MW-5	04/01/2022 09:54	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	**6.8**	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	**35.2**	<0.78	<0.75	<0.42	<0.79	BDL
Exide	EB-1	04/01/2022 15:27	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	<0.73	<0.78	<0.75	<0.42	<0.79	BDL
Exide	TB-1	04/01/2022 16:00	ug/L	<3.2	<0.73	<0.70	<0.70	<0.69	<0.78	<0.66	<0.79	<0.68	<0.32	<0.58	<0.80	<0.65	<0.70	<0.73	<0.69	<0.73	<0.78	<0.75	<0.42	<0.79	BDL
Field Duplicate RPD (SB-GW-23 & Dup) [2]			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**11.8%**	**0.0%**	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Samples analyzed using EPA SW-846 Method 5030B/8260

ug/L = micrograms per liter

VOCs = Volatile Organic Compounds

BDL = Below Detection Limits

[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2022

[2] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

+ = Lead Scavengers

Table 3
Groundwater Analytical Results - Metals

Project ID	Sample ID	Collected Date	Units	Arsenic	Arsenic - Field Filtered	Barium	Barium - Field Filtered	Beryllium	Beryllium - Field Filtered	Cadmium	Chromium (Total) 6010	Chromium VI 7199	Copper	Lead	Lead - Field Filtered	Mercury	Nickel	Selenium	Silver	Thallium 6020	Zinc
			CAS Number	7440-38-2	7440-38-2	7440-39-3	7440-39-3	7440-41-7	7440-41-7	7440-43-9	7440-47-3	18540-29-9	7440-50-8	7439-92-1	7439-92-1	7439-97-6	7440-02-0	7782-49-2	7440-22-4	7440-28-0	7440-66-6
RCG Residential Groundwater Screening Level [1]			ug/L	10	10	2000	2000	4	4	5	100	0.35	1300	15	15	2	390	50	94	2	6000
EPA Secondary Drinking Water Standard [2]			ug/L	-	-	-	-	-	-	-	-	-	1000	-	-	-	-	-	100	-	5000
Former Exide Corporation - 2021 Phase II																					
Former Exide 20-224	SB-GW-6	12/09/2020 14:05	ug/L	78.5	4.7 J	554		1.6 J		1.2 J	99.3		108	1100	40.3	0.27 J	109	<4.5	<1.4	1.8	263
Former Exide 20-224	SB-GW-6 DUP	12/09/2020 14:05	ug/L	52.7		406		0.87 J		0.74 J	67.1		70.8	726		0.18 J	73.8	<4.5	<1.4	1.2	174
Former Exide 20-224	SB-GW-7	12/09/2020 12:47	ug/L	189	33.2	791		2.4 J		1.4 J	156	0.0997J	135	634	101	0.13 J	147	<4.5	<1.4	1.8	418
Former Exide 20-224	SB-GW-8	12/09/2020 14:46	ug/L	15.2		166		<0.29		0.81 J	35.8		82.2	37.4		<0.12	52.6	<4.5	<1.4	0.69 J	142
Former Exide 20-224	SB-GW-9	12/09/2020 15:40	ug/L	42.0	9.1 J	281		<0.29		1.6 J	85.8		127	331	32.2	<0.12	72.3	<4.5	<1.4	0.99 J	1690
Former Exide 20-224	SB-GW-10	12/09/2020 16:17	ug/L	19.5		183		<0.29		<0.41	9.3 J		8.2 J	8.9 J		<0.12	9.6 J	<4.5	<1.4	0.086 J	29.9
Former Exide 20-224	SB-GW-11	12/09/2020 17:47	ug/L	32.1		294		<0.29		0.48 J	33.4		47.6	55.0		<0.12	29.8	<4.5	<1.4	0.36 J	89.4
Former Exide 20-224	SB-GW-12	12/09/2020 16:59	ug/L	5.2 J		139		<0.29		<0.41	9.4 J		5.2 J	5.1 J		<0.12	8.3 J	<4.5	<1.4	0.064 J	21.0
Former Exide 20-224	SB-GW-15	12/09/2020 11:46	ug/L	11.3		148		<0.29		0.48 J	19.7		14.9	17.2		<0.12	20.4	<4.5	<1.4	0.26 J	45.4
Former Exide 20-224	SB-GW-16	12/09/2020 10:45	ug/L	6.4 J		38.2		<0.29		<0.41	4.6 J		2.8 J	<3.5		<0.12	9.0 J	<4.5	<1.4	<0.052	<8.7
Former Exide 20-224	SB-GW-17	12/09/2020 08:52	ug/L	462	<3.8	2230	135	8.0	<0.18	3.9	480	<0.0400	446	302	<2.3	1.9 J	402	<4.5	<1.4	1.7	1260
Former Exide 20-224	SB-GW-18	12/08/2020 14:10	ug/L	5.7 J		109		<0.29		<0.41	8.0 J		6.2 J	<3.5		<0.12	7.9 J	<4.5	<1.4	0.060 J	14.0 J
Former Exide 20-224	SB-GW-19	12/08/2020 15:13	ug/L	5.2 J		325		<0.29		<0.41	4.5 J		3.0 J	<3.5		<0.12	2.7 J	<4.5	<1.4	<0.052	<8.7
Former Exide 20-224	SB-GW-20	12/08/2020 16:16	ug/L	202	41.9	645		4.4	2.0 J	4.3	217	<0.0400	307	172	41.1	0.20 J	309	<4.5	<1.4	2.6 J	809
Former Exide 20-224	DRUM	12/09/2020 18:30	ug/L	75.1		430		0.95 J		1.2 J	90.3		120	233		<0.12	89.9	<4.5	<1.4	1.1	530
Former Exide 20-224	EB-1	12/08/2020 16:55	ug/L	<2.6		<0.79		<0.29		<0.41	<1.9		2.7 J	<3.5		<0.12	<1.2	<4.5	<1.4	<0.052	<8.7
Former Exide 20-224	EB-2	12/09/2020 18:20	ug/L	<2.6		<0.79		<0.29		<0.41	<1.9		<1.8	<3.5		<0.12	<1.2	<4.5	<1.4	<0.052	<8.7
Field Duplicate RPD (SB-GW-6 & Dup) [3]			%	39.3%		30.8%		59.1%		47.4%	38.7%		41.6%	41.0%		40.0%	38.5%	0.0%	0.0%	40.0%	40.7%
Former Exide Corporation - 2022 Supplemental Phase II																					
Exide	MW-1	04/01/2022 12:37	ug/L	7.5 J	<3.8									13.2	<2.3						
Exide	MW-2	04/01/2022 11:46	ug/L	4.6 J	<3.8									<2.3	<2.3						
Exide	MW-3	04/01/2022 10:50	ug/L	4.8 J	<3.8									<2.3	<2.3						
Exide	MW-4	04/01/2022 13:15	ug/L	<3.8	<3.8									<2.3	<2.3						
Exide	MW-4 DUP	04/01/2022 13:15	ug/L	<3.8										<2.3							
Exide	MW-5	04/01/2022 09:54	ug/L	<3.8	<3.8									2.4 J	<2.3						
Field Duplicate RPD (MW-4 & Dup) [3]			%	0.0%										0.0%							

Notes:

Samples analyzed using EPA Methods 6010 and 6020 (Metals)

Hexavalent Chromium samples Field Filtered and analyzed using EPA Method 7199

ug/L -- micrograms per Liter

ppb - parts per billion

Blank cells = Not Analyzed

--- No value given in the Remediation Closure Guide

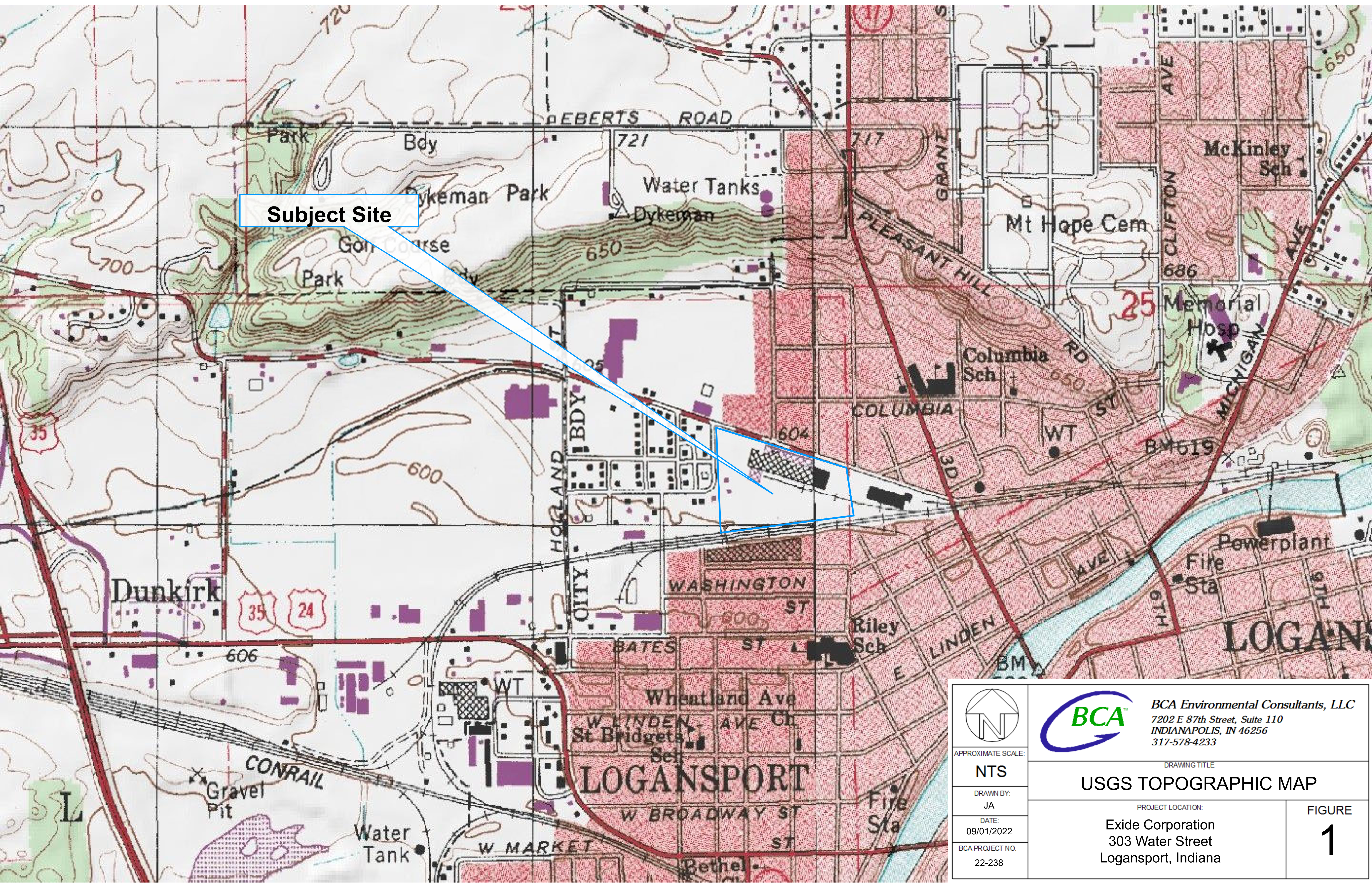
[1] Remediation Closure Guide, Appendix A, Table A-6: Screening Level Summary Table - 2022

[2] Secondary Standard for total dissolved solids (TDS)

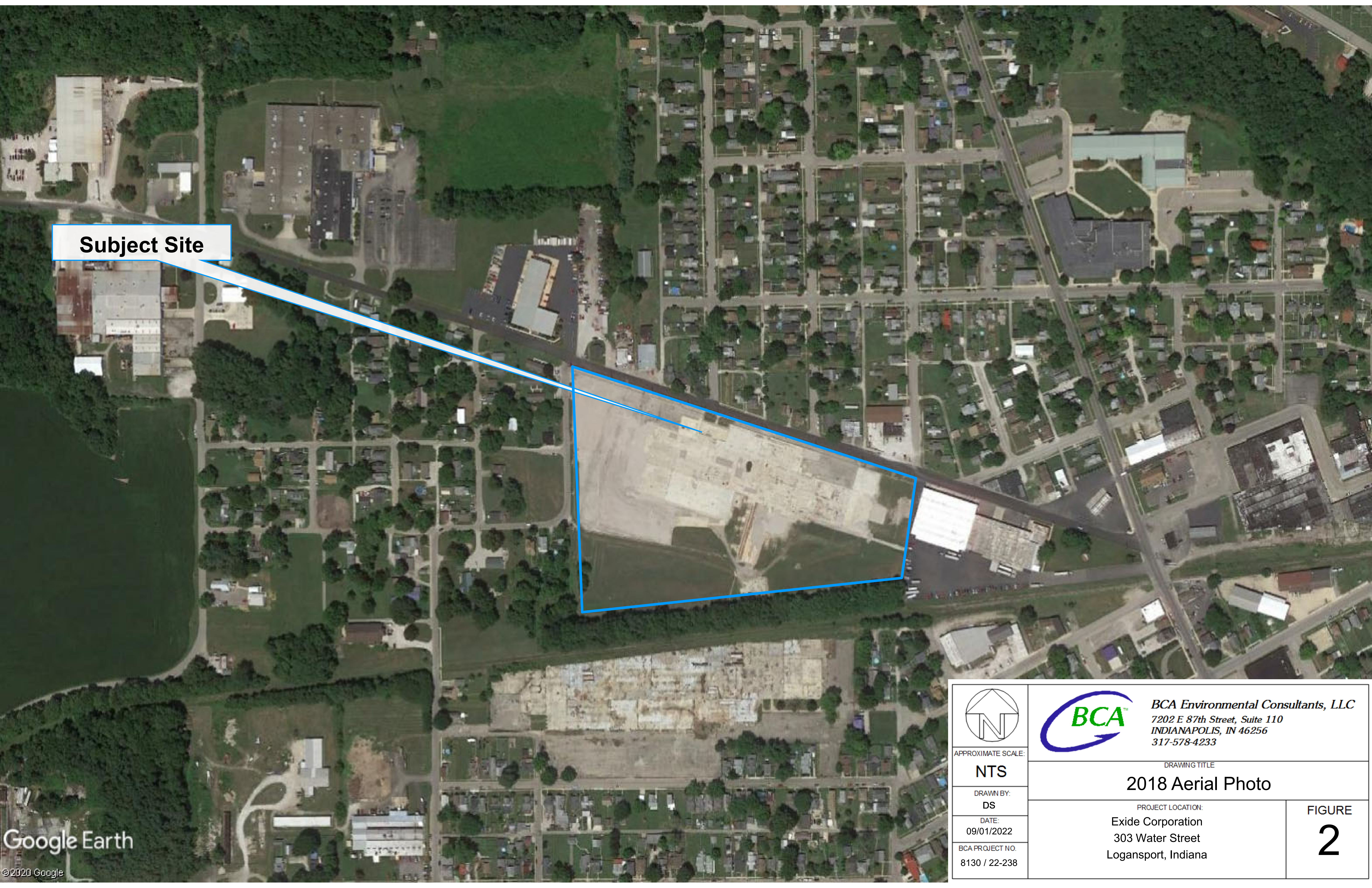
[3] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

Figures

2nd Supplemental Phase II Environmental Site Assessment
Former Exide Corporation
303 Water Street
Logansport, IN



Subject Site
EBERTS ROAD
Dykeman Park
Golf Course
Water Tanks
PLEASANT HILL RD
Mt Hope Cem
McKinley Sch
Memorial Hosp
Columbia Sch
COLUMBIA ST
HOLLAND BDY
CITY BDY
WASHINGTON ST
BATES ST
Riley Sch
E LINDEN AVE
Wheatland Ave
W LINDEN AVE
St Bridgets Sch
LOGANSPORT
W BROADWAY ST
W MARKET ST
CONRAIL
Gravel Pit
Water Tank
Dunkirk
Powerplant
Fire Sta
APPROXIMATE SCALE:
NTS
DRAWN BY:
JA
DATE:
09/01/2022
BCA PROJECT NO.
22-238
BCA
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
INDIANAPOLIS, IN 46256
317-578-4233
DRAWING TITLE
USGS TOPOGRAPHIC MAP
PROJECT LOCATION:
Exide Corporation
303 Water Street
Logansport, Indiana
FIGURE
1



APPROXIMATE SCALE: NTS

DRAWN BY: DS

DATE: 09/01/2022

BCA PROJECT NO. 8130 / 22-238

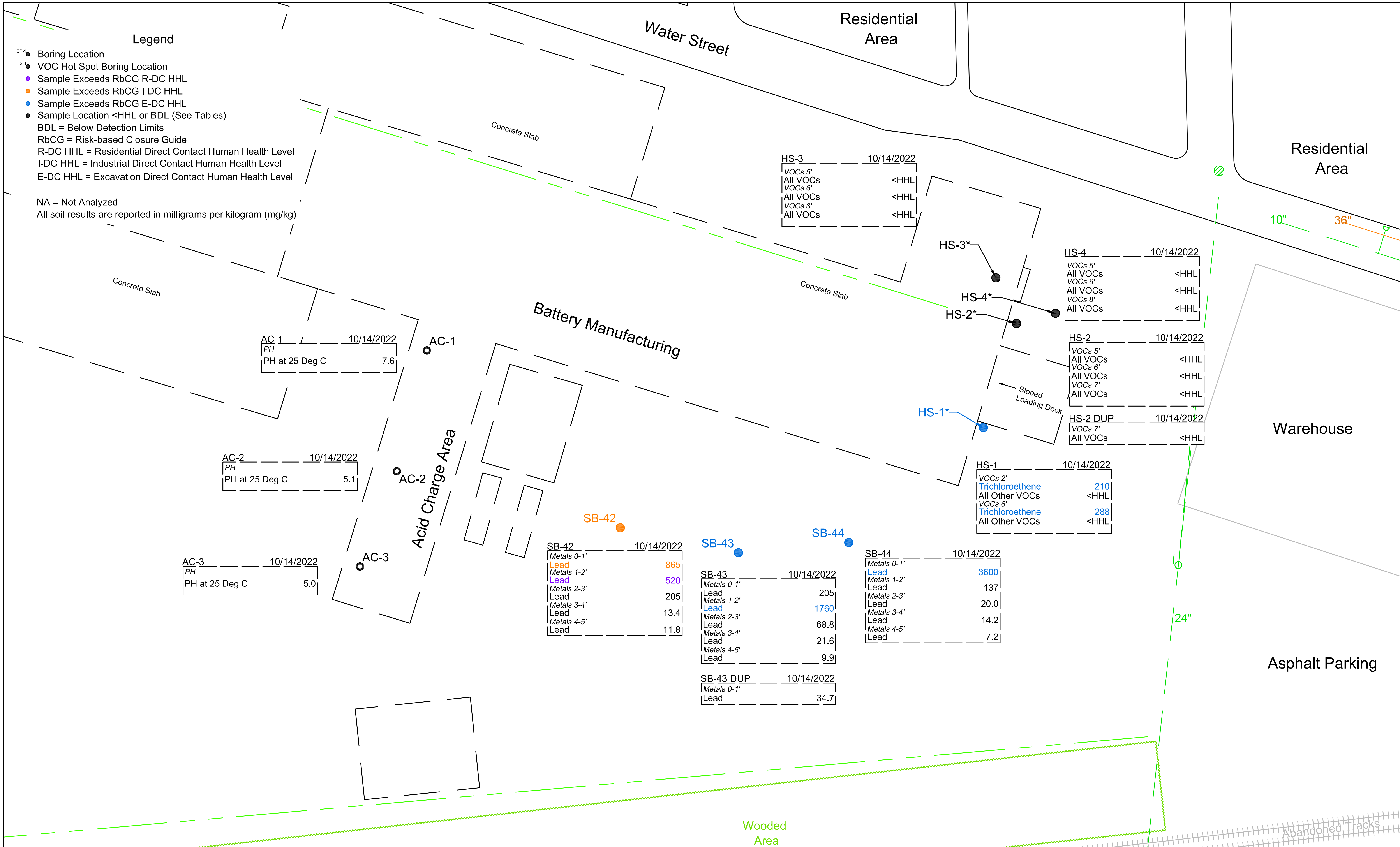
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
INDIANAPOLIS, IN 46256
317-578-4233

DRAWING TITLE: 2018 Aerial Photo

PROJECT LOCATION:
Exide Corporation
303 Water Street
Logansport, Indiana

FIGURE 2


Legend
Soil Boring Location
HS-1* = Location based on Soil Gas Survey Results
Surface Material Sample Location
Previous Soil/Groundwater Location
Water Street
Residential Area
Residential Area
Concrete Slab
Concrete Slab
Concrete Slab
Battery Manufacturing
Acid Charge Area
Sloped Loading Dock
Warehouse
Asphalt Parking
Grassy Area
Wooded Area
Wooded Area
Abandoned Tracks
10"
36"
24"
SB-4
SB-22
SB-5
SB-35
SB-38
SB-36
SB-21
SB-37
SB-40
SB-6
SB-23
SB-24
SB-39
SB-8
SB-7
SB-30
SB-13
SB-25
SB-42
SB-43
SB-44
SB-26
SB-14
SB-28
SB-27
SB-29
AC-1
AC-2
AC-3
CV-1
HS-1*
HS-2*
HS-3*
HS-4*
SGss-1
SGss-2
SGeS-1
SGeS-2
SGeS-3
A-1
A-2
A-3
A-5
B-1
B-2
B-3
B-5
C-1
C-2
C-3
C-4
C-5
C-6
D-1
D-2
D-3
D-4
D-5
D-6
BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233
DATE: 11/02/2022
SCALE: 1" = 60'
DRAWING TITLE
Soil Boring and Soil Gas Sample Locations
PROJECT LOCATION:
Former Exide Corporation
303 Water Street
Logansport, Indiana
DRAWN BY: D Scovel, LPG
BCA PROJ. NO. 22-238J
FIGURE 3



BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
Indianapolis, IN 46256
317-578-4233

DATE:	DRAWING TITLE	PROJECT LOCATION:	DRAWN BY:	FIGURE
11/02/2022	Soil Analytical Results	Former Exide Corporation 303 Water Street Logansport, Indiana	D Scovel, LPG	4
SCALE: 1" = 60'			BCA PROJ. NO. 22-238J	

BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	N	DATE: 11/02/2022 SCALE: 1" = 60'	DRAWING TITLE Soil Gas Survey Analytical Results	PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana	DRAWN BY: D Scovel, LPG BCA PROJ. NO. 22-238J	FIGURE 5

Tables

2nd Supplemental Phase II Environmental Site Assessment
Former Exide Corporation
303 Water Street
Logansport, IN

Table 1
Soil Analytical Results - VOCs

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	Benzene	Carbon disulfide	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene (Cumene)	Methylene Chloride	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	n-Propylbenzene	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	Xylene (Total)	Other VOCs
					CAS Number	71-43-2	75-15-0	67-66-3	75-34-3	75-35-4	156-59-2	156-60-5	100-41-4	98-82-8	75-09-2	90-12-0	91-57-6	91-20-3	103-65-1	127-18-4	108-88-3	71-55-6	79-00-5	79-01-6	95-63-6	108-67-8	75-01-4	1330-20-7	Varies
RbCG Residential Direct Contact Human Health Level[1]					mg/kg	---	---	---	---	---	---	---	---	---	---	**300**	**300**	**30**	---	---	---	---	---	---	---	---	---	---	**Varies**
RbCG Commercial/Industrial Direct Contact Human Health Level[1]					mg/kg	---	---	---	---	---	---	---	---	---	---	**400**	**3000**	**90**	---	---	---	---	---	---	---	---	---	---	**Varies**
RbCG Excavation Direct Contact Human Health Level[1]					mg/kg	**2000**	**700**	**2000**	**2000**	**1000**	**2000**	**2000**	**500**	**300**	**3000**	**400**	**7000**	**3000**	**300**	**200**	**800**	**600**	**30**	**200**	**200**	**200**	**1000**	**300**	**Varies**
RCG Soil Migration to GW Screening Level[2]					mg/kg	**0.051**	**4.8**	**0.44**	**0.16**	**0.05**	**0.41**	**0.62**	**16**	**15**	**0.025**	**1.2**	**3.7**	**0.079**	**25**	**0.045**	**14**	**1.4**	**0.032**	**0.036**	**1.6**	**1.7**	**0.014**	**200**	**Varies**
Exide 22-238	HS-1 2'	50328593001	10/14/2022 10:53	Solid	mg/kg	**0.0026 J**	<0.00048	**0.010**	<0.00052	**0.0045 J**	**1.7**	**0.010**	**0.0067**	**0.0018 J**	<0.016	<0.00041	<0.00043	<0.00043	**0.0038 J**	**11.6**	**0.12**	<0.0024	**6.7**	**210**	**0.015**	**0.0081**	<0.00039	**0.063**	BDL
Exide 22-238	HS-1 6'	50328593002	10/14/2022 10:53	Solid	mg/kg	<0.00051	<0.00063	<0.00051	<0.00069	<0.0044	**2.7**	<0.0026	<0.00072	<0.00031	<0.021	<0.00053	<0.00057	<0.00056	<0.00048	**0.11**	<0.00056	<0.0031	**0.14**	**288**	<0.00047	<0.00054	<0.00051	<0.00052	BDL
Exide 22-238	HS-2 5'	50328593032	10/14/2022 10:15	Solid	mg/kg	<0.00035	**0.0031 J**	<0.00035	**0.012**	<0.0030	<0.0016	<0.0018	<0.00049	<0.00021	<0.014	<0.00036	<0.00039	<0.00038	<0.00032	<0.0020	**0.00045 J**	**0.71**	<0.0011	<0.0023	<0.00032	<0.00037	<0.00035	<0.00035	BDL
Exide 22-238	HS-2 6'	50328593003	10/14/2022 10:15	Solid	mg/kg	<0.00029	<0.00036	**0.00084 J**	**0.020**	**0.0040 J**	<0.0013	<0.0015	<0.00041	<0.00017	<0.012	<0.00030	<0.00032	<0.00032	<0.00027	<0.0017	<0.00032	**0.46**	<0.00090	<0.0019	<0.00027	<0.00031	<0.00029	<0.00030	BDL
Exide 22-238	HS-2 7'	50328593004	10/14/2022 10:15	Solid	mg/kg	<0.00035	<0.00043	**0.0016 J**	**0.021**	**0.0074**	<0.0016	<0.0018	<0.00049	<0.00021	<0.014	<0.00036	<0.00039	<0.00039	<0.00033	<0.0020	<0.00039	**1.5**	<0.0011	<0.0023	<0.00032	<0.00037	<0.00035	<0.00036	BDL
Exide 22-238	HS-2 7' DUP	50328593005	10/14/2022 10:15	Solid	mg/kg	<0.00038	<0.00048	**0.0031 J**	**0.042**	**0.015**	<0.0017	<0.0020	<0.00054	<0.00023	<0.016	<0.00040	<0.00043	<0.00042	<0.00036	<0.0022	<0.00042	**1.1**	<0.0012	<0.0025	<0.00035	<0.00041	<0.00038	<0.00039	BDL
Exide 22-238	HS-3 5'	50328593006	10/14/2022 09:38	Solid	mg/kg	<0.00027	<0.00033	<0.00027	<0.00036	<0.0023	<0.0012	<0.0014	<0.00037	<0.00016	<0.011	<0.00028	<0.00030	<0.00029	<0.00025	<0.0015	<0.00029	**0.0051**	<0.00082	**0.0022 J**	<0.00024	<0.00028	<0.00027	<0.00027	BDL
Exide 22-238	HS-3 6'	50328593007	10/14/2022 09:38	Solid	mg/kg	<0.00050	<0.00062	<0.00050	<0.00067	<0.0043	<0.0022	<0.0026	<0.00070	<0.00030	<0.020	<0.00052	<0.00055	<0.00055	<0.00047	<0.0029	<0.00055	**0.0057 J**	<0.0015	**0.0041 J**	<0.00046	<0.00052	<0.00050	<0.00050	BDL
Exide 22-238	HS-3 8'	50328593008	10/14/2022 09:38	Solid	mg/kg	<0.00035	<0.00043	<0.00035	<0.00047	<0.0030	<0.0016	<0.0018	<0.00049	<0.00021	<0.014	<0.00036	<0.00039	<0.00038	<0.00033	<0.0020	<0.00038	**0.010**	<0.0011	**0.031**	<0.00032	<0.00037	<0.00035	<0.00035	BDL
Exide 22-238	HS-4 5'	50328593031	10/14/2022 09:52	Solid	mg/kg	<0.00039	<0.00048	<0.00039	<0.00052	<0.0033	<0.0017	<0.0020	<0.00054	<0.00023	<0.016	<0.00040	<0.00043	<0.00042	<0.00036	<0.0022	<0.00042	**0.026**	<0.0012	<0.0025	<0.00035	<0.00041	<0.00038	<0.00039	BDL
Exide 22-238	HS-4 6'	50328593033	10/14/2022 09:52	Solid	mg/kg	<0.00035	<0.00043	<0.00035	<0.00047	<0.0030	<0.0016	<0.0018	<0.00049	<0.00021	<0.014	<0.00036	<0.00039	<0.00038	<0.00033	<0.0020	<0.00038	<0.0021	<0.0011	<0.0023	<0.00032	<0.00037	<0.00035	<0.00035	BDL
Exide 22-238	HS-4 8'	50328593010	10/14/2022 09:52	Solid	mg/kg	<0.00036	<0.00044	<0.00036	<0.00048	<0.0031	<0.0016	<0.0019	<0.00050	<0.00021	<0.015	<0.00037	<0.00040	<0.00039	<0.00034	<0.0021	<0.00039	**0.029**	<0.0011	<0.0024	<0.00033	<0.00038	<0.00036	<0.00036	BDL
Exide 22-238	TB	50328593030	10/14/2022 08:00	Solid	mg/kg	<0.00036	<0.00044	<0.00036	<0.00048	<0.0031	<0.0016	<0.0018	<0.00050	<0.00021	<0.015	<0.00037	<0.00040	<0.00039	<0.00033	<0.0021	<0.00039	<0.0022	<0.0011	<0.0024	<0.00033	<0.00038	<0.00036	<0.00036	BDL
Field Duplicate RPD[3]					%	0.0%	0.0%	**63.8%**	**66.7%**	**67.9%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**30.8%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Samples analyzed using EPA SW-846 Method 8260

mg/kg = milligrams per kilogram

VOCs = Volatile Organic Compounds

BDL - Below Detection Limits

[1] Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2022

[2] Remediation Closure Guide, Appendix A, Table A-6: Summary Table - 2022

[3] RPD = relative percent difference =ABS((X-Y)/((X+Y)/2)) --- if both values are below Reporting Limit, then the RPD is considered 0%

+ = Lead Scavangers

Table 2
Soil Analytical Results - Lead

Project ID	Sample ID	Collected Date	Units	Lead
			CAS Number	7439-92-1
RbCG Residential Direct Contact Human Health Level[1]			mg/kg	**400**
RbCG Commercial/Industrial Direct Contact Human Health Level[1]			mg/kg	**800**
RbCG Excavation Direct Contact Human Health Level[1]			mg/kg	**1000**
RCG Soil Migration to GW Screening Level[2]			mg/kg	**270**
Exide 22-238	SB-42 0-1'	10/14/2022 11:42	mg/kg	**865**
Exide 22-238	SB-42 1-2'	10/14/2022 11:42	mg/kg	**520**
Exide 22-238	SB-42 2-3'	10/14/2022 11:42	mg/kg	**205**
Exide 22-238	SB-42 3-4'	10/14/2022 11:42	mg/kg	**13.4**
Exide 22-238	SB-42 4-5'	10/14/2022 11:42	mg/kg	**11.8**
Exide 22-238	SB-43 0-1'	10/14/2022 11:34	mg/kg	**205**
Exide 22-238	SB-43 0-1' DUP	10/14/2022 11:34	mg/kg	**34.7**
Exide 22-238	SB-43 1--2'	10/14/2022 11:34	mg/kg	**1760**
Exide 22-238	SB-43 2-3'	10/14/2022 11:34	mg/kg	**68.8**
Exide 22-238	SB-43 3-4'	10/14/2022 11:34	mg/kg	**21.6**
Exide 22-238	SB-43 4-5'	10/14/2022 11:34	mg/kg	**9.9**
Exide 22-238	SB-44 0-1'	10/14/2022 11:18	mg/kg	**3600**
Exide 22-238	SB-44 1-2'	10/14/2022 11:18	mg/kg	**137**
Exide 22-238	SB-44 2-3'	10/14/2022 11:18	mg/kg	**20.0**
Exide 22-238	SB-44 3-4'	10/14/2022 11:18	mg/kg	**14.2**
Exide 22-238	SB-44 4-5'	10/14/2022 11:18	mg/kg	**7.2**

Field Duplicate RPD (SB-4 0-2' & Dup)[2]	%	**142.1%**

Notes:

Samples alyzed using EPA Method 6010, 6020, 7471, or 7199 (Metals)

mg/kg = milligrams per kilogram

ppm - parts per million

BDL - Below Detection Limits

Blank cells = Not Analyzed

--- No value given in the Risk-based Closure Guide

[1] Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2022

Table 3
Exterior Soil Gas Analytical Results – VOCs

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl chloride	Other VOCs
					CAS Number	71-55-6	156-59-2	127-18-4	79-01-6	75-01-4	
RbCG Residential Exterior Soil Gas Human Health Levels					ug/m3	**50000**	**---**	**400**	**20**	**20**	**Varies**
RbCG Commercial/Industrial Exterior Soil Gas Human Health Levels					ug/m3	**200000**	**---**	**2000**	**90**	**300**	**Varies**
RbCG **Large** Commercial/Industrial Exterior Soil Gas Human Health Levels					ug/m3	**2000000**	**---**	**20000**	**900**	**3000**	**Varies**
Exide 22-238	A-1	0006580-02	09/27/2022	Soil Gas	µg/m³	**0.86**	<0.94	<1.22	**2.87**	<0.62	NA
	A-2	0006580-03	09/27/2022	Soil Gas	µg/m³	**976 E**	<0.94	<1.21	**15.1**	**1.28**	NA
	A-3	0006580-04	09/27/2022	Soil Gas	µg/m³	**843 E**	<0.94	**1.73**	**42**	**0.84**	NA
	A-5	0006580-05	09/27/2022	Soil Gas	µg/m³	**3.2**	**49.5**	**296**	**5,720 E**	**3.14**	NA
	B-1	0006580-06	09/27/2022	Soil Gas	µg/m³	**0.7**	<0.94	<1.22	**18.3**	<0.62	NA
	B-2	0006580-07	09/27/2022	Soil Gas	µg/m³	**260 E**	<0.94	<1.21	**8.11**	**1.2**	NA
	B-3	0006580-08	09/27/2022	Soil Gas	µg/m³	**24.5**	<0.94	**3.75**	**47.9**	<0.61	NA
	B-5	0006580-09	09/27/2022	Soil Gas	µg/m³	**8.84**	<0.93	**6.17**	**299**	<0.61	NA
	C-1	0006580-10	09/27/2022	Soil Gas	µg/m³	**0.52**	<0.94	<1.22	<1.51	<0.62	NA
	C-2	0006580-11	09/27/2022	Soil Gas	µg/m³	**8.48**	<0.94	<1.22	**11.1**	<0.62	NA
	C-3	0006580-12	09/27/2022	Soil Gas	µg/m³	**1.5**	<0.94	**1.96**	**80.4**	<0.61	NA
	C-4	0006580-13	09/27/2022	Soil Gas	µg/m³	**1.05**	<0.94	**1.47**	**5.8**	<0.61	NA
	C-5	0006580-14	09/27/2022	Soil Gas	µg/m³	**0.82**	<0.94	<1.21	<1.50	<0.61	NA
	C-6	0006580-15	09/27/2022	Soil Gas	µg/m³	**0.6**	<0.93	<1.21	<1.50	<0.61	NA
	D-1	0006580-16	09/27/2022	Soil Gas	µg/m³	**0.66**	<0.94	<1.22	<1.51	<0.62	NA
	D-2	0006580-17	09/27/2022	Soil Gas	µg/m³	**0.67**	<0.94	<1.22	<1.51	<0.62	NA
	D-3	0006580-18	09/27/2022	Soil Gas	µg/m³	**1.43**	<0.94	<1.21	**2.93**	<0.61	NA
	D-4	0006580-19	09/27/2022	Soil Gas	µg/m³	**0.83**	<0.94	<1.21	<1.50	<0.61	NA
	D-5	0006580-20	09/27/2022	Soil Gas	µg/m³	**0.98**	<0.93	<1.21	<1.50	<0.61	NA
	D-6	0006580-21	09/27/2022	Soil Gas	µg/m³	**0.52**	<0.93	<1.21	<1.50	<0.61	NA
	SGeS-1	0006580-22	09/27/2022	Soil Gas	µg/m³	<0.47	<0.94	<1.22	<1.51	<0.62	NA
	SGeS-2	0006580-23	09/27/2022	Soil Gas	µg/m³	<0.47	<0.94	<1.21	<1.50	<0.61	NA
	SGeS-3	0006580-24	09/27/2022	Soil Gas	µg/m³	**0.8**	<0.94	<1.21	<1.50	<0.61	NA
	TB	0006580-01	09/27/2022	Air	µg/m³	<0.47	<0.93	<1.21	<1.50	<0.61	NA

Notes:

VOCs = Volatile Organic Compounds

BDL = Below Detection Limits

Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2022

R2 Table 1 is calculated as described in IDEM's Risk-based Closure Guide Chapter 3 and Appendix A assuming a total HQ of 1 and a risk level of 10^{-5}.

Table 4
Sub-Slab Soil Gas and Conduit Vapor
Analytical Results – VOCs

Project ID	Sample ID	Lab ID	Collected Date	Matrix	Units	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl chloride	Other VOCs
	CAS Number					71-55-6	156-59-2	127-18-4	79-01-6	75-01-4	Varies
Residential Sub-Slab Soil Gas Human Health Levels					ug/m3	**200000**	**---**	**1000**	**70**	**60**	**Varies**
Commercial/Industrial Sub-Slab Soil Gas and Sewer Gas Human Health Levels					ug/m3	**700000**	**---**	**6000**	**300**	**900**	**Varies**
LARGE Commercial/Industrial Sub-Slab Soil Gas and Sewer Gas Human Health Levels					ug/m3	**7000000**	**---**	**60000**	**3000**	**9000**	**Varies**
Exide 22-238	SGss-1	0006580-25	09/27/2022	Soil Gas	µg/m³	**299 E**	**2.61**	**30**	**2,600 E**	**2.13**	NA
	SGss-2	0006580-26	09/27/2022	Soil Gas	µg/m³	**1,270 E**	<0.94	<1.22	**27.6**	**2.51**	NA
	CV-1	0006580-27	09/27/2022	Soil Gas	µg/m³	**19.3**	<0.94	**47**	**18**	<0.62	NA
	TB	0006580-01	09/27/2022	Air	µg/m³	<1.21	<0.47	<0.93	<1.50	<0.61	NA

Notes:

VOCs = Volatile Organic Compounds

BDL = Below Detection Limits

Risk-based Closure Guide (R2), Risk Screening Table, Table 1: Human Health Level Table - 2022

R2 Table 1 is calculated as described in IDEM's Risk-based Closure Guide Chapter 3 and Appendix A assuming a total HQ of 1 and a risk level of 10^{-5}.

Appendix H

Passive Soil Gas Testing - Standard for Site Characterization
Rev5

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN

PASSIVE SOIL GAS TESTING:
STANDARD FOR SITE CHARACTERIZATION

Beacon Environmental Services, Inc.
2203A Commerce Road
Suite 1
Forest Hill, MD 21050 USA

Beacon is the recognized leader in passive soil gas and air sampling

DoD ELAP, NELAP, and ISO/IEC 17025 Accredited Laboratory
NEFAP Accredited Field Sampling Organization
Accreditation No. 72690

PASSIVE SOIL GAS TESTING:
STANDARD FOR SITE CHARACTERIZATION

Background and Introduction

Passive soil gas surveys utilize adsorbent samplers that are emplaced subsurface to adsorb volatile and semivolatile organic compounds (VOCs and SVOCs) in soil gas without forcing the flow rate of gas, that can yield a more representative sample than active soil gas methods. Samplers are typically placed in a grid pattern to simultaneously sample trace levels of compounds in soil gas that originate from contamination in soil or groundwater. By sampling all locations at the same time, the temporal variations in soil-gas concentrations that are known to occur daily and even hourly are normalized. In addition, the spatial variability of contamination is better defined with a passive soil gas survey because the lower sampling and analytical costs of the method allow for more locations to be sampled than normally would be with a fixed budget. Passive soil gas (PSG) methods have been demonstrated to be more sensitive and reproducible than active soil gas methods and are able to target a broad range of organic compounds from vinyl chloride to polynuclear aromatic hydrocarbons (PAHs) and other SVOCs.

The analytical results for a passive soil gas method are presented in units of mass (e.g., nanograms of each individual compound) for comparison between sample locations to identify source areas, identify the potential for vapor intrusion, to delineate the lateral extent of contamination, including migration pathways, and to monitor remediation programs. When requested, the mass measured (ng) can be converted to a concentration by dividing the mass (ng) by the sampler uptake rate (ml/min) and the sampling period (min), which is then multiplied by a value of 1,000 to convert ng/ml to ug/m^3. The Beacon PSG Sampler has verified uptake rates when sampling in air for a suite of chlorinated and BTEX compounds. For soil gas sampling, the concentrations reported represent the concentration of the identified compounds under steady state (natural) conditions by passive sampling, as opposed to active sampling with a pump or evacuated canister that may create a momentary vacuum in the soil during the time of sampling. If the soils at the site have low porosity, the formation itself could limit transport of soil gas to the samplers resulting in the reported concentration being biased low. However, the Beacon sampler has a low and controlled uptake rate to limit this bias from occurring.

Passive soil gas (PSG) results are based on a higher level of QA/QC than can be achieved with other field screening methods. Measurements are based on a five-point initial calibration with the lowest point on the calibration curve at or below the practical quantitation limit of each compound. Internal standards and surrogates are included with each analysis – per EPA Method 8260C – to provide proof of performance that the system was operating properly for each sample and to provide consistent reference points for each analysis, which enables an accurate comparison of measured quantities. Trip blanks are analyzed with each batch of samples and because two sets of hydrophobic adsorbent cartridges are provided in each Sampler, duplicate or confirmatory analyses can be performed for any of the sample locations. A representative list of compounds that can be targeted with passive soil gas surveys is provided in **Table 1**.

Table 1
Passive Soil-Gas Survey
Representative List of Target Compounds

TPH C_4-C_9	Chlorobenzene
TPH C_{10}-C_{15}	Ethylbenzene
Vinyl Chloride	p & m-Xylene
1,1-Dichloroethene	Bromoform
Methylene Chloride	1,1,2,2-Tetrachloroethane
1,1,2-Trichlorotrifluoroethane (Freon 113)	o-Xylene
trans-1,2-Dichloroethene	1,2,3-Trichloropropane
Methyl-t-butyl ether (MTBE)	Isopropylbenzene
1,1-Dichloroethane	1,3,5-Trimethylbenzene
cis-1,2-Dichloroethene	1,2,4-Trimethylbenzene
Chloroform	1,3-Dichlorobenzene
2,2-Dichloropropane	1,4-Dichlorobenzene
1,2-Dichloroethane	1,2-Dichlorobenzene
1,1,1-Trichloroethane	n-Butylbenzene
1,1-Dichloropropene	1,2,4-Trichlorobenzene
Carbon Tetrachloride	Naphthalene
Benzene	Hexachlorobutadiene
1,2-Dichloropropane	Trichlorobenzenes
Trichloroethene	2-Methylnaphthalene
1,4-Dioxane	Tetrachlorobenzenes
1,1,2-Trichloroethane	Acenaphthylene
Toluene	Acenaphthene
1,3-Dichloropropane	Pentachlorobenzene
1,2-Dibromoethane (EDB)	Hexachlorobenzene
Tetrachloroethene	Phenanthrene
1,1,1,2-Tetrachloroethane	Anthracene

Note: Additional compounds may be targeted to meet project specific requirements.
The reporting quantitation level (RQL) for each compound is 25 nanograms (ng) and the RQL for TPH is 5,000 ng; however, the demonstrated limit of quantitation (LOQ) for each compound is typically 10 ng.

The following document is broken into two separate parts:

1. General Overview of Passive Soil Gas Investigation for Site Characterization
2. Step-by-Step Passive Soil Gas Sampler Installation and Retrieval

For the complete site characterization, Beacon Environmental recommends a passive soil gas survey be performed followed by a limited and focused soil and/or groundwater sampling program to measure the concentrations of identified compounds. The primary purpose of this document is to describe the methods and procedures used to perform a passive soil gas investigation.

Part 1: General Overview of Passive Soil Gas Investigation for Site Characterization

1.0 Survey Design

The survey design varies depending on the amount of historical and other site information that is available prior to initiating the passive soil gas (PSG) survey. Typically an unbiased grid is established across the site with additional biased sample locations to target specific features. The spacing between sample locations is dependent upon the expected depth of the chemicals of concern (CoC), the soil types, and the size of the area to be investigated. Generally, a grid with 25-foot spacing between sample locations is used to identify source areas, but the actual spacing will be dependent additionally on the size of the area of investigation and the project budget. Wider grids and transects are used to track groundwater contamination. Global positioning system (GPS) equipment can be used to collect the sample location coordinate data.

Beacon Environmental provides a BESURE Sample Collection Kit™ with detailed instructions to allow samples to be collected by an environmental field technician. Following collection in the field, the samplers are returned to Beacon Environmental's laboratory for analysis using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following EPA Method 8260C. A comprehensive survey report is provided by Beacon Environmental that includes results in tabular form as well as on color isopleth maps showing the distribution of compounds identified in the investigation (see **Figure 1** below).

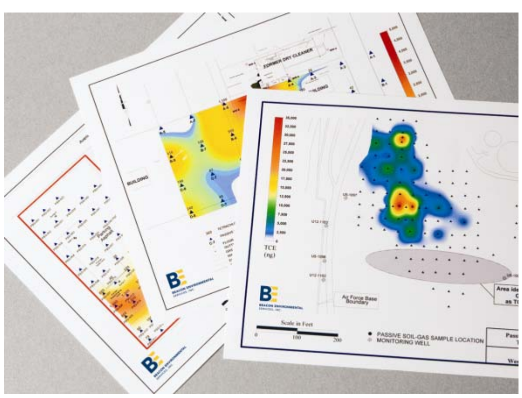


Figure 1 – Example Color Isopleth Maps

2.0 Soil-Gas Sampling Procedures

To perform the soil-gas investigation, Beacon Environmental provides a BESURE Sample Collection Kit™ with all the materials necessary to collect the requested number of soil-gas samples. To collect soil-gas samples, an approximately one-inch diameter hole is advanced to the appropriate depth to meet the objectives of the survey (e.g., one to three feet). The PSG Sampler (which contains two sets of ***hydrophobic adsorbent*** cartridges) is installed in the hole and covered with an aluminum foil plug and soil to seal the sampler in the ground. The adsorbent cartridges used by Beacon Environmental are hydrophobic, which allows the samplers to be effective even in water-saturated conditions. Extensive empirical evidence, which is supported by a government study, has proven that hydrophobic adsorbents work perfectly well in high moisture conditions and should not be encased by a hydrophobic membrane.

For locations covered by asphalt or concrete surfacing, an approximately 1 ½-inch diameter hole is drilled through the surfacing to the underlying soils. A ½” to 1” diameter drill bit can then be used to advance the hole to a three foot depth to increase the sensitivity of the method. The upper 12 inches of the hole is sleeved with a sanitized metal pipe provided in the Kit. After the Sampler is installed inside the metal pipe, the hole is patched with an aluminum foil plug and a thin concrete patch to effectively protect the sampler.

The samplers are exposed to subsurface gas for approximately three to 14 days, with the exact length of time appropriate to meet the objectives of the survey. The sampler is shipped to the site with a length of wire wrapped around the vial and twisted around the shoulder of the vial to expedite retrieval from the ground. Following the exposure period, the Samplers are retrieved and shipped to Beacon Environmental's laboratory for analysis. It is not necessary to use ice or preservatives during shipment; however, the samplers are sealed and shipped under established chain-of-custody procedures. Trip blanks, which remain with the other samples during preparation, shipment, and storage, are included at a typical rate of five percent of the total number of field samples. **Figure 2** shows a PSG Sampler as it looks when received in the BESURE Kit™.

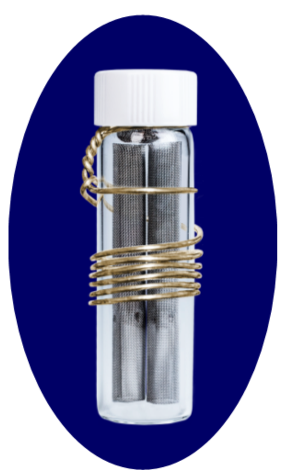


Figure 2 – Beacon PSG Sampler

A two-person team can install approximately 50 to 100 samplers per day depending on the number of sample locations that are covered with asphalt, concrete, or gravel surfacing. For retrieval of the Samplers, one person can retrieve approximately 50 samplers per day and patch the holes through the surfacing. **Figure 3** shows installation through asphalt and grass surfaces, respectively.

Figure 3 — Installation of Samplers with Beacon Environmental's BESURE Kit™

The amount of days required to complete the installation and retrieval procedures is dependent upon the number of personnel deployed for the execution of the fieldwork, weather conditions, and health and safety considerations.

3.0 Analytical Procedures

A chain-of-custody accompanies the field samples at all times from the time the samples are collected until final analysis. BESURE Kits™ are shipped with tug-tight custody seals to ensure that samplers are not tampered with during transport (see **Figure 4**). Once samples are received at the laboratory, the sample custodian receives the samples and logs the samples into the laboratory's Sample Receipt Log.

Figure 4 – BESURE Sample Collection Kit™

Beacon Environmental's laboratory is maintained in a safe and secure manner at all times. The facility is locked when not occupied and is monitored for fire and unauthorized access. Beacon Environmental personnel escort all visitors at all times while inside the facility. Neither soil nor water analyses are performed at Beacon Environmental, so no solvents are stored or used that can create background contamination problems as experienced by wet labs. This ensures that a clean laboratory environment is maintained for trace analyses.

Soil gas samples are analyzed by Beacon Environmental using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation, following EPA Method 8260C procedures. Samples are routinely analyzed for a list of approximately 40 compounds, which can additionally include total petroleum hydrocarbons (TPH). Results are based on an ***initial five-point calibration***. In addition, a BFB tune is performed daily and a method blank is run following the daily calibration verifications. ***Internal standards and surrogates*** are included with each sample analysis. The laboratory's reported quantitation level (RQL) for each of the targeted compounds is 10 or 25 nanograms (ng); however, the limit of quantitation (LOQ) is 10 ng and the limit of detection (LOD) is 5 ng. MDL studies are performed, as well. As an option, tentatively identified compounds (TICs) can be reported for each sample, with the results based on the closest internal standard to the TIC.

Beacon Environmental is known for providing the highest level of accuracy and quality assurance and quality control (QA/QC) procedures for the analysis of soil gas samples in the industry. The table below summarizes these analytical procedures.

Description	**Included**
Analysis by thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) following EPA Method 8260C - Accredited	√
Analytical results based on 5-point initial calibration	√
MDLs are based on a seven replicate study with contiguous analyses	√
Limit of Detection (LOD) and Limit of Quantitation (LOQ) studies performed quarterly	√
Internal standards and surrogates included with each run	√
BFB tunes (5 to 50 nanograms through GC, per method)	√
Continuing calibration checks and method blanks	√

Analyses of the samples are performed at Beacon Environmental's laboratory using state-of-the-art instruments that are listed below. The Markes thermal desorption instruments outperform other older thermal desorption equipment, which cannot target as broad a range of compounds with as much sensitivity or accuracy.

- Agilent 7890 Gas Chromatograph / 5975 Mass Spectrometer,
- Markes UltrA autosampler and Unity thermal desorber,
- Markes TD100 and TD100xr, and
- Markes Mass Flow Controller Module.

4.0 Reporting

Following analysis and a thorough data review, a comprehensive survey report is provided that contains:

project objectives,
the investigation plan,
the QA/QC program and findings,
laboratory data,
color isopleth maps showing the distribution of detected compounds,
field procedures,
laboratory procedures,
Field Deployment Reports, and
Chain-of-Custody documentation.

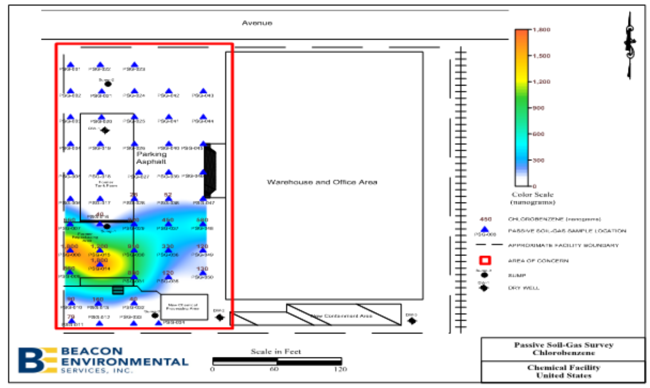


Figure 5 – Example Color Isopleth Map

Beacon Environmental requests a CAD drawing of the site is provided with coordinate data for each location to facilitate creation of color isopleth maps. BEACON can provide the color isopleth maps as layers for use with CAD software or provide data files of the contours for use with GIS software. Beacon Environmental provides post survey support to assist in interpreting the data, when requested.

Biography of Author

Harry O'Neill is the President of Beacon Environmental Services and has managed soil gas and vapor intrusion investigations for more than 25 years, working on federal, state, and commercial projects throughout the United States, as well as internationally across six continents. Under his direction since 1999, Beacon Environmental has achieved DoD ELAP, NELAP, and ISO/IEC 17025 accreditation for the analysis of soil gas and air samples to target trace concentrations of organics using sorbent samplers. In addition, Mr. O'Neill oversaw the implementation of the quality program that enabled Beacon to become the first National Environmental Field Activities Program (NEFAP) accredited field sampling and measurement organization (FSMO) in the United States, and the company's accreditation is for the collection of soil gas and air samples. Mr. O'Neill has been on the forefront of the acceptance of passive sampling technologies at the national and international level and has managed the implementation of thousands of soil gas and air sampling surveys. He is a member of AWMA, ITRC, and ASTM, and is the lead author of ASTM Standard D7758: *Standard Practice for Passive Soil Gas Sampling in the Vadose Zone* and has published and presented findings throughout the United States, as well as internationally across four continents as an invited speaker. Mr. O'Neill can be contacted at Harry.ONeill@Beacon-usa.com or by phone at 1-410-838-8780.

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Part 2: PSG Sampler Step-by-Step Installation and Retrieval Procedures

PSG Sampler Installation

1. At each survey point, clear vegetation as necessary and, using a hammer drill and drill bit (or comparable equipment), create a 1”- to 1½”-diameter hole approximately 12 inches deep, but can be as shallow as 6 inches. When appropriate, use a ½” to 1” diameter drill bit to extend the hole to a three foot depth. Note: In areas of very organic topsoil or landscaped areas (*i.e.*, mulched areas, gardens, etc.) it is important to get beneath the organic soil layer to the underlying soil below. For locations covered with asphalt or concrete, an approximately 1½”-diameter hole is drilled through the surfacing to the underlying soils and the hole is sleeved with a 12” long pre-cleaned, aluminum pipe provided in the BeSure Sample Collection Kit. The pipe is then pushed or tapped ½” to 1” into the base of the hole using a hammer and tapping dowel also provided in the Kit.

2. After the hole is created, remove a Beacon PSG Sampler (a rugged, borosilicate glass vial containing two sets of ***hydrophobic adsorbent cartridges***) and unwind the retrieval wire wrapped around it. Holding the capped end of the vial in one hand, pull the wire tight (to straighten it) with the other hand. Remove the solid cap on the Sampler Vial and replace it with a Sampling Cap (a one-hole cap with a screen meshing insert). Store the solid cap in the Cap Storage Container.

3. Lower the Sampler with the screened-capped-end pointing down into the hole. If the hole was created to a greater depth it is only necessary to suspend the sampler in the upper portion of the hole because compounds in soil gas that enter the hole will migrate up to the sampler. With the retrieval wire extending from the hole, plug the top of the hole with aluminum foil and use a hammer to collapse the soils above the foil plug. Coil the wire and lay it flat on the ground surface. For those locations through concrete or asphalt, lower the Sampler into the aluminum pipe and bend the end of the wire over the top of the pipe so that the coil of wire hangs over the top and outside the pipe. Next, plug the top of the hole with a wad of aluminum foil and a thin concrete patch (approximately ¼” thick) to effectively seal the Sampler in the ground. **Figure 6** depicts sampler installation options.

4. Close the Kit, and on the Chain of Custody record: (a) sample-point number; (b) date and time of emplacement; and (c) other relevant information (*e.g.*, soil type, vegetation, proximity to potential source areas). Be sure to mark the sample location and take detailed notes (*i.e.*, compass bearings and distances from fixed reference points or GPS coordinates).

5. Move to next location.

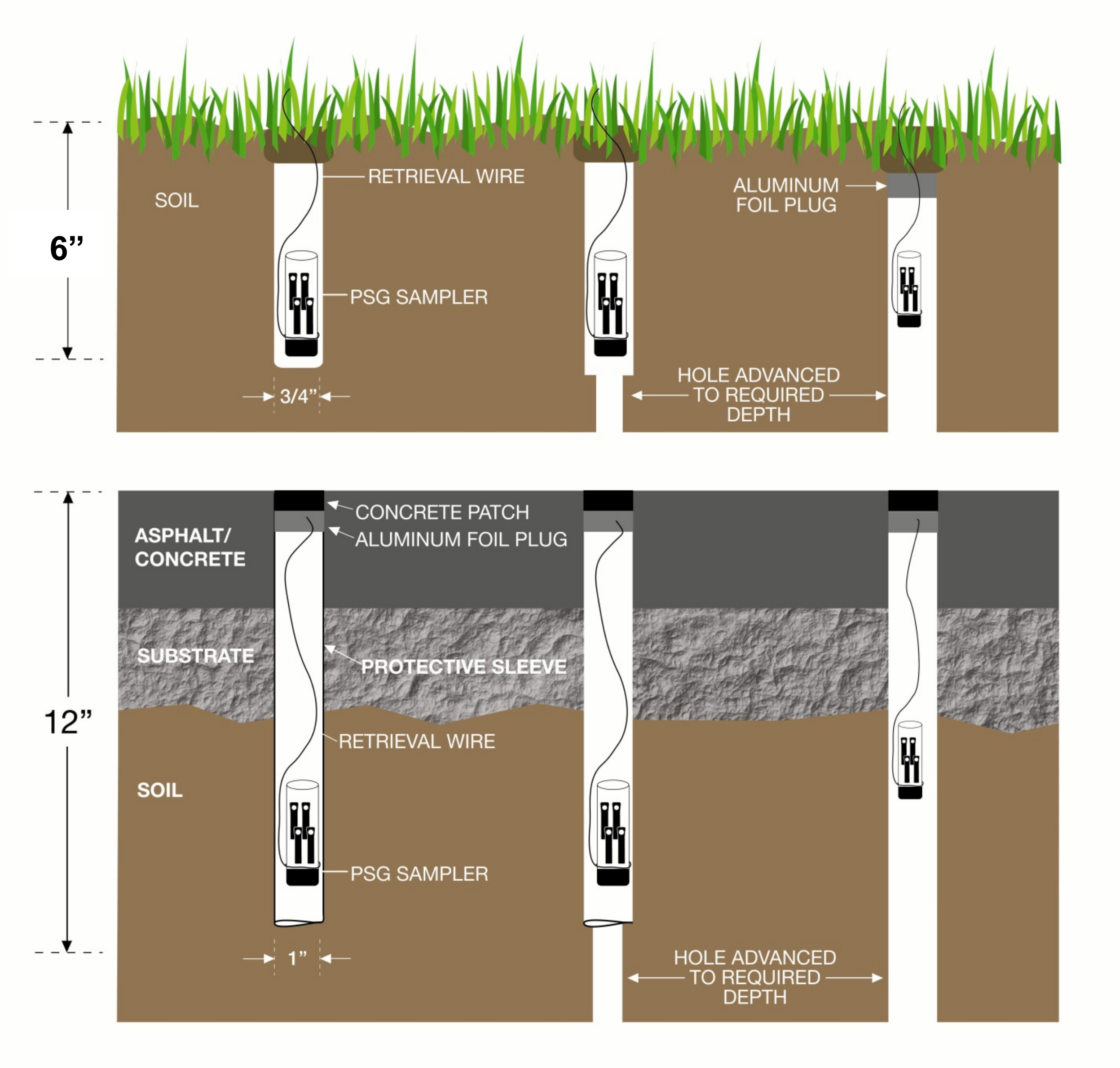

Figure 6 – Sampler Installation Options

PSG Sampler Retrieval

1. At each sample location open the BeSure Sample Collection Kit and place it and the wire cutters within easy reach. Remove a square of gauze cloth and place it and a clean towel on the open Kit. Remove a solid cap from the Cap Storage Container and place it on the Kit, also.

2. Expose the Sampler by pulling on the wire when in soils or using a small chisel and hammer to chip the thin concrete patch away when in asphalt/concrete. Retrieve the Sampler from its hole by pulling on the retrieval wire. Holding the Sampler upright, clean the sides of the vial with the clean towel (especially close to the Sampling Cap). Remove the Sampling Cap, cut the wire from the vial with the wire cutters, and clean the vial threads completely with the gauze cloth.

3. Firmly screw the solid cap on the Sampler Vial and with a ballpoint pen record the sample number, corresponding to the sample location, on the cap's label.

4. On the Field Deployment Report, record: (a) date and time of retrieval (to nearest minute); and (b) any other relevant information.

5. Return the sampling cap to the Sampling Cap container. Place the sealed and labeled Sampler Vial in a 3" x 4" re-sealable Sampler Bag. Then place the individually bagged and labeled sampler into the larger bag labeled "Return Shipment Bag." Each sampler is to be individually bagged and placed in a Return Shipment Bag, with at least one trip blank per Return Shipment Bag included with the PSG Samplers.

6. On the Chain of Custody, record: (a) date and time of retrieval; and (b) any other relevant information. After all samples have been retrieved, verify that the caps on each Sampler are sealed tightly and that the seals on the Sampler Bags are closed. Verify that all Samplers are stored in the Return Shipment Bag, which contains an adsorbent pack. Seal the Return Shipment Bag and place it in the upper tray of the Kit, and place the provided tools and materials in the lower compartment of the Kit.

7. Complete the chain-of-custody for shipment of Samplers. Seal the BESURE Sample Collection Kit with the provided tug tight custody seal, provided in the Kit, which has a unique identification number that is documented on the chain-of-custody. Place the Kit and paperwork in a cardboard box and ship via overnight delivery to Beacon Environmental Services for analysis of the samples.

Appendix I

Soil Gas Map Report

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

Beacon Environmental
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
1.410.838.8780

CERTIFICATE OF ANALYSIS

Beacon Proposal No.: 220830R04

Beacon Project No.: 0006580

Project Description:

Project Site: Former Exide Corporation
Logansport, IN

Prepared for:
David Scovel
BCA Consultants, Inc.
7202 E 87th Street, Suite 110
Indianapolis, IN 46256

Ryan W. Schneider
Senior Project Manager

October 14, 2022

All data meet requirements as specified in the Beacon Environmental Services, Inc. Quality Assurance Project Plan and the results relate only to the samples reported. The work performed was in accordance with ISO/IEC 17025:2017 requirements, except samples were analyzed within a 24-hour tune window. This report shall not be reproduced, except in full, without written approval of the laboratory. Release of the data contained in this data package has been authorized by the Laboratory Director or his signee, as verified by the following signatures:

Steven C. Thornley
Laboratory Director

Peter B. Kelly
Quality Manager

BEACON ENVIRONMENTAL

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Forest Hill, MD 21050 USA
1.410.838.8780

Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Summary of Compound Detections- Mass

Lab Sample ID: 0006580-02 — **A-1** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**18**		10	C22092911.D
Trichloroethene	79-01-6	**19**		10	C22092911.D

Lab Sample ID: 0006580-03 — **A-2** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Vinyl Chloride	75-01-4	**21**		10	C22092912.D
1,1,1-Trichloroethane	71-55-6	**20,600**		10	C22092912.D
Trichloroethene	79-01-6	**100**		10	C22092912.D

Lab Sample ID: 0006580-04 — **A-3** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Vinyl Chloride	75-01-4	**14**		10	C22092913.D
1,1,1-Trichloroethane	71-55-6	**17,800**		10	C22092913.D
Trichloroethene	79-01-6	**278**		10	C22092913.D
Tetrachloroethene	127-18-4	**14**		10	C22092913.D

Lab Sample ID: 0006580-05 — **A-5** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Vinyl Chloride	75-01-4	**51**		10	C22092914.D
cis-1,2-Dichloroethene	156-59-2	**531**		10	C22092914.D
1,1,1-Trichloroethane	71-55-6	**68**		10	C22092914.D
Trichloroethene	79-01-6	**38,200**		10	C22092914.D
Tetrachloroethene	127-18-4	**2,450**		10	C22092914.D

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Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Summary of Compound Detections- Mass

Lab Sample ID: 0006580-06 — **B-1** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**15**		10	C22092915.D
Trichloroethene	79-01-6	**121**		10	C22092915.D

Lab Sample ID: 0006580-07 — **B-2** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Vinyl Chloride	75-01-4	**19**		10	C22092916.D
1,1,1-Trichloroethane	71-55-6	**5,480**		10	C22092916.D
Trichloroethene	79-01-6	**54**		10	C22092916.D

Lab Sample ID: 0006580-08 — **B-3** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**517**		10	C22092917.D
Trichloroethene	79-01-6	**318**		10	C22092917.D
Tetrachloroethene	127-18-4	**31**		10	C22092917.D

Lab Sample ID: 0006580-09 — **B-5** Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**188**		10	C22092918.D
Trichloroethene	79-01-6	**2,000**		10	C22092918.D
Tetrachloroethene	127-18-4	**51**		10	C22092918.D

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Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Summary of Compound Detections- Mass

Lab Sample ID: 0006580-10 | **C-1** Soil Gas | Method: EPA 8260C

Analyte	**CAS#**	**Result (ng)**	**Q**	**LOQ (ng)**	**File ID**
1,1,1-Trichloroethane	71-55-6	**11**		10	C22092919.D

Lab Sample ID: 0006580-11 | **C-2** Soil Gas | Method: EPA 8260C

Analyte	**CAS#**	**Result (ng)**	**Q**	**LOQ (ng)**	**File ID**
1,1,1-Trichloroethane	71-55-6	**179**		10	C22092920.D
Trichloroethene	79-01-6	**74**		10	C22092920.D

Lab Sample ID: 0006580-12 | **C-3** Soil Gas | Method: EPA 8260C

Analyte	**CAS#**	**Result (ng)**	**Q**	**LOQ (ng)**	**File ID**
1,1,1-Trichloroethane	71-55-6	**32**		10	C22092921.D
Trichloroethene	79-01-6	**534**		10	C22092921.D
Tetrachloroethene	127-18-4	**16**		10	C22092921.D

Lab Sample ID: 0006580-13 | **C-4** Soil Gas | Method: EPA 8260C

Analyte	**CAS#**	**Result (ng)**	**Q**	**LOQ (ng)**	**File ID**
1,1,1-Trichloroethane	71-55-6	**22**		10	C22092922.D
Trichloroethene	79-01-6	**39**		10	C22092922.D
Tetrachloroethene	127-18-4	**12**		10	C22092922.D

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Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Summary of Compound Detections- Mass

Lab Sample ID: 0006580-14 | **C-5** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**17**		10	C22092923.D

Lab Sample ID: 0006580-15 | **C-6** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**13**		10	C22092924.D

Lab Sample ID: 0006580-16 | **D-1** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**14**		10	C22092925.D

Lab Sample ID: 0006580-17 | **D-2** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**14**		10	C22092926.D

Lab Sample ID: 0006580-18 | **D-3** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**30**		10	C22092927.D
Trichloroethene	79-01-6	**19**		10	C22092927.D

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Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Summary of Compound Detections- Mass

Lab Sample ID: 0006580-19 — **D-4** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**18**		10	C22092928.D

Lab Sample ID: 0006580-20 — **D-5** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**21**		10	C22092929.D

Lab Sample ID: 0006580-21 — **D-6** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**11**		10	C22092930.D

Lab Sample ID: 0006580-24 — **SGeS-3** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**17**		10	C22092933.D

Lab Sample ID: 0006580-25 — **SGss-1** — Soil Gas — Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Vinyl Chloride	75-01-4	**35**		10	C22092934.D
cis-1,2-Dichloroethene	156-59-2	**28**		10	C22092934.D
1,1,1-Trichloroethane	71-55-6	**6,300**		10	C22092934.D
Trichloroethene	79-01-6	**17,200**		10	C22092934.D
Tetrachloroethene	127-18-4	**247**		10	C22092934.D

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Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Summary of Compound Detections- Mass

Lab Sample ID: 0006580-26 | **SGss-2** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
Vinyl Chloride	75-01-4	**41**		10	C22092935.D
1,1,1-Trichloroethane	71-55-6	**26,800**		10	C22092935.D
Trichloroethene	79-01-6	**183**		10	C22092935.D

Lab Sample ID: 0006580-27 | **CV-1** Soil Gas | Method: EPA 8260C

Analyte	CAS#	Result (ng)	Q	LOQ (ng)	File ID
1,1,1-Trichloroethane	71-55-6	**407**		10	C22092936.D
Trichloroethene	79-01-6	**119**		10	C22092936.D
Tetrachloroethene	127-18-4	**386**		10	C22092936.D

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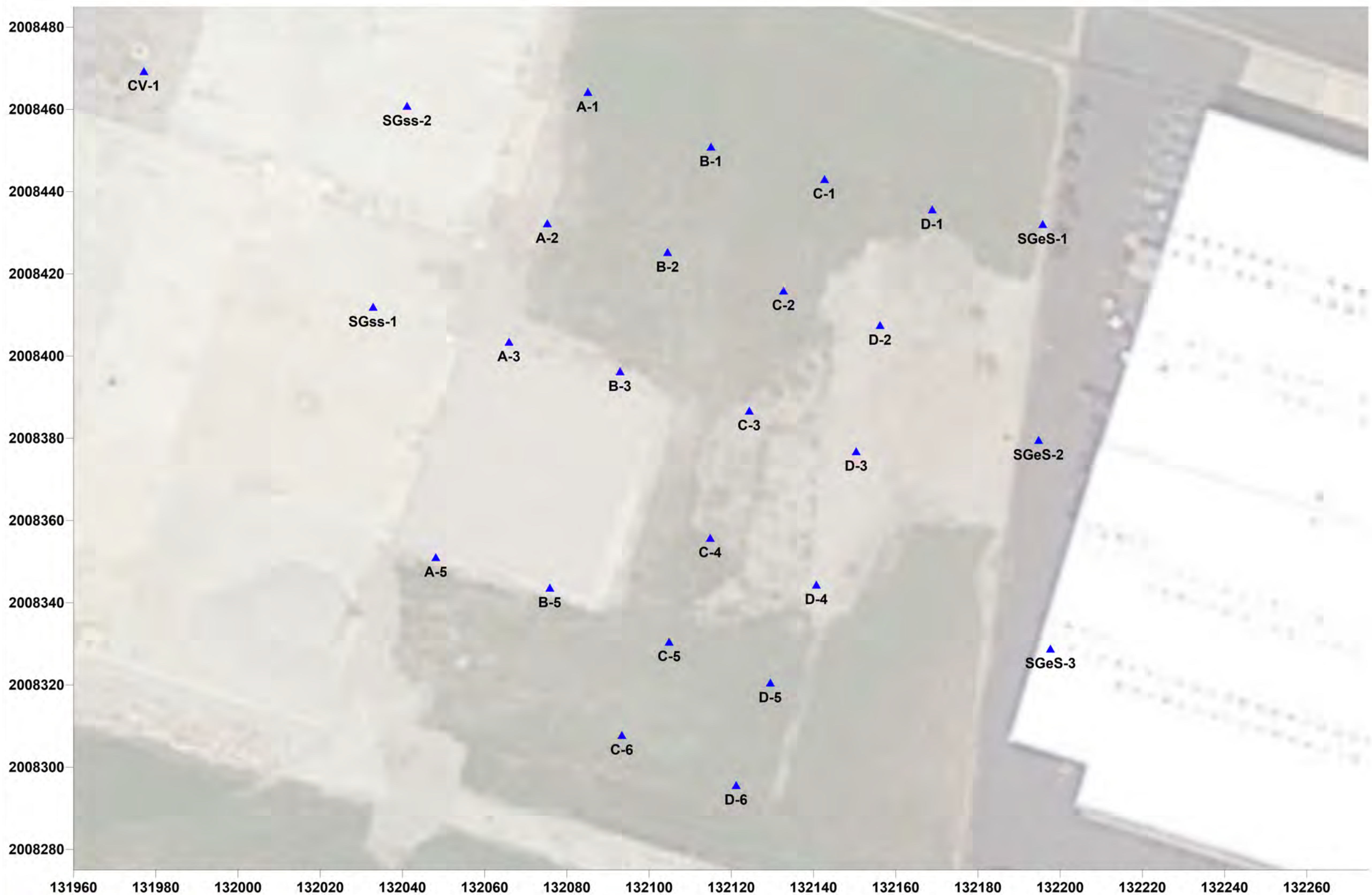
Map Report

BCA Consultants, Inc.	**Project Site:** Former Exide Corporation	**Beacon Proposal:** 220830R04
7202 E 87th Street, Suite 110	**Project Location:** Logansport, IN	**Beacon Project No.:** 0006580
Indianapolis, IN 46256	**Project Manager:** David Scovel	**Reported:** 10/14/2022

Map Data Summary Table

Sample locations are shown on **Figure 1**. The following table lists number of detections on field samples from the current survey, the reporting limit, and the maximum value for each mapped compound. The table also includes the transformation and interpolation method for the compound distribution maps provided.

Figure No.	Compound	Number of Detections	LOQ (ng)	Max Value (ng)	Transformation Method	Interpolation Method
2	1,1,1-Trichloroethane	24	10	26,800	Log	Kriging
3	Trichloroethene	15	10	38,200	Log	Kriging
4	Tetrachloroethene	8	10	2,450	Log	Kriging



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Beacon Project No. 6580, September 2022

LEGEND

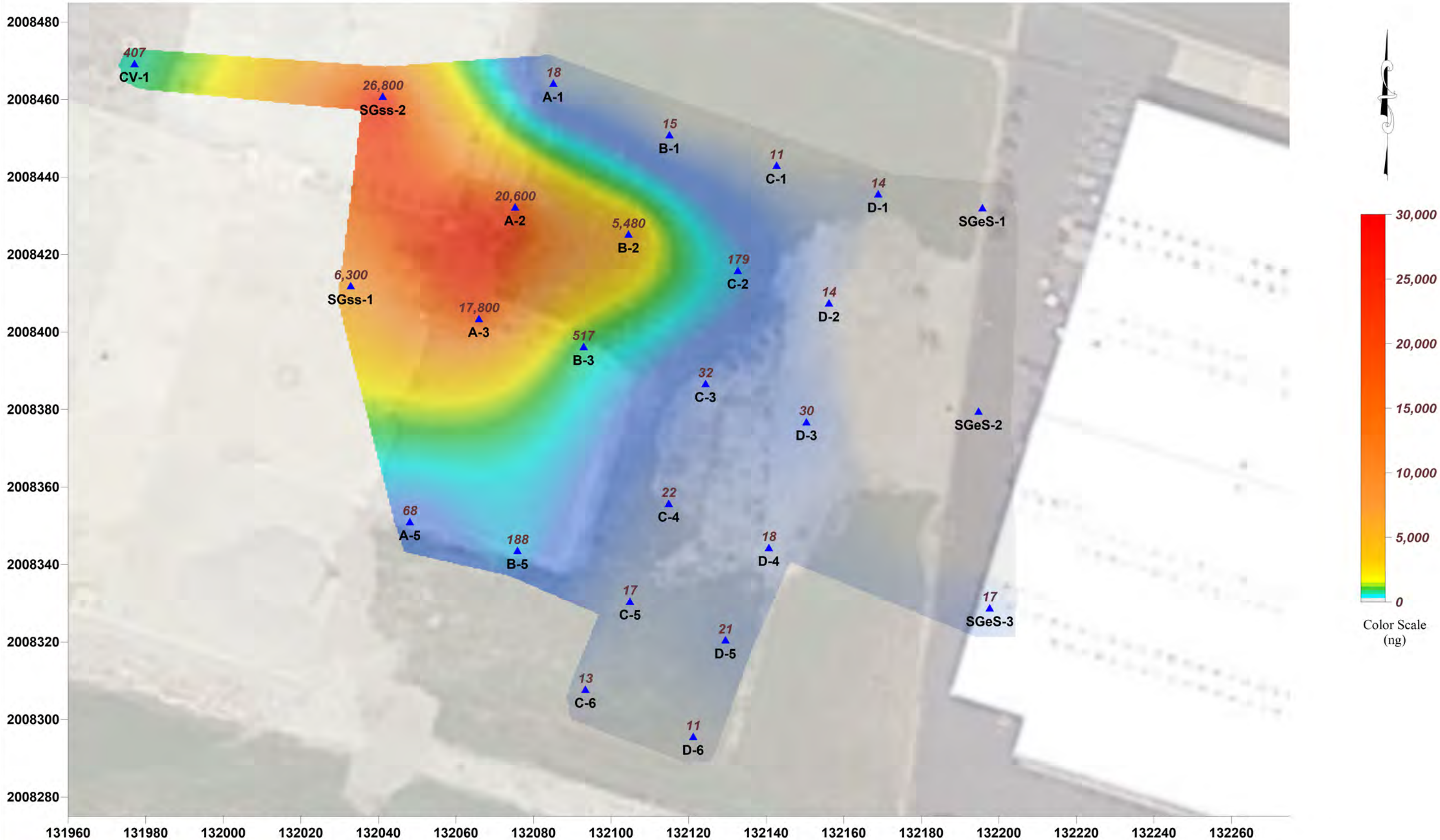
▲ PASSIVE SOIL-GAS SAMPLE LOCATION

Scale in Feet
0 25 50

System:	State Plane
Zone:	Indiana East (EPSG:6459)
Datum:	NAD83(2011)
Coordinate Units:	Feet

Figure 1
Passive Soil-Gas Survey Sample Locations

Former Exide Corporation
Logansport, IN



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LEGEND

1,000 NANOGRAMS/SAMPLER

▲ PASSIVE SOIL-GAS SAMPLE LOCATION

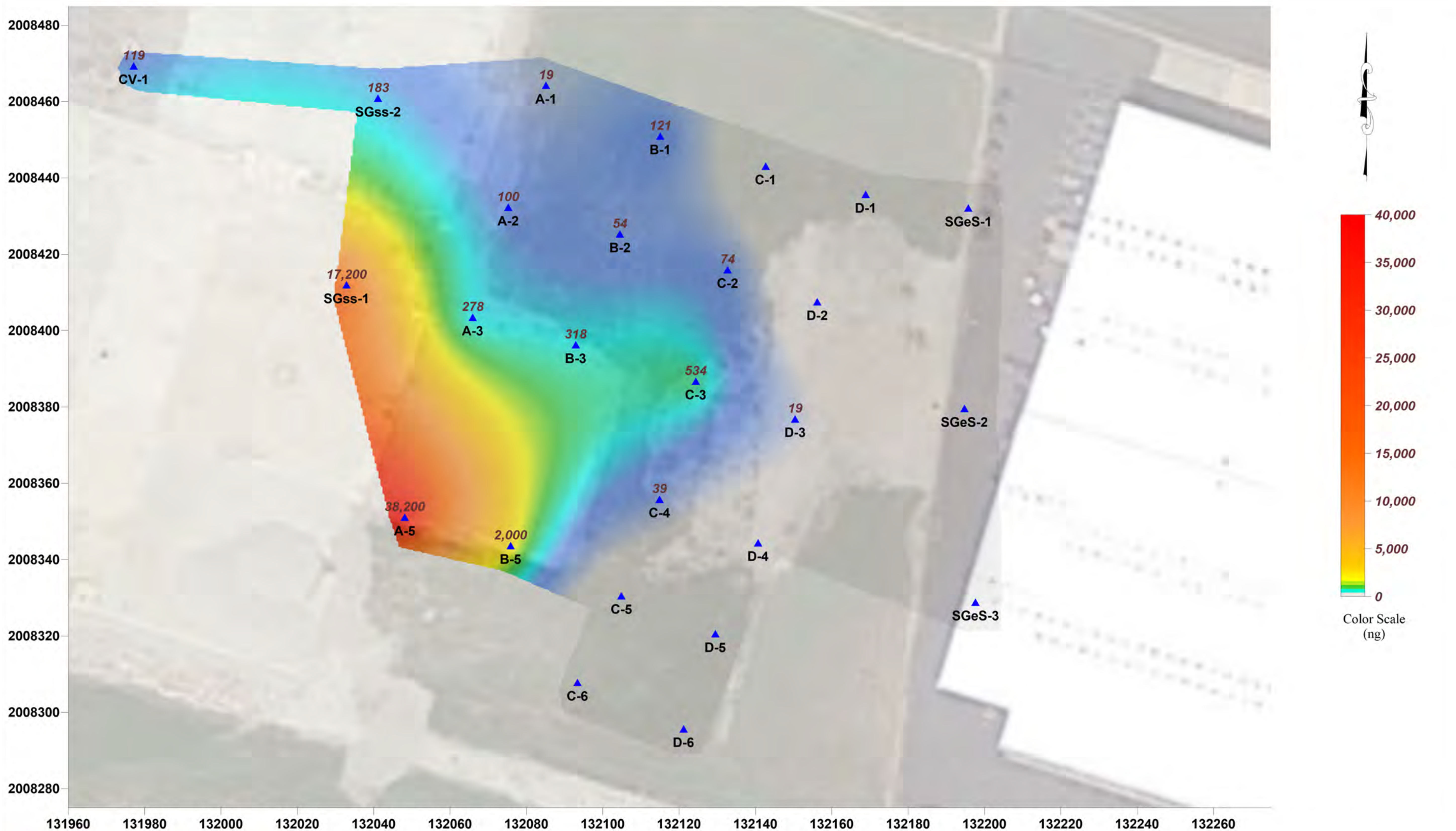
Scale in Feet

0 25 50

System:	State Plane
Zone:	Indiana East (EPSG:6459)
Datum:	NAD83(2011)
Coordinate Units:	Feet

Figure 2
Passive Soil-Gas Survey
1,1,1-Trichloroethane

Former Exide Corporation
Logansport, IN



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Beacon Project No. 6580, September 2022

LEGEND

1,000 NANOGRAMS/SAMPLER

▲ PASSIVE SOIL-GAS SAMPLE LOCATION

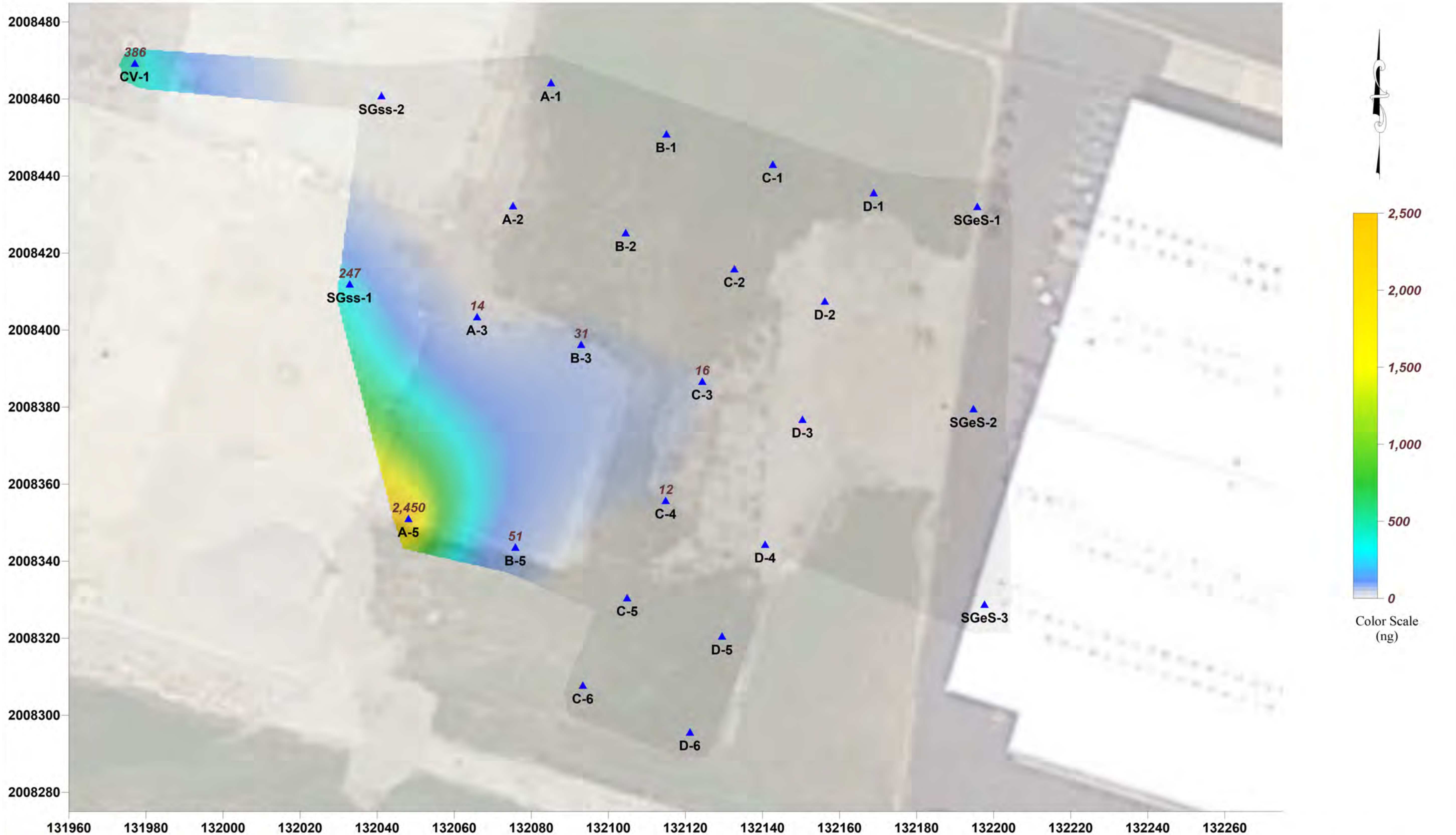
Scale in Feet

0 25 50

System:	State Plane
Zone:	Indiana East (EPSG:6459)
Datum:	NAD83(2011)
Coordinate Units:	Feet

Figure 3
Passive Soil-Gas Survey
Trichloroethene

Former Exide Corporation
Logansport, IN



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Beacon Project No. 6580, September 2022

LEGEND

1,000 NANOGRAMS/SAMPLER

▲ PASSIVE SOIL-GAS SAMPLE LOCATION

Scale in Feet

0 25 50

System:	State Plane
Zone:	Indiana East (EPSG:6459)
Datum:	NAD83(2011)
Coordinate Units:	Feet

Figure 4
Passive Soil-Gas Survey
Tetrachloroethene

Former Exide Corporation
Logansport, IN

Appendix J

Site Health and Safety Plan

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

SITE HEALTH AND SAFETY PLAN
Former Exide Site Work Plan
303 Water Street, Logansport Indiana

1.0 GENERAL PROJECT INFORMATION

Prime Contractor:	BCA Environmental Consultants, LLC
Client:	City of Logansport
Subject Site Name:	Former Exide Site
Site Address:	303 Water Street, Logansport IN
Principal: Project Managers:	John Kilmer David Scovel, LPG
Date of Plan:	December 5, 2022

SITE DESCRIPTION

Type of Facility (describe):	Former Battery Factory
Active or Closed/Abandoned:	Subject Site is closed/vacant
Describe surface features (buildings, paved or unpaved, overhead / underground utilities):	All buildings demolished, concrete slab and asphalt lot remaining.
List any site access restrictions:	Authorized Personnel only
Surrounding neighborhood description:	Residential / Commercial

SITE ACTIVITIES - The site activities covered by this HASP include those checked in the box below:

Site Activity	Soil Excavation / Disposal	In-situ chemical injections	Soil probes and soil sampling	Monitoring Well installation	Groundwater sampling
Assessment					
Investigation					
Remediation	X	X	X	X	X

EMERGENCY PHONE NUMBERS

POSITION	NAME	CONTACT
Safety Officer	David Scovel, L.P.G.	© (317) 605-1398
Field Technician	TBD	©
Field Technician	TBD	©
Industrial Services	NA	NA
Subcontractors: List all names of subcontractors to be used for site activities	TBD	©
Hospital Name	Logansport Memorial Hospital	
Hospital Address	1101 Michigan Ave Logansport, IN	
Hospital Phone Number	(574) 753-7541	
Directions to nearest Hospital	See attached map	
Fire and Emergency	Call 911	
EPA Hotline:	1-800- 621-3191	

2.0. INTRODUCTION/SCOPE OF WORK

This plan provides health and safety guidelines for site investigation and remediation activities conducted by BCA Environmental Consultants, LLC (BCA) to protect on-site personnel, visitors and the public from physical harm and exposure to hazardous materials and/or wastes. The procedures and guidelines contained herein are based on the best available information at the time of the plan's preparation. Specific requirements may be revised if new information is received, or site conditions change. It is the responsibility of the field personnel to evaluate the site work conditions and if in doubt about safety or an operation, request assistance from the Site Safety Officer. Compliance with this plan is mandatory for all on-site BCA personnel and subcontractors.

Operations at the site may require additional tasks not identified in the preparation of this health and safety plan (HASP). Before performing any task not covered in this HASP a revision must be prepared and approved by the Site Safety Officer (SSO).

2.1 Scope of Work

Scope of work for sub-surface investigation at the site includes:

- Soil excavation and remediation
- Soil probes and soil sampling
- Monitoring well installation
- Groundwater sampling

3.0 PERSONNEL CONTACT INFORMATION AND PHONE NUMBERS

The BCA SSO will have the authority to alter work practices, stop work, and/or allocate resources to mitigate unsafe work practices. All personnel have the authority to stop any work practice that may endanger site personnel or the general public. Restarting work will be done in consultation with the SSO. The following personnel and subcontractor resources will be used on this site:

POSITION	NAME	CONTACT
Safety Officer	**David Scovel, L.P.G.**	**© (317) 605-1398**
Field Technician	**TBD**	**©**
Field Technician	**TBD**	**©**
Excavation Services	**To be determined**	**To be determined**
Industrial Services	**To be determined**	**To be determined**
Subcontractors: List all names of subcontractors to be used for site activities	**TBD**	**©**

TABLE OF AUTHORITY

Principal Manager
John Kilmer
Responsibilities
Accident Reporting
Restart Work Following Work Stoppage
OSHA and USEPA Point of Contact

Site Safety Officer
David Scovel, L.P.G.
Responsibilities
Air Monitoring/PPE Upgrade Determination
Incident Investigation Documentation
"Tailgate" HASP Meetings
Decision to Involve Police, Fire and Ambulance
Enforcing PPE Use, Observing Compliance with HASP Provisions

BCA Field Personnel
David Scovel, L.P.G.
TBD
Responsibilities
Assure Compliance with HASP
Observe/Report Unanticipated Conditions
Stop Work/Report to Supervisors if Unanticipated Conditions Exist

Subcontractor Supervisors
TBD
Responsibilities
Assure Personnel Compliance with HASP
Observe/Report Unanticipated Conditions

Subcontractor Personnel
TBD
Responsibilities
Assure Personnel Compliance with HASP
Observe/Report Unanticipated Conditions
Stop Work/Report to Supervisors if Unanticipated Conditions Exist

4.0 EMERGENCY INFORMATION/RESPONSE

The purpose of this section is to provide the on-site user with contact and location information to be used in case of an emergency response situation. In case of an emergency on-site, **CALL 911** first and **NOTIFY** the site operator (if available). Then contact the BCA project manager and Site Safety Officer for this site.

EMERGENCY PHONE NUMBERS

Hospital Name	Logansport Memorial Hospital
1101 Michigan Ave, Logansport, IN	1101 Michigan Ave, Logansport, IN
(574) 753-7541	(574) 753-7541
Directions to nearest Hospital	See attached map
Fire and Emergency	Call 911
EPA Hotline:	1-800- 621-3191
National Response Center	1-800-424-8802
TSCA HOTLINE	1-800-424-9065
Poison Control Center	1-800-382-9097
CHEMTREC	1-800-424-9300
National Pesticide Center	1-800-858-7378

5.0 STANDARD EMERGENCY PROCEDURES

5.1 Hazard Communication

Any organization wishing to bring any hazardous material onto any BCA-controlled work site must first provide a copy of the item's Material Safety Data Sheet (MSDS) to the Site Safety Officer for approval and filing (the Site Safety Officer will maintain copies of all MSDSs on site). MSDSs may not be available for locally obtained products, in which case some alternate form of product hazard documentation will be acceptable. All personnel shall be briefed on the hazards of any chemical product they use and shall be aware of and have access to all MSDSs. All containers on site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

The Hazard Communication standard (29 CFR 1910.1200) has been provided to employees, and a written copy is on file at BCA's office.

5.2 Confined Space Entry

There is no expectation that a confined space will be entered during this project.

6.0. PERSONNEL TRAINING RECORDS

All personnel working within the exclusion zone are required to have 40-hour HAZWOPPER training and be current with refresher training in accordance with 29CFR 1910.120.

7.0 KNOWN OR ANTICIPATED HAZARDS

7.1 General Safety Rules

Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

Smoking, Eating, or Drinking

Smoking, eating and drinking will not be permitted inside any controlled work area at any time. Field workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any BCA-controlled site.

Personal Hygiene

The following personal hygiene requirements will be observed:

Water Supply: A water supply adhering to the following requirements will be utilized:

- An adequate supply of potable water will be available for field personnel consumption.
- Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.
- Non-potable water may be used for hand washing and cleaning activities. Nonpotable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

Non-Potable Water
Not Intended for Drinking Water Consumption

Toilet Facilities:

- A minimum of one toilet will be provided for every 20 personnel on site, with separate toilets maintained for each sex except where there are less than 5 total personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities on-site facilities are not required.

Washing Facilities:

- Employees will be provided washing facilities (e.g., buckets with water and Alconox) at each work location. The use of water and hand soap (or similar substance) will required by all employees following exit from the Exclusion Zone, prior to breaks, and at the end of daily work activities.

Buddy System

All field personnel will use the buddy system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for BCA personnel. Under no circumstances will any employee be present alone in a controlled work area.

7.2 Heat and Cold Stress

Heat and cold stress may vary based upon work activities, PPE/clothing selection, geographical locations, and weather conditions. To reduce the potential of developing heat/cold stress, be aware of the signs and symptoms of heat/cold stress and watch fellow employees for signs of heat/cold stress.

Heat stress can be a significant field site hazard, particularly for non-acclimated personnel operating in a hot, humid environment. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim and the prevention of heat stress casualties. Work-rest cycles will be determined, and the appropriate measures taken to prevent heat stress.

7.3 Responding to Heat-Related Illness

The guidance below will be used in identifying and treating heat-related illness.

Type of Heat-Related Illness	Description	First Aid
Mild Heat Strain	The mildest form of heat-related illness. Victims exhibit irritability, lethargy, and significant sweating. The victim may complain of headache or nausea. This is the initial stage of overheating, and prompt action at this point may prevent more severe heat-related illness from occurring.	• Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids. • If an air-conditioned spot is available, this is an ideal break location. • Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.
Heat Exhaustion	Usually begins with muscular weakness and cramping, dizziness, staggering gait, and nausea. The victim will have pale, clammy moist skin and may perspire profusely. The pulse is weak and fast and the victim may faint unless they lie down. The bowels may move Involuntarily.	• Immediately remove the victim from the work area to a shady or cool area with good air circulation (avoid drafts or sudden chilling). • Remove all protective outerwear. • Call a physician. • Treat the victim for shock. (Make the victim lie down, raise his or her feet 6–12 inches, and keep him or her cool by loosening all clothing).
Heat Stroke	The most serious of heat illness, heat stroke represents the collapse of the body's cooling mechanisms. As a result, body temperature may rise to 104 degrees Fahrenheit or higher. As the victim progresses toward heat stroke, symptoms such as headache, dizziness, nausea can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly and death is imminent if exposure continues. Heat stroke can occur suddenly	• Immediately evacuate the victim to a cool and shady area. • Remove all protective outerwear and as much personal clothing as decency permits. • Lay the victim on his or her back with the feet slightly elevated. • Apply cold wet towels or ice bags to the head, armpits, and thighs. • Sponge off the bare skin with cool water or rubbing alcohol, if available. • The main objective is to cool without chilling the victim. • Give no stimulants or hot drinks. • Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide onsite treatment of the victim and proper transport to a medical facility.

8.0 PHYSICAL HAZARDS AND MITIGATION PROCEDURES

Safe work practices in compliance with OSHA standards and this document will be used at all times. The first aid kit and fire extinguisher are to be on site at all times. The following table lists the anticipated hazards and the associated safety rules for proper control.

Hazard Description	Potential Result	Control Measure
Tool Handling	Cuts, contusions, bruises	Wear gloves, steel-toed boots and safety glasses
Vehicle Traffic	Impact, getting struck by vehicle	Set up safety cones around wells being sampled. Communicate activities with any onsite personnel. Wear reflective vest. Use truck or van as a shield if possible. Set up snow fence for each location where pedestrian walkways are affected and cover all openings or secure with snow fence during all breaks or overnight.
Heat/Cold	Heat stress/frostbite	Heat: Take frequent breaks and drink plenty of fluids. Watch for signs/symptoms of heat stress (fainting, dizziness, excessive sweating) Cold: Wear several layers of clothing, do not work in excessive cold, and take frequent breaks.
Slip, trip and fall	Bruising, sprained ankle/foot/knee	Be aware of surroundings and practice good housekeeping measures around the site area to minimize items that pose a trip hazard.
Splash	Exposure to contaminants in the groundwater – dermal and/or eye	Wear gloves and safety glasses during purging of well and sample collection.
Hazardous Energy Control	Personal injury, electrocution	Use lockout/tagout controls to ensure that hazardous energy sources (electrical) are controlled prior to valve removal activities, including electrical and water pressure. All underground utilities should be marked prior to intrusive activities. A site walk-through should identify all overhead power lines.
Heavy Equipment	Struck by	Keep aware of the location of heavy equipment at all times. If overhead activities are taking place (drilling, digging) hard hats will be used.
Fire and Explosion	Flammable vapors from petroleum may ignite	Monitor for the presence of flammable vapors with an explosimeter. Fire extinguishers should be available. Evacuate the area immediately, call 911 and evaluate the situation.
Noise/Hearing Protection	Active drilling and other processes may exceed noise exposure standard of 85 decibels	Wear appropriate hearing protection.
Biological Hazards	Poisonous vegetation and/or stinging/biting insects or animals	Keep aware of surroundings and if bite or sting takes place seek first aid and/or medical attention

9.0. CHEMICAL HAZARDS POTENTIALLY ON SITE

9.1 Waste Characterization

Potential hazards for each of the tasks presented below are assessed. As work items are being performed, continued monitoring and observation will be used to determine if conditions change. Site Safety Officer will be responsible for continued assessment, and work practice modification in the event that unsafe work practices are observed. The following site activities are anticipated:

- Soil and groundwater sampling, waste disposal

9.2 Hazard Evaluation

Chemicals of Concern: Identify all chemicals that are present or suspected to be present on site and the maximum concentrations detected in soil or water.

Chemical Name	TLV/PEL (8-hour TWA exposure limit for inhalation exposure in breathing zone)	Maximum Concentration in Soil (mg/kg or ppm)	Maximum Concentration in Water (ug/l or ppb)	Health Hazard/Comments
VOCs	Varies	BDL	TBD	Varies
SVOCs	Varies	NA	NA	Varies
PAHs	Varies	TBD	TBD	Varies
PCBs	Varies	NA	NA	Varies
Metals	Varies		NA	Varies
Lead	0.050 mg/m3	13,900	1100	Direct Exposure
TCE	270 mg/m3	288	49.1	Varies

Is free product onsite? __ Yes _X_ No ___ Unsure

Will work tasks be performed inside buildings/enclosures? __ Yes __X_ No

Is there evidence that contaminants present could cause vapor problems in structures on-site?
__Yes _X_No __ Unsure

If Yes, is building mechanically ventilated? __Yes __No _X_ NA

10.0 BIOLOGICAL HAZARDS AND MITIGATION PROCEDURES

Contact with animals, insects, and plants can cause injury and illness to personnel. Care must be taken to ensure that these types of injuries are avoided. Some examples of biological hazards include:

- Wild animals, such as snakes, raccoons, squirrels, and rats. These animals not only can bite and scratch, but can carry transmittable diseases (e.g., rabies). Avoid the animals whenever possible. If bitten, go to the nearest medical facility.

- Insects such as mosquitoes, ticks, bees, and wasps. Mosquitoes can potentially carry and transmit the West Nile Virus or Eastern Equine Encephalitis (EEE). Ticks can transmit Lyme disease or Rocky Mountain Spotted Fever. Bees and wasps can sting by injecting venom, which causes some individuals to experience anaphylactic shock (an extreme allergic reaction). Whenever you will enter areas that provide a habitat for insects (e.g., grass areas, woods), wear light-colored clothing, long pants and shirt, and spray exposed skin areas with a DEET-containing repellent. Keep away from high grass wherever possible. Keep your eyes and ears open for bee and wasp nests. If bitten by insects, see a doctor if there is any question of an allergic reaction.

- Plants such as poison ivy and poison oak can cause severe rashes on exposed skin. Be careful where you walk, wear long pants, and minimize touching exposed skin with your hands after walking through thickly vegetated areas until after you have thoroughly washed your hands with soap and water.

11.0 ADDITIONAL HAZARDS

The following daily log should be filled out whenever an unexpected hazard is encountered. Include injuries, PPE used, or work stoppages caused by unsafe conditions.

Hazard Observed	Date	Observed by (Print Name)	Mitigation Taken/PPE Used

12.0 LIST OF FIELD ACTIVITIES

The following is a list of field activities anticipated for this project:

- The first field activity in this investigation will be utility location. Because this is not an invasive activity, this Site Health and Safety Plan will not be applied to the utility locating contractor.
- Pre-marking of excavation locations will be performed by BCA. This is also not an invasive activity and no hazards are anticipated.
- Soil Excavation and disposal. This activity will be performed by a subcontractor whose personnel will be subject to the provisions of this Health and Safety Plan.
- In-situ chemical application. This activity will be performed by a subcontractor whose personnel will be subject to the provisions of this Health and Safety Plan.
- Drilling soil borings. This activity will be performed by a subcontractor whose personnel will be subject to the provisions of this Health and Safety Plan.
- Monitoring well installation. This activity will be performed by a subcontractor whose personnel will be subject to the provisions of this Health and Safety Plan.
- Groundwater sampling will be performed by BCA and all personnel will be subject to the provisions of this Health and Safety Plan.

All contractors will prepare and submit a Health and Safety Plan (HASP) to the project manager before mobilizing to the Site. The HASP will be reviewed by the project manager and accepted or rejected. The project manager will not approve the contractors HASP and will only review it to assure that it is at least as stringent as the HASP used by the project manager.

The following is a list of field activities that are not currently anticipated for this project:

- Soil Excavation and Disposal. This activity will be performed by a subcontractor whose personnel will be subject to the provisions of this Health and Safety Plan.

- In-situ chemical injections. This activity will be performed by a subcontractor whose personnel will be subject to the provisions of this Health and Safety Plan.

13.0 SITE DESCRIPTION

Type of Facility (describe):	Industrial
Active or Closed/Abandoned:	**Subject Site is vacant**
Describe Surface Features (buildings, paved or unpaved, overhead/underground utilities):	**The Subject Site includes a concrete slab and gravel and grassy lot**
List Any Site Access Restrictions:	**Authorized Personnel only**
Surrounding Neighborhood Description:	**Residential / Commercial**

14.0 PERSONNEL PROTECTIVE GEAR/ENGINEERING CONTROLS

14.1 Personnel Protective Gear

Level D:

Soil concentrations in previous investigations are not expected to cause health risks if handled carefully. Sampling can be performed using modified Level D protection. The following items are needed for modified Level D.

- Hard hat (for overhead hazard activities)
- Steel-toe work boots
- Coveralls and/or long pants with short sleeved shirts (at a minimum)
- Eye protection when a splash hazard exists
- Hearing protection during active drilling or other loud operations
- Nitrile gloves for sampling and/or contact with soil and groundwater.

Modifications:

Modifications to this level of protection will be made if site conditions and/or contamination levels warrant an upgrade in protection level.

Level C:

If site conditions warrant, an upgrade to level C will be made if air monitoring equipment indicates respiratory protection is required. Air-purifying respirators with organic vapor cartridges will be used in this situation. The MSDS for that substance shall be consulted to determine the appropriate personal protective equipment (i.e. chemical resistant coveralls/gloves, chemical goggles, respiratory protection).

Surveillance Equipment and Materials:

Photoionization Detector

Work Limitations (Time of Day, etc.):

All sampling operations will be conducted during daylight hours. No smoking or eating during soil handling procedures.

14.1.1 PPE Donning and Doffing Information

The following information is to provide field personnel with helpful hints that, when applied, make donning and doffing of PPE a safer and more manageable task:

- Never cut disposable booties from your feet with basic utility knives. This has resulted in workers cutting through the booty and the underlying sturdy leather work boot, resulting in significant cuts to the legs/ankles. Recommend using a pair of scissors or a package/letter opener (cut above and parallel with the work boot) to start a cut in the edge of the booty, then proceed by manually tearing the material down to the sole of the booty for easy removal.

- When applying duct tape to PPE interfaces (wrist, lower leg, around respirator, etc.) and zippers, leave approximately one inch at the end of the tape to fold over onto itself. This will make it much easier to remove the tape by providing a small handle to grab while still wearing gloves. Without this fold, trying to pull up the tape end with multiple gloves on may be difficult and result in premature tearing of the PPE.

- Have a "buddy" check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation.

- Never perform personal decontamination with a pressure washer.

14.2 Medical Surveillance Requirements

All personnel must have completed the appropriate medical monitoring requirements as specified in 29 CFR 1910.120. Documentation of medical monitoring is the responsibility of each employer.

14.3 Engineering Control

The engineering control to prevent pedestrian/general population from exposure to hazards at the work site is Site Control.

14.3.1 Site Control Measures

Site controls establish the hazardous area perimeter and prevent access or exposure by unauthorized personnel or the public. The site map is attached to the Field Instructions and is incorporated as part of the HASP. The "buddy system" is to be used throughout those site operations that require it.

Site Entry Procedures: Notify property owner before mobilizing to the site.

Perimeter establishment/identification: The entire perimeter of the Site is enclosed by chain link fencing.

An exclusion zone, contamination reduction zone and support zone will be identified for each site activity. The exclusion zone and contamination reduction zone are shown on the attached site map.

14.3.2 Emergency First Aid Procedures

If eye irritation, nausea, vomiting, dizziness, unusual odors or any other unusual mental or physical sensations are noticed, seek medical assistance.

Inhalation: Move person to fresh air, seek medical assistance.
Ingestion: Do not induce vomiting, seek medical attention.
Eyes: Flush with copious amounts of water.
Skin: Wash with soap and water.

15.0 AIR MONITORING REQUIREMENTS

Where VOC's are present, all soil samples will be field screened for volatile organics using a photoionization detector (PID). During soil sample collection, it is expected that headspace gasses will be below the action level. However, during the course of soil sampling, if headspace gasses exceed 100 ppm, breathing zone monitoring will be conducted. If volatile gasses are detected in the breathing zone, the work activities work will stop and breathing zone gasses will be monitored using the FID or one of the other detectors outlined below. Further work may be conducted after elimination of all ignition sources, increasing the monitoring frequency, or elevate the level of PPE.

Instrumentation Available for Higher Level Air Monitoring:

INSTRUMENT	MANUFACTURER/MODEL*	SUBSTANCES DETECTED
Photo Ionization Detector (PID)	**RAE Systems MiniRAE 3000 (10.6 eV Lamp)**	**Hydrocarbons / Organic Solvents**
Colorimetric Detector Tubes	**Sensidyne, Draeger**	**Trichloroethene 0.5–10 ppm**
Particulate Monitor	**MIE Model PDM-3 mini-RAM**	**Aerosols, mist, dust, and fumes**

16.0 DECONTAMINATION PROCEDURES

Decontamination Procedures:

Contamination may result from walking through contaminated soils or liquids, splashing liquids during sampling, or use of or contact with contaminated equipment.

Decontamination procedures for the following tasks will be observed onsite:

- Groundwater Sampling: The submersible bladder pump is to be decontaminated with an Alconox wash and rinsed with water prior to sampling, and between each sample location.

- Soil Sampling: When a hand auger is used during soil sampling, it will be decontaminated with a detergent wash and distilled water rinse before and between sampling.

- PPE: All contaminated, disposable clothing will be properly bagged for disposal and left onsite for proper disposal. The PPE may be added to the soil drums for disposal.

- Equipment: Equipment operating in the hot zone will be decontaminated before moving the equipment out of the zone. Decontamination will include shoveling and brushing off any soil and using a pressure washer or water stream to rinse off residual dust and dirt. Soil and wash water may be disposed after testing.

17.0 WASTE STORAGE/DISPOSAL

Investigation-derived Material Disposal:

The purge and decontamination water, and disposable protective gear are to be placed in 55 - gallon drums, labeled and stored on site pending the receipt of the laboratory analysis. Free product and contaminated water must remain on-site until the proper disposal method is determined.

The drums of investigative waste will be hauled by a contractor who will be subject to the provisions of this site Health and Safety Plan. Waste disposal will be performed in a manor appropriate to the waste characteristic identified by waste profiling.

17.1 Spill Containment Program

No anticipated spills or releases of hazardous chemicals are associated with this project. Any spills will be contained and drummed for proper disposal.

18.0 DOCUMENTS EXPECTED TO BE COMPLETED

The Site Safety Officer will maintain a master Site Health and Safety Plan which will be updated with the Daily Log (Section 11.0) and daily sign in sheets. In the event that site conditions warrant updating this Site Health and Safety Plan, updated sections will be appended to this plan. The master Site Health and Safety Plan will be archived in the project file at the offices of BCA for ten years following the end of the project.

Other documents which will be maintained include field books, boring logs, groundwater sampling sheets, contractor provided MSDSs, and correspondence.

19.0 APPROVALS

I, the undersigned, attest that I am familiar with the contents of this Health and Safety Plan and do agree to administrate the procedures described herein.

Plan Prepared by:___David Scovel____Date:_12/05/2022

Plan Approved by:____John Kilmer______________________________________ Date_12/05/2022__

Health and Safety Officer:____David Scovel_______________________________ Date: _12/05/2022__

20.0 EMPLOYEE ACKNOWLEDGMENT

The designated BCA employee shall be responsible for informing all individuals entering the exclusion zone of the contents of this plan, and ensuring each person signs the employee acknowledgment form. By signing this form, individuals are recognizing the hazards present on site and the policies and procedures required to minimize exposure or adverse effects of these hazards.

I have read the site health and safety plan and have been briefed and fully understand all of the following aspects of the project:

Hazards associated with the project:

1. Personal protective equipment;
2. Emergency procedures/contacts;
3. Project team-member responsibilities; and,
4. Work zones and decontamination procedures.

I have undergone medical monitoring and have been respirator fit-tested in the last year.

Form must be signed each day on site.

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

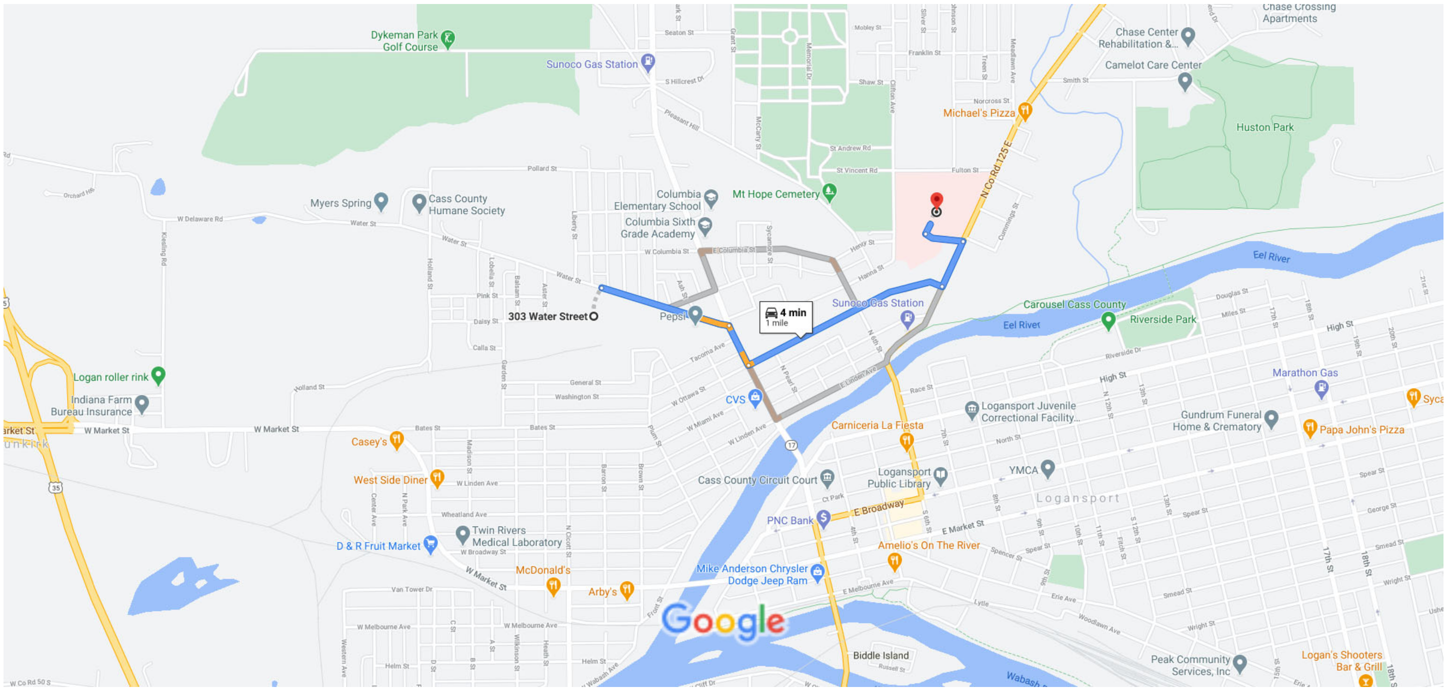
Signature:________________________________ Date:_______________

Signature:________________________________ Date:_______________

Google Maps

303 Water Street, Logansport, IN to Logansport Memorial Hospital

Drive 1.0 mile, 4 min



Map data ©2020 500 ft

via Water St and E Ottawa St — 4 min
Fastest route — 1.0 mile

via N Co Rd 125 E/Michigan Ave — 4 min
1.2 miles

via E Columbia St — 4 min
1.1 miles

Explore Logansport Memorial Hospital

Restaurants Hotels Gas stations Parking Lots More

Appendix K

Quality Assurance Project Plan

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

QUALITY ASSURANCE PROJECT PLAN (QAPP)

FORMER EXIDE BATTERY SITE
303 WATER STREET
Logansport, Indiana 46947

December 7, 2022

Prepared for:
City of Logansport

Prepared by:
BCA Environmental Consultants, LLC

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VP Technical Services

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INTRODUCTION

On behalf of the City of Logansport (City), this Quality Assurance Project Plan (QAPP) was prepared by BCA Environmental Consultants, LLC (BCA) for the former Exide Battery (Exide) Site located at 303 Water Street Street, Logansport, Indiana 46947. This QAPP was developed following the guidance presented in the United States Environmental Protection Agency (U.S. EPA) document QA/R-5 *Instructions on the Preparation of a Superfund Division Quality Assurance Project Plan*, dated June 2000. The Indiana Department of Environmental Management (IDEM) requires that all environmental monitoring and measurement efforts participate in a centrally managed quality assurance (QA) program. Any party generating data under this program has the responsibility to implement minimum procedures to assure that the precision, accuracy, completeness, and representativeness of its data are known and documented. To ensure the responsibility is met uniformly, each Party must prepare a written Quality Assurance Project Plan (QAPP) covering each project it is to perform. This QAPP presents the organization, objectives, functional activities and specific quality assurance (QA) and quality control (QC) activities associated with the sampling for the site. This QAPP also describes the specific protocols which will be followed for sampling, sample handling and storage, chain-of-custody, and laboratory (and field) analysis. All QA/QC procedures will be in accordance with applicable professional technical standards, IDEM requirements, government regulations and guidelines, and specific project goals and requirements. This QAPP is prepared by BCA in accordance with IDEM QAPP guidance documents.

ACRONYM LIST

ACM – Asbestos Containing Material

AHERA – Asbestos Hazard Emergency Response Act

ASTs – Aboveground Storage Tanks

ASTM – American Society for Testing and Materials

BCA – BCA Environmental Consultants, LLC

CAHs – Chlorinated Aliphatic Hydrocarbons

CFR – Code of Federal Regulations

CNS – Covenant Not to Sue

COC – Chain of Custody

DI – Deionized

DQOs – Data Quality Objectives

HASP – Health and Safety Plan

IBP – Indiana Brownfields Program

IDEM – Indiana Department of Environmental Management

IFA – Indiana Finance Authority

LCSs – Laboratory Control Samples

MDLs – Method Detection Limits

MS/MSD – Matrix Spike/Matrix Spike Duplicate

O&M – Operation and Maintenance

OSHA – Occupational Safety and Health Administration

PARCCS – Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity

PCBs – Polychlorinated Biphenyls

PAHs – Polynuclear Aromatic Hydrocarbons

PE – Performance Evaluation

PID – Photoionization Detector

PPE – Personal Protective Equipment

QA – Quality Assurance

QAPP – Quality Assurance Project Plan

QA/QC – Quality Assurance/Quality Control

QC – Quality Control

QLs – Quantitation Limits

RbCG – Risk-based Closure Guide or R2

RPD – Relative Percent Difference

RSD – Relative Standard Deviation

RWP – Remediation Work Plan

SAP – Sampling and Analysis Plan

SOPs – Standard Operating Procedures

SVOCs – Semivolatile Organic Compounds

U.S. EPA – United States Environmental Protection Agency

USTs – Underground Storage Tanks

VOCs – Volatile Organic Compounds

1.0 PROJECT MANAGEMENT

The purpose of this document is to describe the personnel, procedures, and methods for ensuring the quality, accuracy, and precision of data associated with the Exide Site. Following the procedures outlined in this Quality Assurance Project Plan (QAPP) will ensure that the project data meet Indiana Department of Environmental Management (IDEM) standards.

1.1 Project Organization and Responsibility

Figure 1 presents the organizational structure for the planned work at the former Exide Site. All lines of communication, management activities, and technical direction within this project team will follow this organization arrangement. Any formal directions or communications from the IDEM/IBP will be given to the City of Logansport, Deputy Mayor. The City will subsequently communicate directions to the BCA Environmental Consultants, LLC (BCA) project manager. The IDEM/IBP project manager will be notified of all changes in personnel.

Responsibilities of key project personnel are outlined below.

IDEM/IBP Project Manager

1. Direct, review, and approve QAPP and RWP.
2. Provide technical consultation services to the City of Logansport, and BCA project manager.
3. Review and approve changes to the RWP.
4. Review all final reports.

City of Logansport Deputy Mayor

1. Direct project activities.
2. Responsible for review of project deliverables, development of project planning, and the overview of project strategies.
3. Review site reports for consistency with objectives stated in work plans.

BCA Project Manager

1. Responsible for planning, coordinating, monitoring, and evaluating of field sampling.
2. Resolve technical problems.
3. Discuss and review with team members analytical results prior to completion of reports.
4. Responsible for environmental reports and documents.

BCA Quality Assurance Manager

1. Oversee assessment activities to ensure that sampling methodology, sample preservation methods, and COC procedures are being followed.
2. Assist in any QA issues with field or laboratory questions, as needed.
3. Maintain a record of samples submitted to the laboratory, the analyses being performed on each sample, the final analytical results, and quality control/ data validation reports.
4. Conducts Data Assessment.

BCA Field Team

1. Be responsible for oversight of field activities and ensure that procedures for the field activities related to the QAPP are executed and documented properly.
2. Submit data generated during field assessment to the data manager.

3. Procuring, coordinating and qualifying all subcontractors.
4. Before sampling, meet with project manager to discuss and establish sampling purposes, sampling methodology, number of samples, size of samples, sample preservation methods, COC requirements, analyses required, and which samples will be duplicated in the field.
5. Be responsible for collection of equipment needed sampling work, which would include personal protective equipment (PPE), sampling equipment, sample containers and coolers, water-level meters, monitoring devices, and any other equipment deemed necessary.
6. Conduct sampling or oversee drilling and soil boring work to ensure that proper procedures are followed.
7. Monitor hazardous conditions while conducting field operations.
8. Submit COC records and field paperwork to field team leader.

Laboratory Project Manager

1. Responsible for samples submitted to Laboratory, including those released to a subcontracted laboratory.
2. Responsible for summarizing quality assurance/quality control (QA/QC) requirements for the project, including those samples analyzed by subcontracted laboratories.
3. Maintain laboratory schedule and ensure that technical requirements are understood by laboratory personnel.
4. Provide technical guidance to project manager.
5. Ensure accuracy of the laboratory data.

Laboratory QA Manager

1. Responsible for evaluating adherence to policies and ensuring the systems are in place to provide QA/QC as defined in the QAPP.

2. Initiate and oversee audits of corrective action procedures.
3. Perform data reviews.
4. Maintain documentation of training.

Mr. John Morris is the IBP Project Manager. Mr. Jacob Pomasl is Deputy Mayor of the City of Logansport and primary City contact for this project.

Mr. David Scovel will serve as the BCA project manager. John Kilmer will serve as the BCA QA manager. BCA field team leaders for the delineation and closure sampling will be Mr. David Scovel and Mr. Jake Allgood. Other supporting staff from BCA may be assigned on an as-needed basis.

All site personnel will be trained as mandated by the Occupational Safety and Health Administration (OSHA) Act regulations (29 Code of Federal Regulations [CFR] 1910.120). Additionally, all site personnel will be properly trained in the procedures for collecting, labeling, packaging, and shipping of liquid and solid environmental samples. The QA Manager will maintain personnel training records. Field personnel will be trained to use all monitoring devices and other equipment used in the field.

The laboratory for the analytical work required for this project is PACE Analytical Services, Inc. (PACE), located in Indianapolis, Indiana. The laboratory have been certified by the (National Environmental Laboratory Accreditation Program) NELAP or equivalent. Steve Sayer is the PACE laboratory director. Regina Bedel will serve as the PACE project manager. She will be ultimately responsible for ensuring the quality of the laboratory data. The PACE QA Manager will be Anne Troyer.

The drilling subcontractor (if any) for any boring or wells has not yet been selected for this project. However, all on-site drilling personnel shall have completed the applicable OSHA training. Additionally, drilling personnel will be required to comply with all site safety regulations covered in the site-specific HASP, provided under separate cover to this QAPP.

1.2 Facility History/Background Information

Source of Contamination

The Former Exide Corporation facility is located at 303 Water Street in Logansport, Indiana (Subject Site) and consists of a single parcel totaling approximately 17.41 acres of land located within city limits. The Subject Site operated as a rail yard and was part of the Terre Haute & Indianapolis Railroad – Vandalia Line from at least 1885 – 1930s. Former railroad operations associated with the Subject Site included rail sidings and maintenance facilities (roundhouse). The Site also operated as the National Steel Construction Company – Logansport Plant, manufacturers of steel products from at least 1949 to the late 1950's. General Tire reportedly operated the plant until it was purchased by Exide in 1959. Exide operated the Subject Site as a lead-acid storage battery manufacturing facility for the automotive industry from about 1960 into the 1990's, and at a limited capacity before fully shutting down in 2009. The factory buildings were demolished in 2016 and the Subject Site has since been vacant. The area near the Subject Site is largely residential land with other industrial properties nearby. The Site is located on the south side of Water Street, between Aster Street and residential properties to the west and commercial properties to the east. The former Logansport & Eel River Short Line railroad (abandoned) adjoins along the south side of the Site with the former Trelleborg Automotive property beyond. Residential and commercial properties are located to the north across Water Street. Aside from the former factory building's concrete floor and footprint, no structures exist on the Subject Site.

Initial investigations concerning the Subject Site were conducted from 2020 to 2022. The investigations identified the presence of lead above the IDEM Risk-based Closure Guide (RbCG or R2) Excavation Direct Contact Human Health Levels (EDC HHLs) in the shallow soils throughout the north half of the Subject Site around the former building, and the presence of chlorinated aliphatic hydrocarbons (CAHs), specifically trichloroethene (TCE) in the soil and groundwater at the east end of the former factory building. The potential is present for the TCE to migrate off-site in excess of the IDEM R2 HHLs. The potential for vapor migration and vapor intrusion to adjoining properties to the east has also been identified.

The nature and extent of impacted soil and groundwater has been fully delineated. However, soil gas and the potential for vapor encroachment or vapor intrusion into adjoining properties have not been fully investigated.

Exposure Pathways

Currently, excavation worker direct contact exposure pathways (soils) are known to be complete. Other potential exposure pathways are limited to vapor intrusion to adjoining commercial property.

1.3 Project Description and Schedule

Data Gap Investigations

Data gaps for which further investigation is planned include:

1. Vapor intrusion investigation of the adjoining commercial property.
2. Investigation of the TCE area to determine vertical extents (bedrock) of groundwater impacts.
3. Delineation of lead in soil hotspots.

Remediation

The planned remediation is described in detail in Section 6 of this RWP. To summarize, the planned remediation includes:

- Removal of the remaining structure (concrete slab and foundations)
- Excavation and removal of lead impacted soils above 2x the IDEM R2 EDC HHL.

- Excavation and removal of TCE impacted soils above the IDEM R2 IDC HHLs.
- Optional application of soil amendment in the TCE impacted area.
- Use of institutional controls (ICs) to prohibit future use of groundwater for potable purposes, including an Environmental Restrictive Covenant (ERC) for the Subject Site. A current local ordinance exists that restricts the installation and use of potable water wells within Logansport City limits and no privately-owned drinking water wells have been identified within the area around the Subject Site. Additional ICs may be used as necessary to address any groundwater risks post remediation.
- Use of ERCs on the Subject Site requiring the use of vapor mitigation systems such as vapor barriers (passive) and sub-slab depressurization systems (active) for any future structure(s) situated in the east end of the Subject Site.
- If neighboring properties are impacted by vapor intrusion, then use of ERCs requiring the use of vapor mitigation systems, if needed.
- Install monitoring wells to conduct quarterly groundwater monitoring and confirm limits and stability of TCE plume.

A NELAP-certified laboratory will be used to ensure overall analytical quality. PACE will be the primary laboratory used for analyses. Copies of their NELAP certificates are included in Appendix A.

1.4 Data Quality Objectives (DQOs)

DQOs are qualitative and quantitative statements that clearly state the objective of a proposed project, define the most appropriate type of data to collect, determine the appropriate conditions for data collection, and specify acceptable decision error limits that establish the quantity and quality of data needed for decision making. The DQOs are based on the use of the data that will be generated. Different data uses may require different quantities of data and levels of quality.

1.4.1 Analytical Quality Objectives

Analytical quality objectives are used to ensure that the analysis will accurately and adequately identify the contaminants of concern, and to ensure that the analysis selected will be able to achieve the quantitation limits less than or equal to the target cleanup levels.

1.4.1.1 Field Screening

Field-screening instruments provide a lower quality of analytical data compared to laboratory equipment in a controlled environment. However, field methods provide rapid "real-time" results for field personnel in order to help guide field decision-making processes. These techniques are often used for health and safety monitoring, initial site characterization to locate areas for detailed assessment, and preliminary comparison of remedial objectives. During sampling and remediation activities, the breathing space of site personnel may be monitored for the presence of semi-volatile organic vapors using a photo-ionization detector (PID). The PID may also be used to perform field screening of soil samples in order to assist in the selection of samples to be submitted for laboratory analysis. Generally, the soil interval with the highest PID readings at a boring or sampling location will be submitted to the laboratory. If no volatile organic vapors are detected by the PID, samples will be selected for laboratory analysis based on the following:

- Obvious discoloration, odor, or other visible signs of contamination.
- If no visible or odorous signs of contamination are evident, a sample from the zone directly above the water table will be submitted.
- A sample from a depth corresponding to the zone in the subsurface expected to contain the greatest concentration of contaminants will be submitted. This selection will be based on the type of release and the

history of the area being investigated and will be determined by the BCA project manager.

1.4.1.2 IDEM Analyses

The City of Logansport may wish to obtain a no further action (NFA) letter or Site Status Letter (SSL) from the IBP. Therefore, all laboratory analyses will be conducted under IDEM DQO protocol as set out in the Risk-based Closure Guide (RbCG or R2).

PACE, a NELAP-certified laboratory, will be the primary laboratory for this project (Certificates located in Appendix A). A NELAP-certified laboratory is one that has undergone performance evaluations performed by a state agency for method accuracy and precision, and meets the requirements set forth by the U.S. EPA. Volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs) analyses will be performed by PACE at their Indianapolis and Minneapolis laboratories. Table 2 summarizes the analyses performed by each of the laboratories.

1.4.2 Project Quality Objectives

The project quality objectives process is a series of planning steps designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application. There are five steps in the project quality objectives process that include problem statement, decision identification, decision inputs, assessment boundary, and the decision process. The details of these steps are provided in the following sections.

1.4.2.1 Problem Statement

The City of Logansport intends to conduct soil remediation and groundwater monitoring at the former Battery Site. Remediation will include removal of the trichloroethylene soil source area and removal of the most elevated soil lead concentrations. A Remediation Work Plan (RWP) will be submitted with this QAPP. Most of the impacted soils and groundwater will be remediated by excavation of soil sources. Excavated soils will transported and disposed of at an approved landfill. Closure sampling will be conducted at remediated areas. Monitoring wells will be installed and monitored for at eight (8) quarters. A Closure report will be prepared and submitted to IDEM for review and approval.

1.4.2.2 Decision Identification

Hotspot delineation sampling may be used to identify the extend and magnitude of the sources and limits of soil for which removal is needed. Soil confirmation closure samples will be used to confirm the limits of impacted soil removed. Groundwater samples may be used to confirm remediation of groundwater.

1.4.2.3 Decision Inputs

During delineation sampling in the chlorinated solvent area, the concentrations of TCE in the soil will be determined. During delineation sampling in the lead impact area, the concentrations of lead in the soil will be determined. During closure sampling the presence of VOCs (in the TCE-impacted area) and lead (in the lead-impacted area) in the soil will be determined.

1.4.2.4 Assessment/Remediation Boundary

Site maps showing the site limits and remediation areas are attached.

1.4.2.5 Logansport Decision Process

The closure goals in the soil are the RbCG industrial direct-contact human health level (IHHL) for lead (based on average soil concentration in the affected area); the residential HHL for VOCs in the solvent area (to minimize potential for migration to groundwater). For groundwater the goal will be plume stability with HHLs at the down-gradient property line from RbCG 2022. The IDEM RbCG soil screening levels are presented in Table 3 (located at the end of the QAPP).

1.5 Quality Assurance Objectives for Measurement

The overall QA objective for each project is to develop and implement procedures for field sampling, COC, laboratory analysis, and reporting using RbCG protocol. Specific procedures for sampling, COC, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, audits, preventative maintenance of field equipment, and corrective action are described in other sections of this QAPP.

Data quality objectives for measurements during this project will be addressed in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). The numerical PARCCS parameters will be determined from the project DQOs to ensure that they are met. The DQOs and resulting PARCCS parameters will require that the sampling be performed using standard methods with properly operated and calibrated equipment, and conducted by trained personnel.

1.5.1 Precision

Precision is the degree of agreement among repeated measurements of the same parameter under the same or similar conditions. Precision is reported as either relative percent difference (RPD) or relative standard deviation (RSD), depending on the end use of the data.

1.5.1.1 Field Precision Objectives

Field precision will be assessed through the collection and analysis of field duplicate samples. RPDs will be calculated for the detected analytes from investigative and field duplicate samples. Water matrix samples can be readily duplicated due to their homogeneous nature; conversely, the duplication of soil or sediment samples is much more difficult due to their nonhomogeneous nature. Due to this difficulty, RPDs of ±35 percent for water and ±50 percent for soil sample field duplicates will be used as advisory limits for analytes detected in both investigative and field duplicate samples at concentrations greater then or equal to five times its quantitation limit. A summary of duplicate samples to be collected is presented in Table 4 (presented at the end of the QAPP), along with the other quality control samples. Per the IDEM RbCG guidance, field duplicate samples must be provided for each matrix (soil, groundwater and air) sampled. The minimum number of field duplicate samples required for each round of sampling is one for every 20 samples. If there are fewer than 20 samples, one field duplicate will be submitted.

1.5.1.2 Laboratory Precision Objectives

For the laboratory, precision of laboratory analyses will be based upon laboratory matrix spike/matrix spike duplicate (MS/MSD) analyses. Precision is reported as RPD or RSD, and the equation to be used to determine precision is presented in Section 4.3.1. MS/MSD analyses will be either at a rate of 1 per 20 samples received by the laboratory or in accordance with laboratory Standard Operating Procedures (SOPs). Table 3 lists the MSD and RPDs used by the laboratory.

1.5.2 Accuracy

Accuracy is the extent of agreement between an observed or measured value and the accepted reference, or true, value of the parameter being measured.

1.5.2.1 Field Accuracy Objectives

The objective for accuracy of the field sample collection procedures will be to ensure that samples are not affected by sources external to the sample, such as sample contamination by ambient conditions or inadequate equipment decontamination procedures. Sampling accuracy will be assessed by evaluating the results of equipment and trip blank samples for contamination.

A trip blank will consist of a laboratory-prepared sample of reagent-grade water. Trip blanks will accompany sample containers and be subjected to the same handling procedures as the field samples, but will not be opened and will be shipped back to the laboratory with the samples. Trip blanks are required only when VOCs will be analyzed. Trip blanks will be submitted at the rate of one trip blank per shipping container containing field samples for laboratory VOC analysis. The trip blank samples will provide a measure of potential cross contamination of samples by VOCs during shipment and handling.

Equipment blanks will be collected by pouring laboratory-prepared water or distilled water over or through the field sampling equipment and collecting the rinsate in the proper analytical containers. Equipment blanks must be submitted to the laboratory with investigative samples and analyzed for the same parameters as the investigative samples. The minimum required is one per 20 field samples per matrix or, if less than 20 samples are collected, one equipment blank per day per sample matrix.

Trip and equipment blanks will be analyzed during assessment activities in order to assess potential problems as they occur.

1.5.2.2 Laboratory Accuracy Objectives

The laboratory accuracy will be assessed by determining percent recoveries from the analysis of laboratory control samples (LCSs) or standard reference materials (SRMs). The analyses of MS/MSD samples are also utilized to determine laboratory accuracy by determining percent recoveries from the analysis of MS/MSD samples. MS/MSD samples will be collected for organic and inorganic analyses at a minimum frequency of 1 per 20 or fewer samples. The equation used to determine accuracy for this project is presented in Section 4.3.2.3.

The accuracy of the organics analyses also will be monitored through analysis of surrogate compounds. Surrogate compounds are added to each sample, standard, blank, and QC sample prior to sample preparation and analysis. Surrogate compounds are not expected to be found occurring naturally in the samples, but behave analytically similar to the compounds of interest. Consequently, surrogate compound percent recoveries will provide information on the effect that the sample matrix exhibits on the accuracy of the analyses.

In addition, please see the QA Manual, located in Appendix B of this QAPP, for the laboratory's QA objectives.

1.5.3 Representativeness

Representativeness is a qualitative term that describes the extent to which a sampling design adequately reflects the environmental conditions of the site. It also reflects the ability of the sample team to collect samples and laboratory personnel to analyze those samples in such manners that the data generated accurately and precisely reflect the conditions at the site.

1.5.3.1 Measures to Ensure Representativeness of Field Data

Representativeness will be achieved by establishing the level of allowable uncertainty in the data and then statistically determining the number of samples needed to characterize the population through the DQO process. It will also be achieved by ensuring that sampling locations are properly selected. Representativeness is dependent upon the proper design of the sampling program and will be accomplished by ensuring that this QAPP, the RWP, and standard procedures are followed. The QA goal will be to have all samples and measurements representative of the media sampled. Field testing for pH, temperature, and specific conductivity stabilization prior to groundwater sampling will ensure that representative samples are collected. Soil intervals will be homogenized for all analyses except VOCs to help ensure that representative soil samples are collected.

1.5.3.2 Measures to Ensure Representativeness of Laboratory Data

Representativeness of laboratory data cannot be quantified. However, adherence to the prescribed analytical methods and procedures, including holding times, blanks, and duplicates, will ensure that the laboratory data is representative.

1.5.4 Completeness

Completeness is defined as the measure of the quantity of valid data obtained from a measurement system compared to the quantity that was expected under normal conditions. While a completeness goal of 100 percent is desirable, an overall completeness goal of 90 percent may be realistically achieved under normal field sampling and laboratory analysis conditions.

1.5.4.1 Field Completeness Objectives

The field-sampling team will take measures to have data generated in the field be valid data. However, some samples may be lost or broken during handling and transit. Therefore, field completeness goals for this project will be to have 90 percent of all samples be valid data. The equation for calculating completeness is presented in Section 4.3.5.1.

1.5.4.2 Laboratory Completeness Objectives

Laboratory completeness will be a measure of the quantity of valid data measurements and analyses obtained from all the measurements and analyses completed for the project. The laboratory completeness goal is for 90 percent of the samples analyzed to be valid data. The procedure for determining laboratory data validity is provided in Section 4.2.2. The equation for calculating completeness is presented in Section 4.3.5.1.

1.5.5 Comparability

The confidence with which one data set can be compared to another is a measure of comparability. The ability to compare data sets is particularly critical when a set of data for a specific parameter is compared to historical data for determining trends.

1.5.5.1 Measures to Ensure Comparability of Field Data

Ensuring that this QAPP and the RWP are adhered to and that all samples are properly handled and analyzed will satisfy the comparability of field data. Additionally, efforts will be made to have sampling completed in a consistent manner by the same sampling team.

1.5.5.2 Measures to Ensure Comparability of Laboratory Data

Analytical data are comparable when the data are collected and preserved in the same manner followed by analysis with the same standard method and reporting limits. Data comparability is limited to data from the same environmental media. Analytical method quality specifications have been established to help ensure that the data will produce comparable results. Table 3 summarizes the laboratory reporting limits.

1.5.6 Sensitivity

Sensitivity is the ability of a method or instrument to detect a parameter to be measured at a level of interest.

1.5.6.1 Measures to Ensure Field Sensitivity

The sensitivity of the photoionization detector (PID) or flame ionization detector (FID) used to screen samples for organic vapors is relative to background readings in ambient air.

1.5.6.2 Measures to Ensure Laboratory Sensitivity

The sensitivity requirements for laboratory analyses are to be such to an extent as to meet IDEM RbCG standards for both soil and groundwater, IDEM ACM standard of ***1%***, and the U.S Department of Housing and Urban Development (HUD) standard for lead-based paint of 0.5 percent by weight.

Table 3 presents the laboratory reporting limits.

1.6 Documentation and Records

Records generated during delineation and closure activities are a critical part of any property assessment. BCA will use select documents for recording information during project activities. Records to be used for project documentation include field forms, field books, laboratory data sheets, COC forms, and technical papers. BCA will retain the records generated during delineation and closure activities for a minimum of 10 years following the completion of this project.

At a minimum, the Closure Report submittal packages will include the following:

- Text describing field-sampling methodologies, analytical results, conclusions, and recommendations.
- Figures showing property location, property boundaries, sampling locationa and summaries of impacted areas.
- Tables comparing all laboratory data to the applicable standards.
- A summary of QA/QC analytical results.
- Complete laboratory reports, including QA/QC report and copies of all COC records.
- Copies of sampling logs.
- Other relevant material needed to support property redevelopment.

2.0 DATA GENERATION AND ACQUISITION

The purpose of the QAPP is to produce reliable data that will be generated throughout the assessment by:

- Ensuring the validity and integrity of the data;
- Ensuring and providing mechanisms for ongoing control of data quality;
- Evaluating data quality in terms of PARCCS; and
- Providing usable, quantitative data for analysis, interpretation, and decision making.

2.1 Sampling Process Design

Sample locations, analytical parameters, and frequency of sampling are discussed in the RWP. Laboratory test parameters for the sampling program will include analysis for one or more of the following parameters:

- VOCs (Method 8260)
- SVOCs/PAHs (Method 8270/8270SIM)
- Total metals (Methods 6010),
- Mercury (Methods 7470/7471)

The laboratory SOPs for these analytical parameters are presented in Appendix B.

Analytical parameters are chosen based on past investigations of the site which demonstrate that certain analytes exceed the closure limits in specific areas of the site. Sampling occurred as a stepwise process. During Phase II sampling activities, a variety of chemicals of concern were analyzed. The results indicated that only certain chemicals of concern exceeded the clean-up goals. Therefore, delineation and closure sampling will be limited to only those specific compounds shown to exceed limits in the initial sampling events.

QA/QC samples will be submitted in accordance with the QAPP protocols presented in the following sections. Requirements for QA/QC samples are presented in Table 4.

2.2 Analytical Methods Requirements

In order to preserve the integrity of samples both before and during analyses, specific analytical methods and requirements for those methods will be followed. Samples will be collected, prepared, and analyzed in accordance with the analytical methods outlined in the laboratory SOPs (Appendix B). The laboratory will coordinate all analytical services for this assessment. The specific analytical method and reporting limits for each parameter are presented in Table 3. Preparatory methods for analytical parameters are discussed in the laboratory SOPs included in Appendix B.

Proper sample containers, preservation, holding times, and volumes for each analytical parameter are outlined in Table 5 (presented at the end of the QAPP). The laboratory will provide all sample containers and preservatives for this project.

All sample containers supplied by the laboratory will be cleaned according to U.S. EPA standards. QC documentation will be supplied with the sample containers and preservatives in order to verify their purity. The containers and preservatives can be traced back to their certificate of analysis from their lot number. The QC documentation/certificate of analysis shall be maintained on file with the laboratory. Additionally, the laboratory shall provide the field team with trip blanks for VOC analysis and laboratory-grade deionized (DI) water for rinsing field equipment and instruments.

2.3 Sample Handling and Custody Requirements

Proper sample handling and custody procedures are crucial to ensuring the quality and validity of data obtained through field and laboratory analyses. For example, the admissibility of environmental data as evidence in a court of law is dependent on the custody of the data. Custody procedure will be used to document the authenticity of data collected during the project. The data requiring custody procedures include field samples and data files that can include field books, logs, and laboratory reports. An item is considered in custody if it is:

- In a person's possession;
- In view of the person after being in their possession;
- Sealed in a manner that it can not be tampered with after having been in physical possession; or
- In a secure area restricted to authorized personnel.

2.3.1 Sample Collection Documentation

Sample-handling procedures include field documentation, COC documentation, sample shipment, and laboratory sample tracking. Various aspects of sample handling and shipment, as well as the proposed sample identification system and documentation, are discussed in the following sections.

2.3.1.1 Field Books

Detailed records of the field activities will be maintained in field books. Entries will be dated and signed by personnel recording the data. The entries will be made in ink. Each field book will have a unique numerical identifier permanently attached, and each page will be numbered, permitting indexing of key data. At a minimum, information recorded in the field books will include documentation of sample locations, sampling times, types of samples collected, weather conditions, and any other information pertinent to the assessment.

2.3.1.2 Field Identification System

Each sample collected during environmental assessments will be given a unique identification code. Each unique sample identification will consist of the following:

- *Project Identification Code.* A two-letter designation will be used to identify the property from which the sample was collected. Examples of this include the following:

  SG – Smitty's Gas Station
  BF – Bulk facility

- *Sample Matrix Code.* Each sample will be further identified by a code corresponding to the sample matrix:

  GW – groundwater sample
  SW – surface water sample
  SD – sediment sample
  SS – surface soil sample
  SB – subsurface soil sample
  TB – trip blank sample
  EB –equipment blank sample
  FD – field duplicate sample.

- *Location Code.* Lastly, each sample will be identified by a location code and interval as follows (note that surface water, sediment, and surface soil samples will be numbered consecutively and not given an additional location identifier):

MW-## - monitoring well location
P-## - location of Geoprobe® or other direct-push probe
B-## - location of borings completed by methods other than direct-push.

- *Examples:*

SG-GW-MW-01 = groundwater sample from Monitoring Well 1 Smitty's Gas Station property

SG-GW-MW-01-FD = duplicate groundwater from MW 1

Sample bottle labels appropriate for the size and type of containers shall be provided by the laboratory. The sample containers will be labeled at the time of sample collection but prior to being filled. Each label will indicate at a minimum:

- Sample identification
- Date/time of sample collection
- Sampler's initials
- Required analyses
- Type of preservative.

All labels will be completed in waterproof ink. An example of a sample label is included in Appendix C.

2.3.1.3 Field Sample Handling

The possession and handling of samples will be documented from the time of collection to delivery to the laboratory. BCA field personnel are responsible for ensuring that chain-of-custody (COC) procedures are followed. Field personnel will maintain custody of all samples until they are relinquished to another custodian, the laboratory, or to the freight shipper.

All samples must be catalogued on a COC form using sample identification codes. A copy of the form is included in Appendix C. The date and time of collection will be recorded on the form, as well as the number of each type of sample, the method of preservation, and the type of analysis. The chain-of-custody SOP is located in Appendix D.

4.2.3.1 Field Sample Packaging and Shipping

Samples will be packaged and transported in a manner that maintains the integrity of the sample and permits the analysis to be performed within the prescribed holding time. Prior to shipment, each sample container will be inspected for a label with the proper sample identification code.

Samples will be either couriered or shipped via overnight mail to laboratory. The laboratory will be contacted in advance to expect shipment so that holding times of the samples will be conserved. The COC forms will be sealed in a plastic bag and transported inside the sample cooler. In addition, any shipping receipts will be incorporated into the COC documentation. Samples will be packed in the cooler using bubble-wrap packing materials and ice will be sealed in a Ziploc®-type bag. Any samples suspected of being highly contaminated will additionally be sealed in a Ziploc®-type bag. The cooler will be taped closed to prevent tampering during shipping. Upon relinquishing the sample cooler to the laboratory field personnel will sign custody of the samples over to the laboratory by signing and dating the bottom of the COC form. One copy of the COC documentation will be retained by the project manager and a second copy will be retained by the laboratory. In addition, the shipping label will be included with the COC form retained by the project manager.

2.3.1.5 Field Documentation

Field COC procedures will ensure the proper documentation of each sample from collection in the field to delivery at the laboratory. Custody of samples shall be maintained and documented at all times. The documentation for each sample will include the following information:

- COC form
- Sample label with sample identification code
- Shipping documents

This documentation will allow for proper identification and verification of all samples upon arrival at the laboratory.

2.3.2 Laboratory Chain of Custody

The laboratory will perform laboratory custody procedures for sample receiving and log-in, sample storage, tracking during sample preparation and analysis, and storage of data in accordance with their SOPs. The laboratory project manager will be responsible for ensuring that laboratory custody protocol is maintained. The laboratory's SOP for sample custody is presented in the Laboratory QA Manual (Appendix B).

2.3.3 Final Evidence Files Custody Procedure

BCA will be responsible for the custody of the evidence files and maintain and update the contents of the files during the project. The evidence files will include all records relevant to sampling and analysis activities such as boring logs, field books, photographs, subcontractor reports, laboratory data deliverables, COC forms, and data reviews. BCA will retain this file after completion of the project.

2.4 Quality Control Requirements

The quality control requirements ensure that the environmental data collected is of the highest standard feasible as appropriate for the intended application. Facets of the quality control requirements are provided in the following sections.

2.4.1 Field Quality Control Requirements

Where applicable, QC checks will be strictly followed during the assessment through the use of replicate measurements, equipment calibration checks, and data verification by BCA field personnel. Field-sampling precision and data quality will be evaluated through the use of sample duplicates, equipment blanks, and trip blanks. Sample duplicates provide precision information regarding homogeneity, handling, transportation, storage, and analysis. Equipment blanks will be used to ensure that proper decontamination procedures have been performed and that no cross contamination has occurred during sampling or transportation. Trip blanks will be used with VOCs only, to ensure that transportation of samples has not contaminated the samples. If there is any discrepancy in the sample data, the BCA project manager will be notified and, if deemed necessary, resampling of the questionable point scheduled. Requirements for field QA/QC samples are listed in Table 4. QA/QC sample quantities are also identified in the property-specific SAPs.

2.4.2 Laboratory QC Requirements

The laboratory QA manager will be responsible for ensuring that the laboratory's data precision and accuracy are maintained in accordance with specifications. Internal laboratory duplicates and calibration checks are performed on one of every 20 samples submitted for analysis. Other internal laboratory QA/QC is performed according to laboratory SOP. Soil samples that are submitted for laboratory MS/MSD or spike and duplicate analyses will have an additional set of samples collected from the sample locations. In the case of VOCs, double the amount will be collected. Typically laboratories require two to three sample containers for each sample location, therefore, four to six sample containers will be collected for laboratory MS/MSD analyses (i.e., six TerraCore® sample tubes will be collected). If soil VOCs are preserved in the field with methanol, additional sample volume is not required for the MS/MSD analyses.

2.5 Instrument Calibration and Frequency

The calibration procedures to be employed for both the field and laboratory instruments used during the project are referenced in this section. Measuring and test equipment used in the field and laboratory will be subjected to a formal calibration program. The program will require equipment of the proper type, range, accuracy, and precision to provide data compatible with the specified requirements and the desired results. Calibration of measuring and test equipment may be performed internally using in-house reference standards, or externally by agencies or manufacturers.

The responsibility for the calibration of laboratory equipment rests with the laboratory. Field personnel are responsible for the calibration of field equipment and field equipment provided by subcontractors.

Documented and approved procedures will be used for calibrating measuring and testing equipment. Widely accepted procedures, such as those published by U.S. EPA and

American Society for Testing and Materials (ASTM), or procedures provided by manufacturers in equipment manuals will be adopted.

Calibrated equipment will be uniquely identified by the manufacturer's serial number, a BCA equipment identification number, or by other means. This identification, along with a label indicating when the next calibration is due (only for equipment not requiring daily calibration), will be attached to the equipment. If this is not possible, records traceable to the equipment will be readily available for reference. It will be the responsibility of all equipment operators to check the calibration status from the due date labels or records prior to using the equipment.

Measuring and testing equipment will be calibrated at prescribed intervals and/or as part of operational use. Frequency will be based on the type of equipment, inherent stability, manufacturer's recommendations, values given in national standards, intended use, and experience. Equipment will be calibrated whenever possible using reference standards having known relationships to nationally recognized standards or accepted values of physical constants. If national standards do not exist, the basis for calibration will be documented.

Physical and chemical reference standards will be used only for calibration. Equipment that fails calibration or becomes inoperable during use will be removed from service, segregated to prevent inadvertent use, and tagged to indicate the fault. Such equipment will be recalibrated and repaired to the satisfaction of the laboratory personnel or field personnel, as applicable. Equipment that cannot be repaired will be replaced.

Records will be prepared and maintained for each piece of calibrated measuring and test equipment to document that established calibration procedures have been followed. Records for field equipment used only for this specific project will be kept in the project files. The laboratory will maintain laboratory calibration records.

2.5.1 Field Instrument Calibration

Instruments used to gather, generate, or measure field environmental data will be calibrated with sufficient frequency and in such manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications. Field measurement instruments may include PID or FID units used to detect VOC vapors, pH meters, conductivity meters, and temperature probes. As applicable, field instruments will be calibrated daily prior to use. The calibration will be consistent with the standard procedure. The field calibration procedures are presented in the field SOPs located in Appendix D.

Calibration procedures will be documented in the field logbook and field sampling sheets. Documentation will include the following:

- Date and time of calibration
- Identity of the person performing the calibration
- Reference standard used, if applicable
- Reading taken and adjustments to attain proper reading
- Any corrective action.

Trained personnel will operate field measurement equipment in accordance with the appropriate standard procedures or manufacturer's specifications. Field technical staff members will examine field measurement equipment used during field sampling to verify that they are in operating condition. The field team leader will periodically audit the calibration and field performance of the field equipment to ensure that the system of field calibration meets the manufacturer's specifications.

2.5.2 Laboratory Instrument Calibration

The proper calibration of laboratory equipment is a key element in the quality of the analysis done by the laboratory. Each type of instrumentation and each U.S. EPA-approved method have specific requirements for the calibration procedures, depending on the analytes of interest and the sample medium.

The calibration procedures and frequencies of the equipment used to perform the analyses will be in accordance with requirements established by the U.S. EPA. The laboratory QA manager will be responsible for ensuring that the laboratory instrumentation is maintained in accordance with specifications. Individual laboratory SOPs will be followed for corrective actions and preventative maintenance frequencies. Laboratory quality control, calibration procedures, corrective action procedures and instrument preventive maintenance are discussed in laboratory QA Manual located in Appendix B.

2.6 Data Management

Field technical staff members will manage raw data during field activities. Data such as geologic profiles, pH readings, and pump test results will be recorded on the appropriate field forms (examples of which are located in Appendix C) or in field logbooks. The BCA project manager will periodically collect data gathered during assessment activities in order to maintain results. As appropriate, the BCA project manager will coordinate transfer of raw data to computer formats such as Microsoft® Excel or Microsoft® Access to better organize and track incoming data. This will enable the project manager to identify any data gaps. Any flaws in field QA/QC will be brought to the attention of the BCA QA manager.

The laboratory project manager will be responsible for laboratory data management. Laboratory procedures for data review and data reporting are discussed in the lab’s QA

Manual, located in Appendix B. Analytical data reports generated by the laboratory will present all sample results on a dry-weight basis, including all QA/QC samples. The data reports will include a laboratory narrative for the data set describing any out of control analyses and their effect on sample results, explanation of all lab applied qualifiers; all sample results including the % moisture content for soil samples, the method blank results, the calibration blank results, the spike and duplicate analysis results (or MS/MDS results) including the % recoveries and RPDs, the lab control sample (LCS) results including % recoveries, summaries of daily calibration check samples (including notation of any outliers), surrogate results including % recoveries (as applicable per analysis), etc. Soil results will be reported on a dry weight basis. All data, including QA/QC results, will become part of the project files and will be maintained by the BCA project manager. Upon report delivery, BCA personnel will analyze laboratory data in accordance with accepted statistical methodologies.

3.0 ASSESSMENT/OVERSIGHT

Performance and system audits will be completed to ensure that the field sampling activities and laboratory analyses are performed following the procedures established in this QAPP, including the attached SOPs, and the RWP. The audits may be both internally and externally led, as further described below.

3.1 Technical Systems Audits

Generally, system audits are a qualitative measure of adherence to sampling QA measures overall, including sample collection handling, decontamination procedures, COC, and recording requirements in the field, as well as sample receiving, log-in, and instrument operating records in the laboratory.

3.1.1 Field Data

A geologist will be present at the site during sampling activities. The geologist will provide the on-site supervision required during the project. The geologist will be in daily contact with the project manager, who will then review compliance with the project objectives and sampling protocol outlined in this QAPP. Any anticipated modifications to the sampling or measuring procedures will be reported to the City Brownfield Coordinator and IDEM project manager. Field technical staff members will report modifications to the project manager, and document the modification in the field logbook.

Sample data precision will be determined by the collection and subsequent analysis of sample duplicates, equipment blanks, and trip blanks to verify reproducibility.

3.1.2 Field Screening Instruments

Field technical staff members will audit and maintain the performance of field-screening instruments. Instruments will be calibrated according to the standard procedures located in Appendix D, and regular preventative maintenance will be performed as described in Table 6 (located at the end of the QAPP).

3.1.3 Report Preparation

Prior to submittal to Logansport and IDEM, all reports will undergo a review conducted by the BCA QA manager. All components of the report will be checked. Logansport may also review reports prior to submittal to IDEM.

3.1.4 Laboratory Data

Laboratory results will be reviewed for compliance against the DQO criteria for the level of reporting required.

3.2 Performance Evaluation Audits

Generally, performance audits are a quantitative measure of field sample collection and laboratory analyses quality.

3.2.1 Field Audits

The BCA QA manager may conduct audits of field activities. IDEM may also conduct an independent field audit. A field audit may be conducted near the beginning of the sample collection activities. A typical field audit may include the following checklist:

Item	Description of Field Audit Activities	QA Manager Initials
1.	Review of field-sampling records	
2.	Review of field-measurement procedures	
3.	Examination of the application of sample identifications following the specified protocol	
4.	Review of field instrument calibration records and procedures	
5.	Recalibration of field instruments to verify calibration to the manufacturer's specifications	
6.	Review of the sample handling and packaging procedures	
7.	Review of COC procedures	

If deficiencies are observed during the audit, the deficiency shall be noted in writing and a follow-up audit may be completed if deemed necessary by the project QA manager. Corrective action procedures may need to be implemented due to the findings from the audit. Such actions will be documented in the field logbook.

3.2.2 Laboratory Audits

As discussed in Section 1.4.1.2, the laboratories are NELAP-certified, and a copy of their NELAP certificate is located in Appendix A. The primary contracted laboratory will be responsible for all analytical work for this project using SW-846 methods. The laboratory QA manager will be responsible for ensuring that the laboratory data precision and accuracy are maintained in accordance with specifications and laboratory SOPs. NELAP-certified labs are routinely audited by the State of Illinois or NELAP.

3.3 Reports to Management

For the duration of the project, informal monthly reports will be prepared by the project manager and submitted to the City of Logansport and IDEM, as needed. These reports will serve to inform Logansport and IDEM of the project progress and any significant interim findings that have been identified. This will streamline the process of addressing issues as they arise and adjusting the project to better define the environmental concerns. At the completion of the remediation, draft and final project reports will be issued, if requested.

4.0 DATA VALIDATION/USABILITY

This section describes the QA activities that will be performed to ensure that the collected data are scientifically defensible, properly documented, and of known quality, and meet project objectives. All analytical data collected for the former Exide Site will be validated.

The following three steps will be followed to ensure that project data quality needs are met.

1. **Data Verification** – Data verification is a process of evaluating the completeness, correctness, and contractual compliance of a data set against the method standard, SOP, or contract requirements. Data verification will be performed internally by the analytical group or laboratory generating the data. Additionally, data may be checked by an entity external to the analytical group or fixed laboratory. Data verification may result in accepted, qualified, or rejected data.

2. **Data Validation** – Data validation is an analyte- and sample-specific process that extends the qualification of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of specific data sets. Data validation criteria are based on the measurement performance criteria of the project QAPP. IDEM will perform data validation on the closure samples. Data validation results are accepted, qualified, or rejected data.

3. **Data Usability Assessment** – Data usability assessment is the process of evaluating validated data to determine if the data can be used for purpose of the project (i.e., to answer the environmental questions or to make environmental decisions). Data usability will include the following sequence of evaluation:

- First, individual data sets will be evaluated to identify the measurement performance/usability issues or problems affecting the ultimate achievement of project DQOs.
- Second, an overall evaluation of all data generated for the project will be performed.
- Finally, the project-specific measurement performance criteria and data validation criteria will be evaluated to determine if they were appropriate for meeting project DQOs.

In order to perform the data evaluation steps above, the reported data will be supported by complete data packages which include sample receipt and tracking information, COC records, tabulated data summary forms, and raw analytical data for all field samples, standards, QC checks and QC samples, and all other project-specific documents that are generated.

4.1 Instructions for Data Review, Validation, and Verification Requirements

This section describes the process for documenting the degree to which the collected data meet the project objectives, individually and collectively. BCA will estimate the potential effect that each deviation from this QAPP may have on the usability of associated data items, its contribution to the quality of reduced and analyzed data, and its effects on the decision.

The following procedures will be implemented to verify and validate data collected during the project:

- *Sampling Design* – How closely a measurement represents the actual environment at a given time and location is a complex issue. Each sample will be checked for compliance with the specifications, including type and location. BCA will note deviations from the specifications, and discuss them with the IDEM project manager.

- *Sample Collection Procedures* – Sample collection procedures identified in this QAPP will be followed. If field conditions require deviations, they will be discussed with the IDEM project manager.

- *Sample Handling* – Deviations from the planned sample handling procedures will be noted in the field logbooks. Data collection activities will indicate the events that occur during sample handling affecting the integrity of the samples.

  BCA field technical staff members will evaluate the sample containers and the preservation methods used and ensure that they are appropriate to the nature of the sample and the type of data generated from the sample. Checks on the identity of the sample will be made to ensure that the sample continues to be representative of its native environment as it moves through the analytical process.

- *Analytical Procedures* – Each sample will be verified to ensure that the procedures used to generate the data were implemented as specified. Data validation activities will be used to determine how seriously a sample deviated beyond the acceptance limit so that the potential effects of the deviation can be evaluated.

- *Quality Control* – QC checks that are to be performed during sample collection, handling, and analysis are specified in an earlier section of this QAPP. For each specified QC check, the procedures, acceptance criteria, and corrective action should be specified. During data validation, the corrective actions that were taken, which samples were affected, and the potential effect of the actions on the validity of the data will be documented.

- *Calibration* – Field and laboratory instrument calibrations will be documented to ensure that calibrations:

  - Were performed within an acceptance time prior to generation of measurement data;
  - Were performed in proper sequence;
  - Included the proper number of calibration points;
  - Were performed using a standard that bracketed the range of reported measurement results; and
  - Had acceptable linearity checks and other checks to ensure that the measurement system was stable when calibration was performed.

  When calibration problems are identified, any data produced between the suspect calibration event and any subsequent recalibration will be flagged to alert data users.

- *Data Reduction and Processing* – Checks on data integrity will be performed to evaluate the accuracy of raw data and include the comparison of important events and duplicate rekeying of data to identify data entry errors. The laboratory QA Manual (Appendix B) discusses their data reduction procedures.

4.2 Instructions for Validation and Verification Methods

This section describes the process that will be followed to verify and validate the project data.

4.2.1 Verification

Field data will be verified by the BCA QA manager by reviewing field documentation and chain-of-custody records. Data from direct-reading instruments used to measure conductivity, DO, and turbidity will be internally verified by reviewing calibration and operating records. The laboratory data will be verified in respect to the COC, units of measure, and citation of analytical methods. Data verification procedures followed by the laboratory are discussed in the laboratory's QA Manual (Appendix B), and will include reviewing and documenting sample receipt, sample preparation, sample analysis (including internal QC checks), data reduction, and reporting. Any deviations from the acceptance criteria corrective actions taken, and data determined to be of limited usability (i.e., laboratory-qualified data) will be noted in the case narrative of the laboratory report. The QA manager will also verify the use of blanks and duplicates. All applicable reference and identification codes and numbers will be reviewed as part of the documentation.

4.2.2 Validation

Data validation will be conducted consistent with the procedure identified in Section 1.5 of this QAPP. The data verification/validation procedure will identify data as being acceptable, of limited usability qualified or estimated, or rejected. The conditions that result in data being qualified or estimated or rejected are identified in Section 1.5 of this QAPP. The results of the data verification/validation will be provided to BCA's Project Manager. The validation procedure will specify the verification process of every quality control measure used in the field and laboratory. Data validation procedures followed by the laboratory are discussed in the laboratory QA Manual (Appendix B).

Each analytical report will be reviewed for compliance with the applicable method and for the quality of the data reported.

Data determined to be unusable may require that corrective action be taken. Potential types of corrective action may include re-sampling by the field team or re-analysis of the samples by the laboratory. The corrective actions taken are dependant upon the ability to mobilize the field team and whether the data are critical for the project DQOs to be achieved. Should BCA's QA Manager identify a situation requiring corrective action during data verification/validation, the Project Manager will be responsible for approving the implementation of the corrective action.

4.3 Instructions for Reconciliation with Data Quality Objectives

This section describes the scientific and statistical procedures/methods that will be used to determine whether data are of the right type, quality, and quantity to support environmental decision making for the project.

The Data Quality Assessment (DQA) process is described in *Guidance for the Data Quality Assessment Process: Practical Methods for Data Analysis*, EPA QA/G-9, July 1996. The DQA process will consist of five steps:

1. Review DQOs and sampling design
2. Conduct preliminary data review
3. Select statistical test
4. Verify assumptions
5. Draw conclusions from the data.

While the formal DQA process presented in the guidance may not be followed in its entirety, an assessment of the data quality will be performed. This process will include a preliminary data review. Data will be presented in tables and figures to identify the trends, relationships, and anomalies.

The overall usability of the data for the project will be assessed by evaluating the PARCCS of the data set to the measurement performance criteria in Section 1.5 of this QAPP using statistical quantities as applicable. The procedures and statistical formulas to be used for these evaluations are presented in the following sections.

4.3.1 Precision

In order to meet the needs of the project, data must meet the measurement performance criteria for precision. Project precision will be evaluated by assessing the RPD data from the field duplicate samples. Analytical precision will be evaluated by assessing the RPD data from either duplicate spiked sample analyses or duplicate sample analyses. The RPD between two measurements is calculated using the following simplified formula:

$$\text{RPD} = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \quad \text{X} \quad 100$$

where: R_1 = value of first result

R_2 = value of second result.

Overall precision for the sampling programs will be determined by calculating the mean RPD for all field duplicates in a given sampling program. This will provide an evaluation of the overall variability attributable to the sampling procedure, sample matrix, and laboratory procedures in each sampling program.

The overall precision requirement will be the same as the project precision. It should be noted that the RPD of two measurements can be very high when the data approach the quantitation limit of an analysis. The calculation of the mean RPD will include only the RPD values for field duplicate sample analyte data that are greater than or equal to five times the quantitation limit for an analysis.

Poor overall precision may be the result of one or more of the following:

- Field instrument variation
- Analytical measurement variation
- Poor sampling technique
- Sample transport problems
- Heterogeneous matrices.

In order to identify the cause of the imprecision, the field-sampling design rationale and sampling techniques should be evaluated by the reviewer, and both field and analytical duplicate/replicate sample results should be reviewed. If poor precision is indicated in both the field and analytical duplicates/replicates, then the laboratory may be the source of error. If poor precision is limited to the field duplicate/replicate results, then the sampling technique, field instrument variation, sample transport, or heterogeneous sample matrices may be the source of error.

If the Data Validation indicates that analytical imprecision exists for a particular data set, then the impact of that imprecision on data usability must be considered. It should be noted that the Data Validation Report is considered to be the QA/QC report supplied by the analytical laboratory while the IDEM conducts 3rd party data validation on the sampling/analysis of the closure samples. When project-required precision is not achieved and project data are not usable to adequately address environmental questions and to support project decision making, then the problem will be discussed with the IDEM project manager and re-sampling conducted, if appropriate.

4.3.2 Accuracy/Bias

In order to meet the needs of the data users, project data will follow the measurement performance criteria for accuracy/bias established in Section 1.5.2.

4.3.2.1 Sample Contamination

QC check samples data will be reviewed to evaluate the accuracy and potential bias of sample results. If field contamination exists, then the impact of field contamination on data usability will be evaluated, and the BCA project manager and field team leader should be notified. Differentiate field sample collection and transport contamination from contamination introduced at the time of sample preparation and analysis. Note that sample contamination may result in either negative or positive bias. For example, improperly cleaned sample containers for metals analysis may result in the retention of metals on interior container walls. This would result in lower metals concentrations being reported than are actually present in the environmental sample, which is a negative bias. A positive bias would occur when sample container contamination results in an additive effect, meaning that reported analyte concentrations are higher than the true sample concentrations for that analyte.

4.3.2.2 Analytical Accuracy/Bias

The data from method/preparation blank samples, field blank samples, trip blank sample, surrogate spikes, MS/MSD samples, and LCSs will be used to determine accuracy and potential bias of the sample data. If the Data Validation Reports indicate that contamination and/or analytical inaccuracies/bias exist for a particular data set, then the impact of that contamination and/or analytical inaccuracies/bias on data usability will be discussed with the IDEM Project manager and re-sampling considered, if appropriate.

4.3.2.3 Overall Accuracy/Bias

The data from the method/preparation blank samples provide an indication of laboratory contamination that may result in bias of sample data. Sample data associated with method/preparation blank contamination will have been identified during the data verification/validation process. Sample data associated with method/preparation blank contamination are evaluated during data validation procedure to determine if analytes detected in the samples and the associated method/preparation blanks are "real" or are the result of laboratory contamination. The procedure for this evaluation involves comparing the concentration of the analyte in the sample to the concentration of the method/preparation blank taking into account adjustments for sample dilution and dry-weight reporting. In general, the sample data are qualified as not detected if the sample concentration is less than five times (ten times for common laboratory contaminants) the method/preparation blank concentration. Typically, the common quantitation limit for the affected analyte is elevated to the concentration detected in the sample.

The data from the field blanks and trip blanks provide an indication of field and transportation conditions that may result in bias of sample data. Sample data associated with contaminated field and trip blank samples have been identified during the data verification/validation process. The evaluation procedure and qualification of sample data associated with field blank and trip blank contamination is performed in the same manner as the evaluation procedure for method blank sample contamination, taking into account the difference in units for aqueous field blank samples collected during soil sampling programs.

Surrogate spike recoveries provide information regarding the accuracy/bias of the organic analyses on an individual sample basis. Surrogate compounds are not expected to be found in the samples and are added to every sample prior to sample preparation/ purging. The percent recovery data provide an indication of the effect that the sample matrix may have on the preparation and analysis procedure. Sample data exhibiting matrix effects will have been identified during data verification/validation process.

Matrix spike sample data can provide information regarding the accuracy/bias of the analytical methods relative to the sample matrix. Matrix spike samples are field samples that have been fortified with target analytes prior to sample preparation and analysis. The percent recovery data provide an indication of the effect that the sample matrix may have on the preparation and analysis procedure. Sample data exhibiting matrix effects will have been identified during data verification/validation process.

Analytical accuracy/bias will be determined by evaluating the percent recovery data of LCSs. LCSs are artificial samples prepared in the laboratory using a blank matrix that is fortified with analytes from a standard reference material that is independent of the calibration standards. LCSs are prepared and analyzed in the same manner as the field samples. The data from LCS analyses will provide an indication of the accuracy and bias of the analytical method for each target analyte.

Percent recovery is calculated using the following formula:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where: SSR = Spiked Sample Result

SR = Sample Result or Background

SA = Spike Added.

The percent recovery of LCSs is determined by dividing the measured value by the true value and multiplying by 100.

Overall accuracy/bias for the sampling events will be determined by calculating the percent accuracy measurements that meet the measurement performance criteria specified in Section 1.5.2 of this QAPP. Overall accuracy will be considered acceptable if the surrogate percent recoveries are met for at least 75 percent of the samples and the LCS percent recoveries are met for all samples and the MS/MSD percent recoveries are met for at least 75 percent of the samples.

The Closure Report will discuss and compare overall contamination and accuracy/bias data from multiple data sets collected for the project for each matrix, analytical parameter, and concentration level. The report will describe the limitations on the use of the project data if extensive contamination and/or inaccuracy/bias exists or when it is limited to a specific sampling or laboratory analytical group, data set, analytical parameter, or concentration level. The Report will identify qualitative and/or quantitative bias trends in multiple performance evaluation (PE) sample results for each matrix, analytical parameter, and concentration level. The impact of any qualitative and/or quantitative trends in bias on the sample data will be discussed. Any PE samples that have false positive and/or false negative results should be reported and the impact on data usability will be discussed.

When project-required accuracy/bias is not achieved and project data are not usable to adequately address environmental questions and to support project decision making, then the project manager will address with the IDEM project Manager how this problem will be resolved and the potential need for resampling.

4.3.3 Sample Representativeness

In order to meet the needs of the data users, project data must meet the measurement performance criteria to sample representativeness specified in Section 1.5.3.

Representativeness of the samples will be assessed by reviewing the results of field audits and the data from field duplicate samples. If field duplicate precision checks indicate potential spatial variability, then this may trigger additional scoping meetings and subsequent resampling in order to collect data that are more representative of a nonhomogeneous site. Overall sample representativeness will be determined by calculating the percent of field duplicate sample data that achieved the RPD criteria specified in Section 1.5.3 of this QAPP. Overall sample representativeness will be considered acceptable if the results of the field audits indicate that the approved sampling methods or alternate acceptable sampling methods were used to collect the samples, and the field duplicates RPD data are acceptable for at least 75 percent of the samples.

The QA manager will compare overall representativeness for each matrix, parameter, and concentration level. The report will describe the limitations on the use of project data when overall non-representative sampling has occurred or when non-representative sampling is limited to a specific sampling group, data set, matrix, analytical parameter, or concentration level. If data are not usable to adequately address environmental questions and/or support project decision making, then the project manager will address how this problem will be resolved and discuss potential need for re-sampling.

4.3.4 Sensitivity and Quantitation Limits

In order to meet the needs of the data user, project data must meet the measurement performance criteria for sensitivity as specified. Low point calibration standards should produce a signal at least ten times the background noise levels and should be part of a linear calibration curve. Document the procedures for calculating method detection limits (MDLs) and quantitation limits (QLs).

4.3.4.1 Overall Sensitivity and Quantitation Limits

The quantitation limits for the sample data will be reviewed to ensure that the sensitivity of the analyses was sufficient to achieve IDEM RbCG standards. The method/preparation blank sample data and LCSs percent recovery data will be reviewed to assess compliance with the measurement performance criteria specified in Section 1.5.6 of this QAPP.

Overall sensitivity will be assessed by comparing the sensitivity for each monitoring program to the detectability requirements for the analyses. Overall sensitivity will be considered acceptable if quantitation limits for samples are less than the acceptable evaluation criteria (i.e., RbCG standards).

It should be noted that quantitation limits may be elevated as a result of high concentrations of target compounds, nontarget compounds, and matrix interferences (collectively known as sample matrix effects). In these cases, the sensitivity of the analyses will be evaluated on an individual sample basis relative to the applicable evaluation criteria. The need to investigate the use of alternate analytical methods may be required if the sensitivity of the analytical methods identified in this QAPP cannot achieve the evaluation criteria because of sample matrix interference.

If Data Validation Reports indicate that sensitivity and/or QLs were not achieved, then the impact of that lack of sensitivity and/or higher QLs on data usability will be discussed with the IDEM project manger.

The QA Manager will compare overall sensitivity and QLs from multiple data sets collected for the project for each matrix, analytical parameter, and concentration level. The Closure Report will describe the limitations on the use of the project data if project-required sensitivity and QLs were not achieved for all project data or when it is limited to a specific sampling or laboratory/analytical group, data set, matrix, analytical parameter, or concentration level.

When project-related QLs are not achieved and project data are not usable to adequately address environmental questions and to support project decision making, then the Project manger will address how this problem will be resolved and discuss the potential need for resampling. In this case, the report will clearly differentiate between usable and unusable data for the users.

4.3.5 Completeness

In order to meet the needs of the data users, project data will follow the measurement performance criteria for data completeness outlined in Section 1.5.4.

4.3.5.1 Overall Completeness

Completeness will be assessed by comparing the number of valid (usable) sample results to the total possible number of results within a specific sample matrix and/or analysis. Percent completeness will be calculated using the following formula:

$$\%\ \text{Completeness} = \frac{\text{Number of Valid (usable) measurements}}{\text{Number of Measurements Planned}} \times 100$$

Overall completeness will be assessed by calculating the mean percent completeness for the entire set of data obtained for each sampling program. The overall completeness for the Phase II will be calculated when all sampling and analysis is concluded. Overall completeness will be considered acceptable if at least 90 percent of the data are determined to be valid.

The report will discuss and compare overall completeness of multiple data sets collected for the project for each matrix, analytical parameter, and concentration level. The Closure Report will describe the limitation on the use of the project data if project-required completeness was not achieved for the overall project or when it is limited to a specific sampling or laboratory/analytical group, data set, analytical parameter, or concentration level.

When project-required completeness is not achieved and sufficient data are not available to adequately address environmental questions and support project decision making, then the Project Manager will address with the IDEM Project manager how this problem will be resolved and discuss the potential need for additional re-sampling.

4.3.6 Comparability

In order to meet the needs of the data users, project data will follow the measurement performance criteria for comparability outlined in Section 1.5.5.

The comparability of data sets will be evaluated by reviewing the sampling and analysis methods used to generate the data for each data set. Project comparability will be determined to be acceptable if the sampling and analysis methods specified in this QAPP and any approved QAPP revisions or amendments are used for generating the soil, groundwater, sediment, and surface water data.

The QA manager will compare overall comparability between multiple data sets collected for the project for each matrix, analytical parameter, and concentration level. The report will describe the limitation on the use of project data when project-required data comparability is not achieved for the overall project or when it is limited to a specific sampling or laboratory/analytical group, data set, matrix, analytical parameter, or concentration level.

For long-term monitoring projects, data comparability is extremely important. Project data will be compared to previously generated data to determine the possibility of false positives and/or false negatives. Variations detected in the data may reflect a changing environment or indicate sampling and/or analytical error. Comparability criteria will be established to evaluate these data sets in order to identify statistical outliers to trigger re-sampling as verified.

If it is determined that long-term monitoring data are not comparable, the project manager will address whether the data indicate a changing environment or the anomalies are a result of sampling and/or analytical error. If data are not usable to adequately address environmental questions and/or support project decision making, then the report will address how this problem will be resolved.

Overall comparability of data from spilt samples (samples that are collected at the same time from the same location and split equally between two parties using sample containers from the same source or vendor) will be evaluated by determining the RPD of detected analytes in both samples following data verification/validation. Analytes that are detected in only one of the two samples will be assessed by reviewing the data verification/validation reports for both data sets and determining the cause of the discrepancy. Overall comparability of split sample data will be considered acceptable if the RPD for detected analytes with concentrations greater than or equal to five times their respective quantitation limits does not exceed RPD acceptance criteria for field duplicate samples.

If screen/confirmatory comparability criteria are not met, then this will be documented and the effect on data usability will be discussed. If oversight split-sampling comparability criteria are not met, then this will be documented and the effect on data usability will be discussed. If data are not usable to adequately address environmental questions and/or support project decision making, then the project manger will address how this problem will be resolved and discuss potential need for resampling.

4.3.7 Data Limitations and Actions

Sources of sampling and analytical error will be identified and corrected as early as possible to the onset of sample collection activities. An ongoing data assessment process will be incorporated during the project, rather than just as a final step, to facilitate the early detection and correction of problems, ensuring that project quality objectives are met.

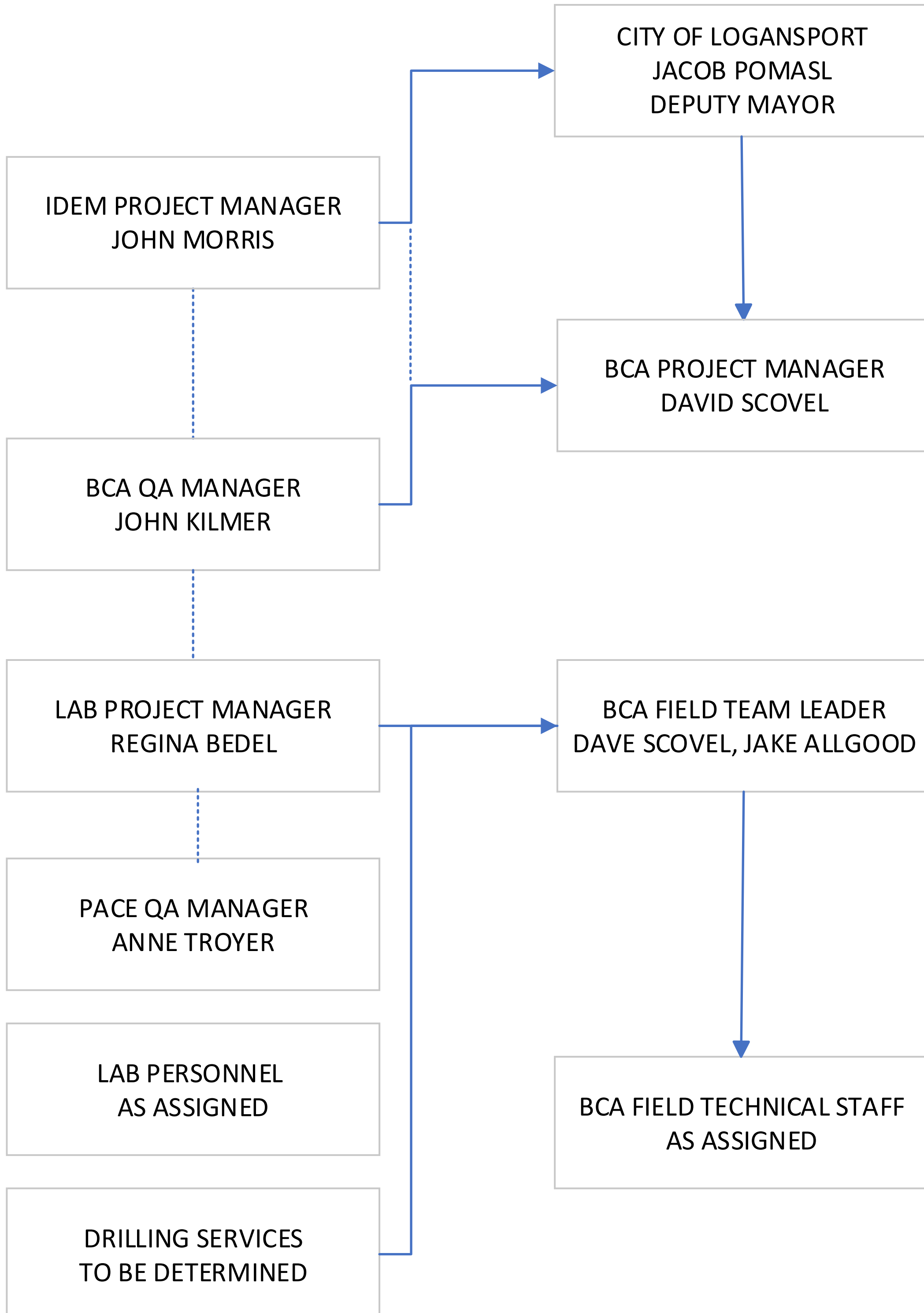
Data that do not meet the measurement performance criteria specified in this QAPP will be identified and the impact on the project quality objectives will be assessed and discussed within the Closure Report. Specific actions for data that do not meet the measurement performance criteria depend on the use of the data and may require that additional samples are collected or the use of the data to be restricted.

5.0 REFERENCES

United States Environmental Protection Agency. 1993. *Data Quality Objectives Process for Superfund: Interim Final Guidance*. EPA 540-R-93-071, Office of Research and Development, Washington DC.

United States Environmental Protection Agency. 1994. *Guidance for Data Quality Assessments*. EPA QA/G-5, Office of Research and Development, Washington DC.

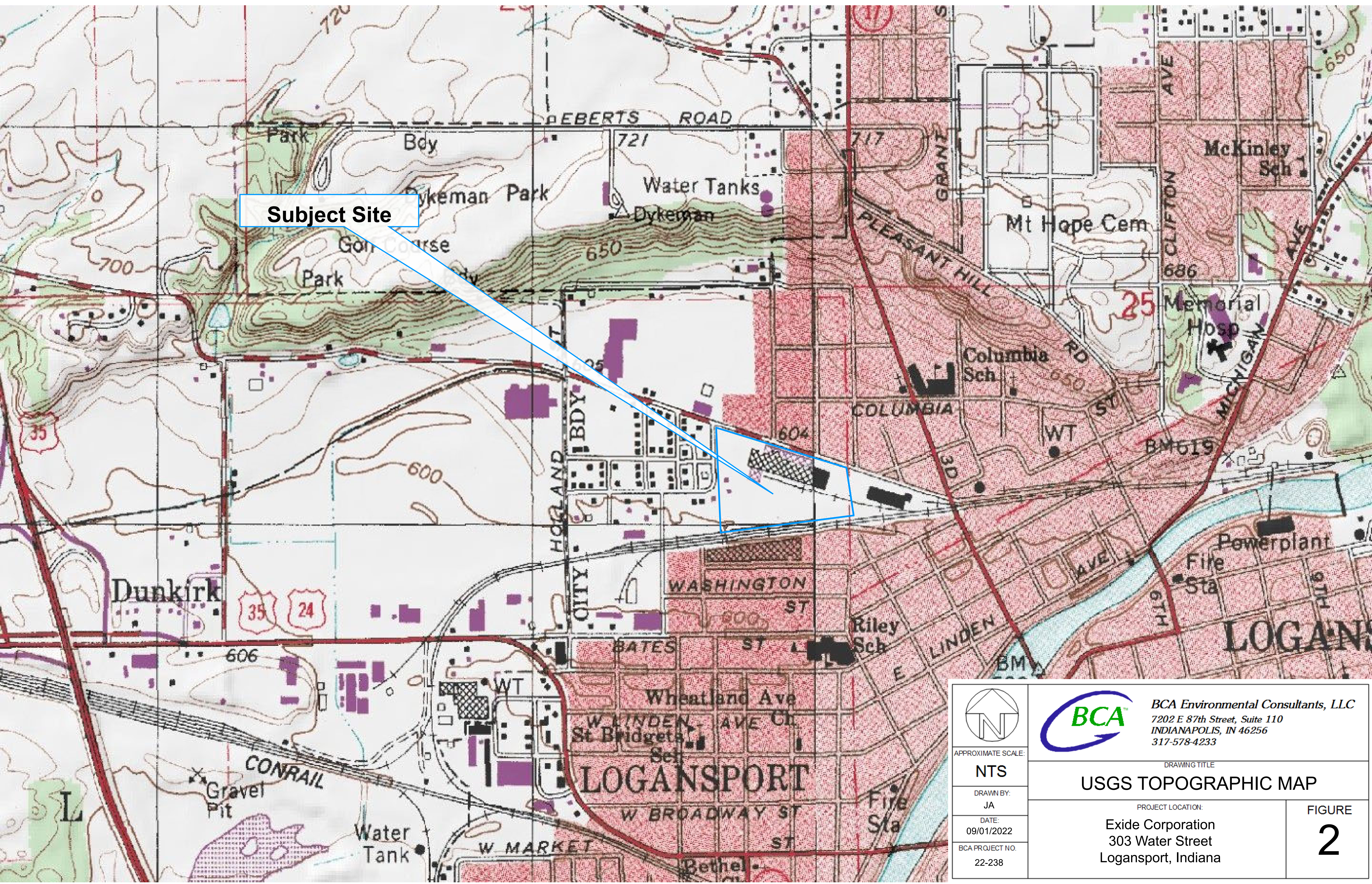
United States Environmental Protection Agency. 1996. *Guidance for the Data Quality Assessment Process: Practical Methods for Data Analysis*. EPA QA/G-9, Office of Research and Development, Washington DC.



CITY OF LOGANSPORT, INDIANA
FORMER EXIDE BATTERY

FIGURE 1
PROJECT ORGANIZATION CHART

BCA ENVIRONMENTAL CONSULTANTS, LLC
DECEMBER 2022



APPROXIMATE SCALE: NTS

DRAWN BY: JA

DATE: 09/01/2022

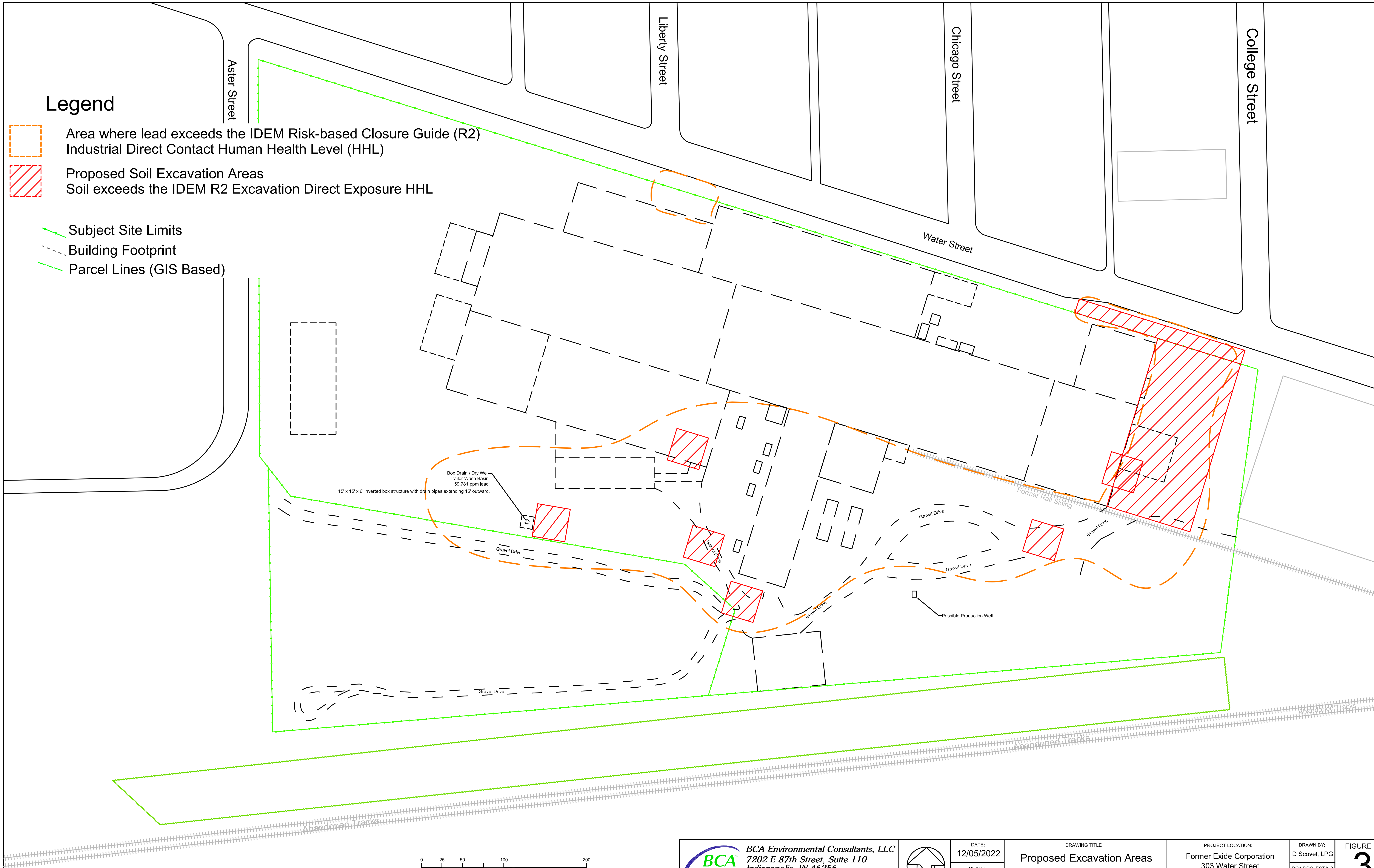
BCA PROJECT NO. 22-238

BCA Environmental Consultants, LLC
7202 E 87th Street, Suite 110
INDIANAPOLIS, IN 46256
317-578-4233

DRAWING TITLE
USGS TOPOGRAPHIC MAP

PROJECT LOCATION:
Exide Corporation
303 Water Street
Logansport, Indiana

FIGURE 2



BCA Environmental Consultants, LLC 7202 E 87th Street, Suite 110 Indianapolis, IN 46256 317-578-4233	N	DATE: 12/05/2022 SCALE: 1" = 100'	DRAWING TITLE Proposed Excavation Areas	PROJECT LOCATION: Former Exide Corporation 303 Water Street Logansport, Indiana	DRAWN BY: D Scovel, LPG BCA PROJECT NO. 22-140	FIGURE 3

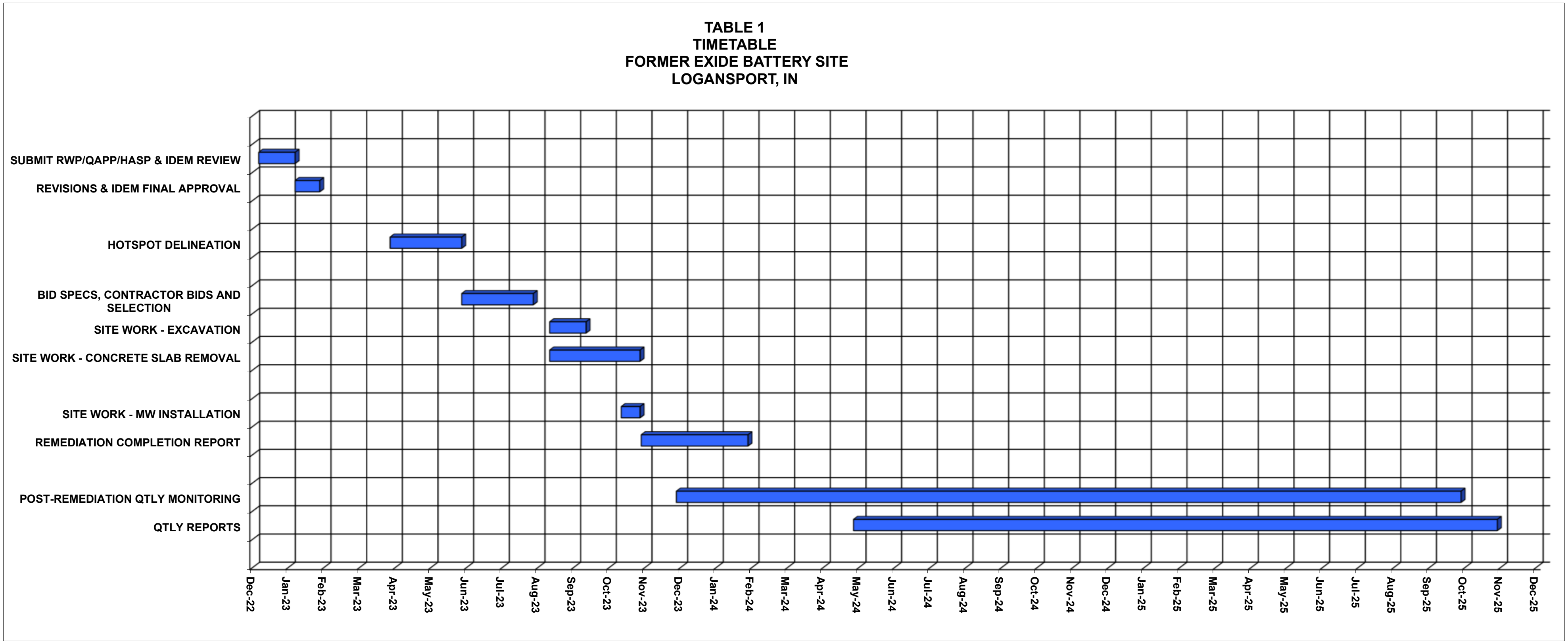


TABLE 1
TIMETABLE
FORMER EXIDE BATTERY SITE
LOGANSPORT, IN
SUBMIT RWP/QAPP/HASP & IDEM REVIEW
REVISIONS & IDEM FINAL APPROVAL
HOTSPOT DELINEATION
BID SPECS, CONTRACTOR BIDS AND SELECTION
SITE WORK - EXCAVATION
SITE WORK - CONCRETE SLAB REMOVAL
SITE WORK - MW INSTALLATION
REMEDIATION COMPLETION REPORT
POST-REMEDIATION QTLY MONITORING
QTLY REPORTS
Dec-22 Jan-23 Feb-23 Mar-23 Apr-23 May-23 Jun-23 Jul-23 Aug-23 Sep-23 Oct-23 Nov-23 Dec-23 Jan-24 Feb-24 Mar-24 Apr-24 May-24 Jun-24 Jul-24 Aug-24 Sep-24 Oct-24 Nov-24 Dec-24 Jan-25 Feb-25 Mar-25 Apr-25 May-25 Jun-25 Jul-25 Aug-25 Sep-25 Oct-25 Nov-25 Dec-25

Table 2

Laboratory Analyses to be Performed,

(Waters and Soils, unless otherwise noted)

Former Exide Battery Site

Logansport, Indiana

LABORATORY	ANALYSES TO BE PERFORMED
PACE – Indianapolis, IN (NELAP Cert Exp 04-30-23)	VOCs (8260).
	Metals - Lead (6010B).
	% moisture (SM 2540G)

TABLE 3
Laboratory Precision and Accuracy Limits
PACE Laboratories - Indianapolis
SW-846 Methods 6010/7470/7471 Metals - Soil
Former Exide Battery Site
Logansport, Indiana

Target Analyte	CAS Number	Method	RL mg/Kg	MDL mg/Kg	2022 RCG R2 SOIL Res. Limit mg/Kg	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
Metals in Soil by ICP/CVAA								
Aluminum	7429-90-5	6010B	50	1.31	100000	80-120	75-125	20
Antimony	7440-36-0	6010B	1	0.21	40	80-120	75-125	20
Arsenic	7440-38-2	6010B	1	0.21	10	80-120	75-125	20
Barium	7440-39-3	6010B	1	0.04	20000	80-120	75-125	20
Beryllium	7440-41-7	6010B	0.5	0.01	200	80-120	75-125	20
Boron	7440-42-8	6010B	5	0.4	20000	80-120	75-125	20
Cadmium	7440-43-9	6010B	0.5	0.02	10	80-120	75-125	20
Calcium	7440-70-2	6010B	50	6.63	NA	80-120	75-125	20
Chromium	7440-47-3	6010B	1	0.1	NA	80-120	75-125	20
Cobalt	7440-48-4	6010B	1	0.03	30	80-120	75-125	20
Copper	7440-50-8	6010B	1	0.09	4000	80-120	75-125	20
Iron	7439-89-6	6010B	50	2.59	80000	80-120	75-125	20
Lead	7439-92-1	6010B	1	0.17	400	80-120	75-125	20
Lithium	7439-93-2	6010B	5	0.22	200	80-120	75-125	20
Magnesium	7439-95-4	6010B	50	2.42	NA	80-120	75-125	20
Manganese	7439-96-5	6010B	1	0.1	3000	80-120	75-125	20
Mercury	7439-97-6	7471A	0.2	0.08	3	80-120	75-125	20
Molybdenum	7439-98-7	6010B	1	0.04	500	80-120	75-125	20
Nickel	7440-02-0	6010B	1	0.08	2000	80-120	75-125	20
Phosphorus	7723-14-0	6010B	50	3.28	NA	80-120	75-125	20
Potassium	7440-09-7	6010B	50	5.84	NA	80-120	75-125	20
Selenium	7782-49-2	6010B	1	0.28	500	80-120	75-125	20
Silver	7440-22-4	6010B	0.5	0.24	500	80-120	75-125	20
Sodium	7440-23-5	6010B	50	4.14	NA	80-120	75-125	20
Strontium	7440-24-6	6010B	1	0.04	70000	80-120	75-125	20
Thallium	7440-28-0	6010B	1	0.22	1	80-120	75-125	20
Tin (Sn)	7440-31-5	6010B	5	2.54	70000	80-120	75-125	20
Titanium	7440-32-6	6010B	1	0.074	NA	80-120	75-125	20
Vanadium	7440-62-2	6010B	1	0.11	500	80-120	75-125	20
Zinc	7440-66-6	6010B	1	0.53	30000	80-120	75-125	20

NOTES:
Compounds, Reporting Limits, Method Detection Limits, Control Limits, and/or Method versions are subject to change.

TABLE 3

Laboratory Precision and Accuracy Limits
PACE Laboratories - Indianapolis
SW-846 Methods 6010/7470 Metals - Water
Former Exide Battery Site
Logansport, Indiana

Target Analyte	CAS Number	Method	RL ug/L	MDL ug/L	2022 RCG Ground Water Tap Limit ug/L	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
Aluminum	7429-90-5	6010B	200	53.9	20000	80-120	75-125	20
Antimony	7440-36-0	6010B	6	4.33	6	80-120	75-125	20
Arsenic	7440-38-2	6010B	10	3.84	10	80-120	75-125	20
Barium	7440-39-3	6010B	10	0.53	2000	80-120	75-125	20
Beryllium	7440-41-7	6010B	4	0.3	4	80-120	75-125	20
Boron	7440-42-8	6010B	100	7.71	4000	80-120	75-125	20
Cadmium	7440-43-9	6010B	2	0.42	5	80-120	75-125	20
Calcium	7440-70-2	6010B	1000	72.93	NA	80-120	75-125	20
Chromium	7440-47-3	6010B	10	1.21	100	80-120	75-125	20
Cobalt	7440-48-4	6010B	10	0.75	6[b]	80-120	75-125	20
Copper	7440-50-8	6010B	10	2.35	1300	80-120	75-125	20
Iron	7439-89-6	6010B	100	32.4	14000	80-120	75-125	20
Lead	7439-92-1	6010B	10	3.51	15	80-120	75-125	20
Lithium	7439-93-2	6010B	20	4.73	40	80-120	75-125	20
Magnesium	7439-95-4	6010B	1000	57.5	NA	80-120	75-125	20
Manganese	7439-96-5	6010B	10	1.12	430	80-120	75-125	20
Mercury	7439-97-6	7470A	2	0.1	2	80-120	75-125	20
Molybdenum	7439-98-7	6010B	10	0.64	100	80-120	75-125	20
Nickel	7440-02-0	6010B	10	1.45	390	80-120	75-125	20
Potassium	7440-09-7	6010B	1000	84.3	NA	80-120	75-125	20
Selenium	7782-49-2	6010B	10	4.15	50	80-120	75-125	20
Silver	7440-22-4	6010B	10	1.24	94	80-120	75-125	20
Sodium	7440-23-5	6010B	1000	39.3	NA	80-120	75-125	20
Strontium	7440-24-6	6010B	10	0.38	12000	80-120	75-125	20
Thallium	7440-28-0	6010B	10	3.18	2[d]	80-120	75-125	20
Tin (Sn)	7440-31-5	6010B	10	2.28	12000	80-120	75-125	20
Titanium	7440-32-6	6010B	10	1.37	NA	80-120	75-125	20
Vanadium	7440-62-2	6010B	10	2.15	86	80-120	75-125	20
Zinc	7440-66-6	6010B	20	6.92	6000	80-120	75-125	20

NOTES:
Compounds, Reporting Limits, Method Detection Limits, Control Limits, and/or Method versions are subject to change.
[b]Limit may be achievable based on MDL - check with laboratory
[d]To achieve this limit method 6020 must be used

TABLE 3
Laboratory Precision and Accuracy Limits
PACE Laboratories - Indianapolis
SW-846 Method 8260 VOC - Soil
Former Exide Battery Site
Logansport, Indiana

Target Analyte	CAS Number	Method	RL mg/Kg	MDL mg/Kg	2022 RCG R2 SOIL Res. Limit mg/Kg	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %	RPD Max %
Volatiles in Soil									NA
Acetone	67-64-1	8260C	0.1	0.05	NA	NA	NA	NA	NA
Acrolein	107-02-8	8260C	0.1	0.05	NA	NA	NA	NA	NA
Acrylonitrile	107-13-1	8260C	0.1	0.05	NA	NA	NA	NA	20
Benzene	71-43-2	8260C	0.005	0.001	NA	65-124	26-147	20	NA
Bromobenzene	108-86-1	8260C	0.005	0.0025	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	8260C	0.005	0.0025	NA	NA	NA	NA	NA
Bromoform	75-25-2	8260C	0.005	0.0032	NA	NA	NA	NA	NA
Bromomethane (Methyl Bromide)	74-83-9	8260C	0.005	0.004	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	8260C	0.005	0.0025	NA	NA	NA	NA	NA
2-Butanone (MEK)	78-93-3	8260C	0.025	0.012	NA	NA	NA	NA	NA
n-Butylbenzene	104-51-8	8260C	0.005	0.0025	NA	NA	NA	NA	NA
sec-Butylbenzene	135-98-8	8260C	0.005	0.0025	NA	NA	NA	NA	NA
tert-Butylbenzene	98-06-6	8260C	0.005	0.0025	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	8260C	0.010	0.005	NA	NA	NA	NA	NA
Carbon tetrachloride	56-23-5	8260C	0.005	0.0025	NA	NA	NA	NA	20
Chlorobenzene	108-90-7	8260C	0.005	0.0025	NA	64-118	10-147	20	NA
Chloroethane (Ethyl Chloride)	75-00-3	8260C	0.005	0.0025	NA	NA	NA	NA	20
Chloroform	67-66-3	8260C	0.005	0.0025	NA	60-118	27-138	20	NA
Chloromethane (Methyl Chloride)	74-87-3	8260C	0.005	0.0025	NA	NA	NA	NA	NA
2-Chlorotoluene	95-49-8	8260C	0.005	0.0025	NA	NA	NA	NA	NA
4-Chlorotoluene	106-43-4	8260C	0.005	0.0025	NA	NA	NA	NA	NA
Cyclohexane	110-82-7	8260C	0.10	0.05	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	106-93-4	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260C	0.005	0.0025	0.07	NA	NA	NA	NA
Dibromomethane (Methylene Bromide)	74-95-3	8260C	0.005	0.0032	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	110-57-6	8260C	0.1	0.05	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	8260C	0.005	0.0025	NA	NA	NA	NA	NA
Dichlorodifluoromethane	75-71-8	8260C	0.005	0.005	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,2-Dichloroethane (EDC)	107-06-2	8260C	0.005	0.0025	NA	NA	NA	NA	20
1,1-Dichloroethene	75-35-4	8260C	0.005	0.0025	NA	57-133	28-162	20	NA
cis-1,2-Dichloroethene	156-59-2	8260C	0.005	0.0025	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	156-60-5	8260C	0.005	0.0025	NA	NA	NA	NA	20
1,2-Dichloropropane	78-87-5	8260C	0.005	0.0025	NA	64-124	19-149	20	NA
1,3-Dichloropropane	142-28-9	8260C	0.005	0.0025	NA	NA	NA	NA	NA
2,2-Dichloropropane	594-20-7	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,1-Dichloropropene	563-58-6	8260C	0.005	0.0025	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	8260C	0.005	0.0025	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,4-Dioxane (p-Dioxane)	123-91-1	8260C	0.5	0.25	NA	NA	NA	NA	20
Ethylbenzene	100-41-4	8260C	0.005	0.0025	NA	63-119	10-149	20	NA
Ethyl methacrylate	97-63-2	8260C	0.1	0.05	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	87-68-3	8260C	0.005	0.0025	20	NA	NA	NA	NA
n-Hexane	110-54-3	8260C	0.005	0.0025	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	8260C	0.1	0.05	NA	NA	NA	NA	NA
Iodomethane	74-88-4	8260C	0.1	0.05	NA	NA	NA	NA	20
Isopropylbenzene (Cumene)	98-82-8	8260C	0.005	0.0025	NA	61-122	10-150	20	NA
p-Isopropyltoluene	99-87-6	8260C	0.005	0.0025	NA	NA	NA	NA	
Methyl Acetate	79-20-9	8260C	0.050	0.025	NA	NA	NA	NA	
Methylcyclohexane	108-87-2	8260C	0.050	0.025	NA	NA	NA	NA	NA
Methylene Chloride (Dichloromethane)	75-09-2	8260C	0.02	0.01	NA	NA	NA	NA	NA
1-Methylnaphthalene	90-12-0	8260C	0.01	0.01	300	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	8260C	0.01	0.01	300	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	108-10-1	8260C	0.025	0.012	NA	NA	NA	NA	20
Methyl-tert-butyl-Ether (MTBE)	1634-04-4	8260C	0.005	0.0025	NA	63-128	40-145	20	20
Naphthalene	91-20-3	8260C	0.005	0.0025	30	56-124	10-128	20	NA
n-Propylbenzene	103-65-1	8260C	0.005	0.0025	NA	NA	NA	NA	NA

Logansport, Indiana

Target Analyte	CAS Number	Method	RL mg/Kg	MDL mg/Kg	2022 RCG R2 SOIL Res. Limit mg/Kg	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %	RPD Max %
Styrene	100-42-5	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	630-20-6	8260C	0.005	0.0025	NA	NA	NA	NA	20
1,1,2,2-Tetrachloroethane	79-34-5	8260C	0.005	0.0025	NA	60-129	10-190	20	20
Tetrachloroethene (PCE)	127-18-4	8260C	0.005	0.0014	NA	60-122	10-159	20	20
Toluene	108-88-3	8260C	0.005	0.0025	NA	61-117	11-153	20	NA
1,2,3-Trichlorobenzene	87-61-6	8260C	0.005	0.0025	90	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	8260C	0.005	0.0025	80	NA	NA	NA	20
1,1,1-Trichloroethane (TCA)	71-55-6	8260C	0.005	0.0025	NA	60-122	32-140	20	NA
1,1,2-Trichloroethane	79-00-5	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,1,2-Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)	76-13-1	8260C	0.005	0.0025	NA	NA	NA	NA	20
Trichloroethene (TCE)	79-01-6	8260C	0.005	0.001	NA	63-123	14-157	20	NA
Trichlorofluoromethane	75-69-4	8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	96-18-4	8260C	0.005	0.0025	NA	NA	NA	NA	20
1,2,4-Trimethylbenzene	95-63-6	8260C	0.005	0.0025	NA	57-119	10-167	20	NA
1,3,5-Trimethylbenzene	108-67-8	8260C	0.005	0.0025	NA	NA	NA	NA	NA
Vinyl Acetate	108-05-4	8260C	0.1	0.05	NA	NA	NA	NA	20
Vinyl Chloride (Chloroethene)	75-01-4	8260C	0.005	0.0025	NA	37-136	18-155	20	20
Xylenes, Total	1330-20-7	8260C	0.010	0.005	NA	61-120	10-150	20	NA
4-Bromofluorobenzene (surr)	460-00-4	8260C	NA	NA	NA	63-129			NA
Dibromofluoromethane (surr)	1868-53-7	8260C	NA	NA	NA	62-146			NA
Toluene-d8 (surr)	2037-26-5	8260C	NA	NA	NA	68-143			

NOTES:

Compounds, Reporting Limits, Method Detection Limits, Control Limits, and/or Method versions are subject to change.

[a]Limit not achievable

[b]Limit may be achievable based on MDL - check with laboratory

TABLE 3
Laboratory Precision and Accuracy Limits
PACE Laboratories - Indianapolis
SW-846 Method 8260 VOC - Water
Former Exide Battery Site
Logansport, Indiana

Target Analyte	CAS Number	Method	RL ug/L	MDL ug/L	2022 R2 GROUNDWATER Res. Limit ug/L	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
Volatiles in Water								
Acetone	67-64-1	8260C	100	50	20000	NA	NA	NA
Acrolein	107-02-8	8260C	50	25	0.04[a]	NA	NA	NA
Acrylonitrile	107-13-1	8260C	100	50	0.5[a]	NA	NA	NA
Benzene	71-43-2	8260C	5.0	1	5	76-121	68-139	20
Bromobenzene	108-86-1	8260C	5.0	2.5	60	NA	NA	NA
Bromodichloromethane	75-27-4	8260C	5.0	2.5	80	NA	NA	NA
Bromoform	75-25-2	8260C	5.0	2.5	80	NA	NA	NA
Bromomethane (Methyl Bromide)	74-83-9	8260C	5.0	3.9	8	NA	NA	NA
Bromochloromethane	74-97-5	8260C	5.0	2.5	80	NA	NA	NA
2-Butanone (MEK)	78-93-3	8260C	25	12	6000	NA	NA	NA
n-Butylbenzene	104-51-8	8260C	5.0	2.5	1000	NA	NA	NA
sec-Butylbenzene	135-98-8	8260C	5.0	2.5	2000	NA	NA	NA
tert-Butylbenzene	98-06-6	8260C	5.0	2.5	700	NA	NA	NA
Carbon disulfide	75-15-0	8260C	10	5.0	800	NA	NA	NA
Carbon tetrachloride	56-23-5	8260C	5.0	2.5	5	NA	NA	NA
Chlorobenzene	108-90-7	8260C	5.0	2.5	100	74-119	57-137	20
Chloroethane (Ethyl Chloride)	75-00-3	8260C	5.0	2.5	8000	NA	NA	NA
Chloroform	67-66-3	8260C	5.0	2.5	80	68-123	61-138	20
Chloromethane (Methyl Chloride)	74-87-3	8260C	5.0	2.5	200	NA	NA	NA
2-Chlorotoluene	95-49-8	8260C	5.0	2.5	200	NA	NA	NA
4-Chlorotoluene	106-43-4	8260C	5.0	2.5	300	NA	NA	NA
Cyclohexane	110-82-7	8260C	100	50	10000	NA	NA	NA
Dibromochloromethane	124-48-1	8260C	5.0	2.5	80	NA	NA	NA
1,2-Dibromoethane (EDB)	106-93-4	8260C	5.0	2.5	0.05[a]	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260C	10	5.0	0.2[a]	NA	NA	NA
Dibromomethane (Methylene Bron	74-95-3	8260C	5.0	2.7	8	NA	NA	NA
trans-1,4-Dichloro-2-butene	110-57-6	8260C	100	50	0.01[a]	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	8260C	5.0	2.5	600	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	8260C	5.0	2.5	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	8260C	5.0	2.5	75	NA	NA	NA
Dichlorodifluoromethane	75-71-8	8260C	5.0	5.0	200	NA	NA	NA
1,1-Dichloroethane (DCA)	75-34-3	8260C	5.0	0.6	30	NA	NA	NA
1,2-Dichloroethane (EDC)	107-06-2	8260C	5.0	0.6	5	NA	NA	NA
1,1-Dichloroethene	75-35-4	8260C	5.0	2.5	7	63-138	55-158	20
cis-1,2-Dichloroethene	156-59-2	8260C	5.0	0.65	70	NA	NA	NA
trans-1,2-Dichloroethene	156-60-5	8260C	5.0	0.86	100	NA	NA	NA
1,2-Dichloropropane	78-87-5	8260C	5.0	2.5	5	73-127	67-141	20
1,3-Dichloropropane	142-28-9	8260C	5.0	2.5	400	NA	NA	NA
2,2-Dichloropropane	594-20-7	8260C	5.0	4.2	NA	NA	NA	NA
1,1-Dichloropropene	563-58-6	8260C	5.0	2.5	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	8260C	5.0	2.5	5	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	8260C	5.0	2.5	5	NA	NA	NA
1,4-Dioxane (p-Dioxane)	123-91-1	8260C	100	50	5[c]	NA	NA	NA
Ethylbenzene	100-41-4	8260C	5.0	1	700	74-122	54-141	20
Ethyl methacrylate	97-63-2	8260C	100	50	600	NA	NA	NA
Hexachloro-1,3-butadiene	87-68-3	8260C	5.0	2.5	1[b]	NA	NA	NA

TABLE 3
Laboratory Precision and Accuracy Limits
PACE Laboratories - Indianapolis
SW-846 Method 8260 VOC - Water
Former Exide Battery Site
Logansport, Indiana

Target Analyte	CAS Number	Method	RL ug/L	MDL ug/L	2022 R2 GROUNDWATER Res. Limit ug/L	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
n-Hexane	110-54-3	8260C	5.0	2.5	2000	NA	NA	NA
2-Hexanone	591-78-6	8260C	25	12	40	NA	NA	NA
Iodomethane	74-88-4	8260C	10	6.8	NA	NA	NA	NA
Isopropylbenzene (Cumene)	98-82-8	8260C	5.0	2.5	500	75-124	48-145	20
p-Isopropyltoluene	99-87-6	8260C	5.0	2.5	NA	NA	NA	NA
Methyl Acetate	79-20-9	8260C	50	25	20000	NA	NA	NA
Methylcyclohexane	108-87-2	8260C	50	25	NA	NA	NA	NA
Methylene Chloride (Dichlorometh	75-09-2	8260C	5.0	5.0	5	NA	NA	NA
1-Methylnaphthalene	90-12-0	8260C	10	10	10	NA	NA	NA
2-Methylnaphthalene	91-57-6	8260C	10	10	40	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	108-10-1	8260C	25	12	6000	NA	NA	NA
Methyl-tert-butyl-Ether (MTBE)	1634-04-4	8260C	4	2.1	100	71-125	62-143	20
Naphthalene	91-20-3	8260C	1.2	1.2	1[b]	69-128	56-136	20
n -Propylbenzene	103-65-1	8260C	5	2.5	700	NA	NA	NA
Styrene	100-42-5	8260C	5	2.5	100	NA	NA	NA
1,1,1,2-Tetrachloroethane	630-20-6	8260C	5.0	2.5	6	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	8260C	5.0	2.5	0.8[a]	72-123	64-135	20
Tetrachloroethene (PCE)	127-18-4	8260C	5.0	0.93	5	74-129	50-149	20
Toluene	108-88-3	8260C	5.0	1	1000	70-118	59-134	20
1,2,3-Trichlorobenzene	87-61-6	8260C	5.0	2.5	7	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	8260C	5.0	2.5	70	NA	NA	NA
1,1,1-Trichloroethane (TCA)	71-55-6	8260C	5.0	0.89	200	69-125	60-143	20
1,1,2-Trichloroethane	79-00-5	8260C	5.0	2.5	5	NA	NA	NA
1,1,2-Trichlorotrifluoroethane*	76-13-1	8260C	5.0	2.5	10000	NA	NA	NA
Trichloroethene (TCE)	79-01-6	8260C	5.0	0.8	5	73-125	55-147	20
Trichlorofluoromethane	75-69-4	8260C	5.0	2.5	5000	NA	NA	NA
1,2,3-Trichloropropane	96-18-4	8260C	5.0	2.5	0.01[a]	NA	NA	NA
1,2,4-Trimethylbenzene	95-63-6	8260C	5.0	2.5	60	71-121	41-140	20
1,3,5-Trimethylbenzene	108-67-8	8260C	5.0	2.5	60	NA	NA	NA
Vinyl Acetate	108-05-4	8260C	50	25	400	NA	NA	NA
Vinyl Chloride (Chloroethene)	75-01-4	8260C	2.0	0.97	2	46-134	36-154	20
Xylenes, Total	1330-20-7	8260C	10	5	10000	71-123	50-143	20
4-Bromofluorobenzene (surr)	460-00-4	8260C	NA	NA	NA	79-124		
Dibromofluoromethane (surr)	1868-53-7	8260C	NA	NA	NA	82-128		
Toluene-d8 (surr)	2037-26-5	8260C	NA	NA	NA	73-122		

NOTES:
Compounds, Reporting Limits, Method Detection Limits, Control Limits, and/or Method versions are subject to change.
[a]Limit not achievable
[b]Limit may be achievable based on MDL - check with laboratory
[c]Limit not achievable, must use 8270 PAH-SIM method to achieve this limit
*Synonym: 1,1,2-Trichloro-1,2,2-trifluoroethane

Table 4
QA/QC Sample Requirements
Former Exide Battery Site
Logansport, Indiana

	QC Sample Type	Frequency of Sample/Analysis	Details
Field Samples	Duplicate Samples	1 duplicate per 20 samples or less per matrix (follow lab SOP), or 1 duplicate per sample matrix if less than 20 samples	Duplicate sample to be collected by the same methods at the same time as the original sample. Used to verify samle and analytical reproducibility.
Field Samples	Equipment Blanks (or Field Blanks**)	1 equipment blank per 20 samples, minimum 1 equipment blank per day Or 1 field blank per bottle lot used, or one per site, whichever is more frequent	Distilled water placed into contact with sampling equipment. Used to assess quality of data from field sampling and decontamination procedures. ** If all disposable equipment/single use sampling equipment is being used, then field blanks may be collected at a rate of 1 per bottle lot or per site, whichever is more frequent.
Field Samples	Trip Blanks	1 trip blank per cooler containing samples for VOC analysis for water samples	Laboratory prepared organic-free blank to assess potential contamination during sample container shipment and storage, for VOCs in water only.
Field Samples	Trip Blanks	1 trip blank per field sampling event, or per lot of bottles for soils, whichever is more frequent	If soil VOC samples are to be preserved with methanol and/or sodium bisulfate, one set of preserved vials will be included to assess potential contamination during sample container shipment and storage
Laboratory Samples	Matrix Spike/Matrix Spike Duplicate	1 MS/MSD per 20 or fewer samples per matrix (except air)	Laboratory spiked sample to evaluate matrix and measurement methodology.
Laboratory Samples	Method Blanks	1 method blank per batch of samples prepared, or per lab SOP	Laboratory blank sample to assess potential for contamination from laboratory instruments or procedures.
Laboratory Samples	Laboratory Control and Duplicates	Analyzed as per method requirement and laboratory SOPs	Evaluates laboratory reproducibility.

Table 5
Sample Container, Preservation, and Holding Time Requirements
Former Trelleborg Site
Logansport, Indiana

Matrix	Analysis	Container	Preservation	Holding Time
Soil	VOC, using TerraCore methods	3 - (pretared) 40 ml glass vials (add approx 5 gms soil in each from TerreCore sampler); 4 oz jar for moisture	DI water in two (freeze within 48 hours), MeOH in one	14 days
	Metals (Lead)	1 - 4 oz glass jar	Cool to 6^{o} C	6 months
Water	VOCs	each: 3 - 40 ml,level 2 glass vials	Zero headspace, HCL to pH<2, cool to 6^{o} C	14 days
	Metals, total & Field filtered	1 - 500 ml plastic bottle	HNO3 to pH<2, cool to $\leq 6^{o}$ C	6 mos

Table 6
Field Equipment Maintenance Procedures
Former Exide Battery Site
Logansport, Indiana

Instrument	Maintenance Procedures/Schedule	SPARE PARTS IN STOCK
Instrument	Maintenance Procedures/Schedule	SPARE PARTS IN STOCK
Photoionization Detector	1. Calibrate at the beginning and end of each day, or as per manufacturer 2. Check battery and recharge when low. 3. Clean lamp (if possible) and dust filter as necessary	1. Battery charger. 2. Spare lamp (at vendor) 3. Spare dust filters
X-ray Fluorescence Meter	1. Check battery and recharge when low. 2. Clean Kapton windor by gently wiping with cotton swab. 3. Calibration checks at the beginning & end of each day.	1. N/A - all spare parts maintained by vendor
Conductivity Meter	1. Calibrate at the beginning and end of each day, or as per manufacturer 2. Rinse probe after each measurement 3. Recharge batteries as needed	1. Battery charger 2. Calibration solution
pH Meter	1. Calibrate at the beginning and end of each day, or as per manufacturer 2. Rinse probe after each use 3. Recharge batteries as needed 4. Replace electrodes as needed	1. pH buffers 2. Battery Charger. 3. Spare electode at vendor
Redox Potential Meter	1. Calibrate at the beginning and end of each day, or as per manufacturer 2. Rinse probe after each measurement 3. Recharge batteries as needed	1. Battery charger
Dissolved Oxygen Meter	1. Calibrate at the beginning and end of each day, or as per manufacturer 2. Rinse probe after each measurement 3. Replace membrane as needed 4. Recharge batteries as needed	1. Battery Charger. 2. Spare membranes
Water Level Indicator	1. Decontaminate at the beginning and end of each day, and between measurement locations 2. Replace batteries as needed	

Table 7
QA Objectives for Field Measurements
Former Exide Battery Site
Logansport, Indiana

PARAMETER	METHOD REFERENCE	Precision	Accuracy	Completeness
WATER				
Water Level Indicator	Solinist Water Level indicator	+/- 0.01 ft	0.005 ft	95%
Temperature	Electornic Temperature Probe	,+/- 0.5^{0}C	1.0^{0}C	95%
Conductivity Meter	E120.1 Electrometric	+/- 25 umhos/cm	10 uhms/cm	95%
pH Meter	E150.1 Electormetric	+/- 0.1 S.U.	0.05 S.U.	95%
Redox Potential	ASTM 1498-93	+/- 10 mV	10 mV	95%
Dissolved Oxygen	SM-A4500	+/- 0.05 mg/L	+/- 0.1 mg/L	95%
SOIL				
Field XRF	EPA method 6200	Pb = +/- 21 mg/kg	(see Field SOP). Pb = +/- 10 mg/kg	95%
Soil pH	SW-9045	+/- 0.1 pH unit	+/- 0.05 pH unit	95%

APPENDIX A

LABORATORY CERTIFICATIONS

(1st Page Only. Full Certifications Available Upon Request)

1) PACE Indy KS NELAP Cert exp 04-30-23

State of Kansas

Department of Health and Environment

CERTIFICATE

This is to certify that Certification No.: E-10177

Pace Analytical Services, Inc - Indianapolis IN

7726 Moller Road
Indianapolis, IN 46268-4163

has been accredited in accordance with K.S.A. 65-1,109a under the standards adopted in K.A.R. 28-15-36 for performing environmental analyses for the parameters listed on the most current scope of accreditation. Continuous accreditation depends on successful, ongoing participation in the program. Clients are urged to verify with this agency the laboratory's certification status for particular methods and analytes.

Effective Date: 5/1/2022

Expiration Date: 4/30/2023

Myron Gunsalus
Director
Office of Laboratory Services

Carissa Robertson
Certification Section Chief
Office of Laboratory Services

APPENDIX B
LABORATORY QA MANUALS AND SOPS
(AVAILABLE UPON REQUEST)

1 - PACE ANALYTICAL LAB - INDIANAPOLIS - QAM & SOPS

1) PACE Indy Quality Assurance Manual V04 6-29-22
2) PACE Indy Metals Digestion Aqueous
3) PACE Indy Metal Acid Digestion (solids)
4) PACE Indy VOC 8260, 5030, 5035
5) PACE Indy Metals ICP 6010
6) PACE Indy Percent Moisture

APPENDIX C
FIELD DATA SHEETS

<table>
<tr><td colspan="3">Project Name
Smitty Garage</td></tr>
<tr><td>Sample ID
SG-SB-B-01 2 – 4'</td><td colspan="2">Sample Date
01/01/01</td></tr>
<tr><td>Sampled By
DS</td><td colspan="2">Sample Time
12:00</td></tr>
<tr><td rowspan="2">Preservative
None</td><td>X</td><td>Grab</td></tr>
<tr><td></td><td>Composite</td></tr>
<tr><td colspan="3">Analysis Requested
VOC</td></tr>
</table>

BCA Consultants, Inc.

BORING LOG

Borehole ID:
Sheet of

Location					
Project Name	Project Number			Site ID	INDOT DES #
Drilling Company	Driller		Ground Elevation	Total Drilled Depth	
Drilling Equip	Drilling Method	Borehole Dia	Date Drilling Started/Completed		
Type of Sampling Device			Water Level (bgs) First	Final	
			Logged By:	Checked by/Date	
Location Description (include sketch in field logbook)					

Depth	Interval	Description	Sample Interval	PID ppm	Lab Results	Remarks
5						
10						
15						
20						
25						

Log of Borehole: MW-1

Project:
Client:
Location: **Geologist:**

Depth	Description		Material	Annulus	Well	Well Completion
0.0	Ground Surface		Flush	Cover		Steel pro_ concrete pad
1.0						Locking Cap
2.0						
3.0						
4.0						2" Schedule 40 PVC Riser
5.0			Riser	Bentonite		Bentonite Seal and Grout
6.0	**Blank Drill to 15'**					
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						
13.0				Sand		2" Schedule 40 PVC
14.0						10" Slot Screen
15.0			Screen			
16.0	18" Sand brown (10YR 4/3), medium-grained poorly sorted, wet					
17.0						
18.0	19" Gravelly Sand, Same As Above					
19.0						
20.0	8" Sluff; 8" Same As Above; 1" Large gravel; 7" CLAY dark gray (7.5YR 4/1)					
21.0						Threaded Cap
22.0	8" Sluff 15" Clay dark gray					
23.0						
24.0	7" Silt dark gray 17" Clay dark gray					
25.0						
26.0	5" Silt dark gray, wet 20" Clay dark gray					
27.0						
28.0	23" Clay with gravel, dark gray, wet					
29.0						
30.0	probe refusal, hard till					

Drilled By:
Drill Method: HAS
Drill Date:

Hole Size:
Datum:
Sheet: 1 of 1

Project/Site: 7917/12-273

Sampled By: David Scovel, LPG

Sampling Equipment: GeoTech Stainless Steel bladder pump & flow controller - dedicated disposable tubing.

Sample Location	GW Starting Depth	Pump Start Time	Temperature Deg F	Specific Conductivity mS/cm	% Dissolved Oxygen mg/L	pH	ORP mV	Sample Date	Notes
								22'	
P-1	18.30	15:45						8/22/2012	VOCs, SVOCs, Metals, Glycols
		15:48	70.57	1.186	1.87	7.49	-186.9		MS/MSD
		15:51	69.28	1.166	1.02	7.35	-203.7		
		15:54	68.61	1.147	0.79	7.21	-203.5		
		15:57	67.96	1.124	0.66	7.18	-212.7		
		16:00	67.88	1.122	0.62	7.17	-194.7		
		16:03	67.92	1.120	0.61	7.17	-171.6		
		16:06	67.56	1.117	0.62	7.20	-185.8		
		16:09	67.60	1.116	0.70	7.22	-181.4		
		16:12	67.44	1.115	0.60	7.20	-167.8		
		16:15	67.49	1.113	0.58	7.20	-161.5		
		16:18	67.42	1.112	0.57	7.22	-174.9		
		16:21						sampled	
P-2	19.06	14:39						8/22/2012	VOCs SVOCs Metals
		14:42	66.68	1.109	1.38	7.35	-201.1	22'	Glycols
		14:45	65.15	1.086	1.13	7.08	-164.2		
		14:48	64.56	1.084	1.10	7.02	-123.4		
		14:51	64.10	1.086	1.31	7.01	-71.1		
		14:54	63.94	1.098	1.15	6.97	28.5		
		14:57	63.94	1.114	1.17	6.98	-2.9		
		15:00	64.11	1.127	1.21	7.01	-60.8		
		15:03	63.88	1.170	1.27	7.02	-38.0		
		15:06	63.89	1.158	1.23	7.03	-37.3		
		15:09	64.04	1.159	1.22	7.02	14.7		
		15:12	64.02	1.168	1.24	7.04	-22.5		
		15:15						sampled	
P-6	19.53	8:30						8/23/2012	VOCs SVOCs Metals
		8:36	62.60	1.024	6.53	7.55	26.9		Glycols Dup
		8:39	62.20	1.030	5.88	7.38	25.0		
		8:42	61.99	1.021	5.46	7.28	26.2		
		8:45	61.89	1.036	5.13	7.24	25.6		
		8:48	61.91	1.037	4.91	7.25	20.5		
		8:51	62.00	1.037	4.72	7.27	19.8		
		8:54	62.10	1.024	4.57	7.28	17.0		
		8:57	62.21	1.037	4.47	7.29	18.4		
		9:00	62.31	1.037	4.40	7.29	16.0		
		9:03	62.44	1.036	4.35	7.29	12.6		
		9:06	62.51	1.035	4.27	7.29	11.3		
		9:09	62.65	1.034	4.23	7.29	12.4		
		9:12	62.21	1.020	4.22	7.29	5.6		
		9:15						sampled	
P-9	19.05	9:45						8/23/2012	Pump filled with sugar sand
		10:25							took 30 min to get water flow
		10:30							VOCs SVOCs Metals
		10:35	69.10	0.339	0.52	8.59	-408.6		Glycols
		10:40							flow cell full of sand - lost sonde signal
		10:45	68.25	0.435	2.49	8.22	-184.2		
		10:50	68.26	0.450	3.98	7.99	-114.2		
		10:55	68.20	0.463	4.84	7.93	-74.9		
		11:00	68.21	0.474	5.39	7.89	-36.3		
		11:05	68.39	0.480	5.40	7.87	-41.6		
		11:10	68.63	0.486	4.02	7.87	-124.7		
		11:15	68.99	0.491	3.01	7.88	-176.8		
		11:20	68.70	0.494	2.35	7.86	-198.4		
		11:25						sampled	

To assist us in using the proper analytical methods,
is this work being conducted for regulatory purposes?
Compliance Monitoring ______

Client Name: ______ Client #: ______

Address: ______ Project Name: ______

City/State/Zip Code: ______ Project #: ______

Project Manager: ______ Site/Location ID: ______ State: ______

Telephone Number: ______ Fax: ______ Report To: ______

Sampler Name: (Print Name) ______ Invoice To: ______

Sampler Signature: ______ Quote # ______ PO# ______

TAT
___ Standard
___ Rush (surcharges may apply)

Date Needed: ______

Fax Results: Y N

QC Deliverables
___ None
___ Level 2 (Batch QC)
___ Level 3
___ Level 4
Other: ______

SAMPLE ID	Date Sampled	Time Sampled	G= Grab, C= Composite	Field Filtered	Matrix: SL-Sludge DW-Drinking Water GW-Groundwater S-Soil/Solid WW-Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For:										REMARKS

Special Instructions:

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

LABORATORY COMMENTS:
Init Lab Temp:

Rec Lab Temp:

Custody Seals: Y N N/A
Bottles Supplied by Test America Y N

Method of Shipment:

APPENDIX D
FIELD SAMPLING PROCEDURES

FIELD SAMPLING PROCEDURES
BCA Environmental Consultants, LLC

Revised
November 1, 2022
January 25, 2022
December 9, 2019
November 17, 2017
July 25, 2016
November 11, 2015
April 17, 2015

Approved by:

John W. Kilmer, CHMM
VP Technical Services

TABLE OF CONTENTS

APPENDICES

1.0 SAMPLING PROCEDURES

1.1 FIELD LOG BOOKS

Bound Field Log Books will be maintained by the field sampling team members to provide a daily record of significant events, observations, and measurements during the field investigation. All entries will be signed and dated. All documentation errors shall be corrected by drawing a single line through the error so that it remains legible. The error must then be initialed by the responsible individual and the date of the change noted. The correction shall be written adjacent to the error.

All information pertinent to the field survey and/or sampling will be recorded in the log books. These will be bound books, preferably with consecutively numbered pages that are at least 4-1/2 inches by 7 inches in size. Waterproof ink will be used in making all entries. Entries in the log book shall include at least the following information:

1. name of author, date and time of entry, and physical/environmental conditions during field activity
2. purpose of sampling activity
3. location of sampling activity
4. name and title of field crew
5. name and title of any site visitors
6. type of sampled media (e.g., soil, surface water, ground water, solid waste, etc.)
7. sample collection method
8. number and volume of sample(s) taken
9. description of sampling point(s)
10. date and time of collection
11. sample identification number(s)
12. reference for all maps and photographs of the sampling site(s)
13. field observations
14. any field measurements made such as pH, conductivity, water levels, etc.
15. all sample documentation such as:
    a. bottle lot number
    b. dates and method of sample shipments
    c. custody seal numbers
    d. chain-of-custody records
16. PPE levels used

All sample preservation and handling will be in accordance with USEPA recommendations for the parameters collected.

1.2 SOIL SAMPLING

1.2.1 Surface Soils (0-6 inches)

Note: Sampling areas requiring deep soil cores (greater than about 2 feet deep) will be performed using a Geoprobe™-type unit or with a hollow stem auger rig.

Surface samples (less than about 0.5 feet deep) may be collected with stainless steel hand augers, disposable sampling trowels or equipment or by drilling, depending upon site conditions. Each sampling point will be appropriately marked with the sampling point code number and plotted on a site map referenced to some fixed point or points.

Prior to collection, all surface debris (leaves, rocks, etc.) will be cleared away from the sampling point. The drive rods will be marked at appropriate intervals to determine the depth of the samples collected. Soil will be given a geological description based on the USDA or USCS system and recorded. Each sampling point will be measured for total depth of sample. The resultant sample transferred into a properly prepared sample container following sample handling procedures contained in Section 1.2.4. Soil samples to be analyzed for volatiles will not be collected with augers, mixed, composited or otherwise aerated. Large stones or rocks that are present on the sample will be removed prior to transferring the soil into a sample container.

Between each sampling point, all soil sampling equipment, if not disposable, will be thoroughly washed with non-phosphate detergent/water and rinsed with distilled water.

1.2.2 Direct-Push Subsurface Soil Sampling

Direct push probe sampling will be conducted at continuous intervals starting from the ground surface, unless otherwise specified. The sampler will be driven into undisturbed soil by percussive means.

Unless otherwise specified, samplers will be 2 inches in outside diameter, and the inside diameter of the acetate sleeve and drive shoe will be 1-3/8 inches. Sampler drive shoes in good condition will be used.

If sample recovery or condition is unsatisfactory on the first attempt, the driller will advance a second boring location. If the second attempt is unsuccessful, the driller shall continue the boring. The boring log will clearly state any deviation from normal sampling procedures necessary for sample recovery and any observed and suspected disturbance of the sample.

Immediately after completion of driving, the sampler shall be withdrawn from the hole. The rate of withdrawal will be slow enough that neither the sample nor the bottom of the hole is subjected to unnecessary suction force. The sampler will be carefully disassembled, the acetate sleeve removed from the sampler and marked as to depth and orientation. The sleeve will be cut open to allow observation of the soil. After scanning of the sample (see Headspace Screening in Section 1.2.5) and removing a portion for analysis (following Section 1.2.4) the soil will classified in accordance with the USCS classification system. A representative portion of the sample shall be placed into an airtight clean glass jar or in a plastic bag for future reference (not for analytical purposes). Where a change in strata occurs within the sample, a sample of each material will be taken and placed in separate jars/bags. The depth of the change will be recorded. The jar or plastic bag will be clearly labeled as to project, sample location and depth.

1.2.3 Deep Soil Sampling (Drill Rig)

Split-spoon sampling will generally be conducted continuously near the surface and the intervals will not exceed 5 feet at greater depth. The split-spoon sampler will be driven into undisturbed soil below the bottom of the hole after the hole has been cleaned to remove all loose and foreign material.

Unless otherwise specified, split-spoon samplers will be 2 inches in outside diameter, and the inside diameter of the barrel and drive shoe will be 1-3/8 inches. Other dimensions are as specified in ASTM Designation D 1586-67 (reapproved 1974) "Standard Method for Penetration and Split-Barrel Sampling of Soils". Sampler drive shoes in good condition will be used. The sampler will at all times be provided with a ball check valve in accordance with ASTM Designation D 1586-67 (reapproved 1974).

The sampler shall be driven by blows of a drop-hammer, falling freely down a guide rod or pipe. Unless otherwise specified, the drop-hammer will weigh 140 pounds and will fall freely for a distance of 30 inches. Except as otherwise provided below, the sampler will be driven for a total penetration of 18 inches. The number of blows required to drive the sampler each successive increment of 6 inches will be observed and recorded. A penetration resistance of more than 50 blows per 6 inches will be considered as refusal.

Note: although split-spoon sampling is commonly conducted using 3.25-inch or 4.25-inch hollow stem augers (HSA), 5-foot long probe rod with acetate liners may also be used in the HSAs in place of the split-spoon samplers. Sampling procedures for the probe rods are the same as for direct push probing.

If sample recovery or condition is unsatisfactory on the first attempt, the driller will advance and clean the hole to the depth of sampler penetration and make a second attempt. If the second attempt is unsuccessful, the driller shall continue the boring. The boring log will clearly state any deviation from normal sampling procedures necessary for sample recovery and any observed and suspected disturbance of the sample.

Immediately after completion of driving, the sampler shall be withdrawn from the hole. The rate of withdrawal will be slow enough that neither the sample nor the bottom of the hole is subjected to suction force. The sampler will be carefully disassembled to allow observation of the soil. After scanning of the sample (see Headspace Screening in Section 1.2.5) and removing a portion for analysis for volatiles (following Section 1.2.4) the soil will classified in accordance with the Unified Soil Classification System or the USCS classification system. A representative portion of the sample, measuring about 5 inches in length, shall be placed, without ramming, into an airtight clean glass jar or in a plastic bag for future reference (not for analytical purposes). Where a change in strata occurs within the sample, a sample of each material will be taken and placed in separate jars. The depth of the change will be recorded. The jar or plastic bag will be clearly labeled as to project, sample location and depth.

The sample jars or bags will be packed in substantial cardboard boxes in which the jars are separated by cardboard dividers. Boxes will be clearly labeled with the project name, project number, date(s) and the beginning and ending boring numbers.

1.2.4 Soil Sample Handling

After the sampling device is opened, the sample sleeve will be placed on a clean surface. The sample will only be touched with new inner gloves or a clean spatula prior to removal of portions of the sample for laboratory analysis. The sample may be scanned with a PID for identification of high contamination zones. A portion of the sample will immediately be placed in sample jars for laboratory analysis for VOCs and placed on ice in accordance with Method 5035A, following Section 1.2.7. Headspace screening, visual-manual classification and mixing for non-VOC analyses may then be performed as appropriate. Samples for non-VOC analyses will be mixed well from representative portions of the sample interval and placed in the appropriate sample container provided by the laboratory.

1.2.5 Headspace Screening Procedure for Organic Vapors

Soil samples that are collected in sample tubes via the direct-push probing rig or by means of a split-spoon sampler as described above may be field screened for organic vapors via headspace analysis. The probe liners or spoons are split open and scanned with a photo ionization detector (PID). A representative soil type or the soil horizon with the highest PID reading is sampled for VOC analysis by Method 5035A (per Section 1.2.7) using TerreCore samplers provided by the laboratory (see method below). Approximately 4 oz of soil is then removed from the liner and placed into clean plastic zip-lock bags for field screening. Field screening samples are chosen to represent the bottom of each sample, to represent intervals that contained visual and olfactory evidence of contamination, and to represent significant changes in soil type. The bags are allowed to sit while any organic vapors present in the soil sample are released to the atmosphere and trapped in the sample bag.

After at least 10 minutes, the headspace in each of the bags is sampled with a calibrated PID by inserting a probe into the bag's opening while taking care not to introduce ambient air into the bag. The probe pulls a sample of the headspace air from the bag into the PID. The vapor levels are indicated on a gauge, and the results are recorded in the field. Humidity resulting from moist soil samples may create a slow positive response on the meter, thus a note is made when the meter reading occurs after a slow response.

The Photoionization Detector (PID) should be calibrated daily as per Section 3.0 and the manufacturer's instructions. It is generally calibrated to read as Benzene and BCA operates it with a 10.6 eV lamp source. An 11.7 eV lamp source will be utilized on sites where certain compounds are expected to be encountered that are beyond the sensitivity of the standard 10.6 eV lamp. The PID is calibrated on 100 ppm Isobutylene span gas; however, since the gas measured is usually a mixture, the reading does not represent a specific concentration of a specific compound. In screening applications, the actual numerical values recorded are of secondary importance, since there are no established U.S. EPA or IDEM standards for such readings. The relative magnitude of the values between samples and boring locations is considered to be of primary importance in screening for the presence of contaminated samples. In general, background levels would be 0-2 ppm but a slow response of up to 10 ppm may be observed due to moisture interference or natural soil organic matter.

1.2.6 X-Ray Fluorescence Screening for Metals

All X-Ray Fluorescence (XRF) instruments shall be maintained and operated in accordance with the manufacturer's instructions, and EPA Method 6200. Prior to each operational period, the instrument is turned on and is allowed to perform an internal system check. For the NITON XL3t, the check position is the inside of the shutter (closed shutter), which serves as an instrument blank for all elements except two, which are known concentrations. Following this system check, a performance check is conducted, using the appropriate traceable (NIST, TILL and NCS) standard reference material for the analytes of concern. The reference standards are typically low, medium and high concentration standards for applicable metals in SiO_2 in a sealed plastic cup (copies of the certification sheets for standards for the NITON XL3t are attached to this Field SOP). The value should be within +/- 20% of the stated value of the standard. Following this performance check, the method blank sample (SiO_2 in a sealed plastic cup) is analyzed to verify the instrument is not registering false positive results for the analytes of concern. After these checks, the instrument is ready for analysis.

The following operational and quality control requirements apply to operation of the XRF instrument and must be followed and documented in the field logbook maintained by the analyst:

- During operations, the ambient air temperature will be recorded for each measurement and if the ambient temperature changes by more than 10°F, the instrument will be recalibrated.
- A method blank is analyzed at least once a day to determine if contamination is entering the analytical procedure.
- While the instrument is being used, the reference standards and the blank are run once each hour or every twenty samples, whichever occurs first, and also at the end of the period of operation, prior to turning the instrument off.
- For every twenty samples, or at least once per day, analyze a duplicate using the main sampling technique.
- Once per day, check the instrument’s precision by analyzing one of the site samples at least seven times in replicate.
- For every 10 samples analyzed by field XRF, collect one sample and submit it to an off-site laboratory for verification analysis by the appropriate EPA method (usually Method 6010/7471).
- The samples selected for submittal to off-site laboratory will include low, medium and high level concentrations so that the results can be correlated throughout the concentration range for the individual site.
- The XRF field screening results will be compared to the verification laboratory results for each metal by linear regression to determine

correlation and bias. A correlation coefficient of >0.995 will be considered linear.

Detection Limits/Precision/Accuracy/Completeness

From one to a maximum of 14 metals may be tested using this field SOP. The metals that can be conducted for a given investigation are limited by the available calibration verification standards. The following table lists the metals and includes limits information. The detection limits are for a 30 second exposure in a silicon dioxide (SiO2) matrix, the precision and accuracy values are for on in-situ field measurements:

	Metal	DL (mg/kg	Precision (mg/kg)	Accuracy (mg/kg)	Completeness
1	Antimony (Sb)	20 mg/kg	+/- 30	40	95%
2	Arsenic (As)	20 mg/kg	+/- 10	12	95%
3	Barium (Ba)	90 mg/kg	+/- 45	200	95%
4	Cadmium (Cd)	15 mg/kg	+/- 40	30	95%
5	Cobalt (Co)	60 mg/kg	+/- 30	100	95%
6	Chromium (Cr)	200 mg/kg	+/- 40	100	95%
7	Copper (Cu)	35 mg/kg	+/- 15	20	95%
8	Lead (Pb)	30 mg/kg	+/- 21	10	95%
9	Mercury (Hg)	10 mg/kg	+/- 5	5	95%
10	Nickel (Ni)	50 mg/kg	+/- 25	50	95%
11	Selenium (Se)	10 mg/kg	+/- 20	20	95%
12	Silver (Ag)	20 mg/kg	+/- 30	40	95%
13	Vanadium (V)	30 mg/kg	+/- 40	40	95%
14	Zinc (Zn)	50 mg/kg	+/- 50	20	95%

EPA Method 6200 and the manufacturer's SOP (NITON XL3t 500/600) contain detailed instruction and guidance covering implementation of these procedures and any corrective actions that must be taken based on measured instrument behavior and performance. Certification Sheets for Calibration Standards for NITON XL3t are included in Appendix A. If at any time during a field investigation, it appears that the environmental conditions could jeopardize the quality of the measurement results, the measurements will be stopped. This will be documented in the field logbook.

Maintenance

Check the battery level and recharge when it is low. Clean the Kapton window by gently wiping with cotton swab. All spare parts are maintained by the vendor.

Procedure

The in-situ measurements will be conducted as follows:

1. Field screening of soils will not take place during or immediately after a rain event, and it will be performed on dry soil.

2. Large or non-representative debris will be removed from the selected location.
3. The location chosen for analysis will be smoothed and flattened in an area approximately 4” by 4”, using a disposable spoon.
4. The location will be smoothed and firmly tamped to provide as flat and smooth an area as possible and a plastic sheet is placed on the prepared area.
5. Alternatively, the sample may be placed in a plastic bag and homogenized before testing.
6. The nose of the XRF, which is covered by x-ray film, is positioned against the plastic sheet, the shutter released, and the sample data collected for approximately 30 or 60 seconds.

Samples for the offsite laboratory will be collected from the 4”x4” area prepared for *in situ* analysis by using the disposable scoop and laboratory supplied sample containers. Since in-situ measurements are essentially measurements of soil at the surface, the samples collected for offsite laboratory shall be collected from 0-4 inches of the surface

1.2.7 <u>Method 5035A Sampling</u>

TerreCore (or equivalent) sampling devices and pre-tared VOA bottles will be obtained from the laboratory. As soon as a sampling device (split spoon or plastic sleeve) is opened the sampled is scanned with a PID for organic vapor hot spots. The highest response section is selected for analysis. Scrape off a thin layer of soil from the section to be analyzed in order to remove soil/water smeared from other depths. Push the coring device into the soil sample to the full depth allowed and remove the core. Trim any excess soil that is removed with the core. Extract the core into one of the lab-provided 40 mL VOA bottles and immediately seal the bottle. Repeat the process for each of the bottles provided and complete the labels and logging of the samples. For each sample the laboratory will typically provide 1 TerreCore plastic sampling syringe, one 40 mL VOA vial with 5 mL methanol, two 40 mL VOA vials with distilled water and one 40 mL VOA vial or 4 oz soil jar with no preservative. However, extras may also be provided to allow for breakage or QA samples (MS/MSD or field duplicate). Place the sample vials in a ziplock-type bag and store on ice. As soon as practical the samples should be frozen. The samples must be frozen or hand delivered or shipped for delivery at the laboratory (who must freeze the sample) within 48 hrs.

- the disposable sampling device collects approx. 5 g of soil;
- the sample vials are pre-preserved and supplied already labeled with the weight of the vial plus preservative by the lab;
- the sample weight limits are 5 g +/- 0.5 g, and this approx. weight will be determined by doing a 'test' sample and weighing the sampler on a calibrated field scale to determine the approx. fill level of the sampler to be within the + - 0.5 g weight;

- the 'test' sample will be discarded and the actual samples will then be collected, the sampler will be wiped clean, the soil will be extruded into the sample container;
- the sample bottle threads will be wiped clean prior to sealing;
- the sample will be swirled to immerse the soil into the preservative;
- the two distilled water vials and one 5 mL methanol preserved vial will be filled with 5 g samples;
- the sample identification will be written on the lab-affixed label (no new labels will be applied in the field);
- the sampling syringe will be weighed prior to the sample collection, and then the scale will be tared, and the sample will then be collected by direct insertion of the sampler into the soil to collect the 'test sample', then wiped clean prior to placement back onto the scale;
- prior to use or daily, the calibration of the scale will be checked with a 5-gram weight and it should be within +/- 0.1 gram;
- if the ‘test sample’ exceeds the acceptable range (i.e. 4.5 to 5.5 grams) a small amount will be added or removed from the actual samples to better approximate the target weight;
- a test sample will be conducted once per soil type and a minimum of once per site.

1.2.8 Drilling and Well Logs

A daily drilling log will be maintained. The log will accurately describe the geologic materials and depths encountered; the presence or absence of water; drilling rates; time, depth, and description of any unusual occurrences or problems during drilling; and diameters and lengths of material installed. The log will be kept up-to-date with the progress of drilling.

A final boring/well log will be prepared that includes the geologic log, borehole diameters; depth of the bottom of the casing and/or the bottom of the borehole; casing diameters and wall thicknesses; cemented zones; perforated or screened interval(s); type, size, and quantity of gravel pack installed (if any); amount of sand or sediment removed during development; and other information from the daily logs pertinent to the well construction.

1.2.9 Handling of Investigative Derived Wastes

All soil cuttings, purge water, decontamination water or other material removed by drilling operations will be contained and disposed of in a manner consistent with state and federal regulations. IDW will generally be stored in drums, separated by media type, including disposable field supplies. In general, the disposal method will be determined after sample analyses. If any material is determined to be hazardous it will be disposed of accordingly.

1.2.10 Decontamination Procedures and Special Conditions

1. All state and local permits required for the installation of monitoring wells will be obtained before drilling equipment arrives on-site.

2. All water used for drilling, cleaning, and other activities will be clean water from a municipal water supply source or other source approved by the Project Manager.
3. Drilling tools and equipment will be cleaned with clean water and non-phosphate detergent and rinsed, immediately prior to initial entry into the site and immediately upon leaving the site.
4. Samplers will be thoroughly cleaned and decontaminated between each sampler use as described below.
5. The following procedures will be used for soil sampler cleaning:
    a. remove excess soil from sampler (split spoon, hand auger, etc.) using a stiff brush, in a bucket of tap water and non-phosphate detergent;
    b. place cleaned sampler in a bucket of clean tap water and rinse thoroughly;
    c. dry;
    d. place sampler on clean surface prior to use.
6. The following procedures will be used for groundwater sampler cleaning:
    a. wash sampler (bailer, pump, well point, tubing, etc.) with tap water and non-phosphate detergent;
    b. rinse with distilled water;
    c. dry;
    d. place sampler on clean surface prior to use.
7. Wherever practical the use of disposable field sampling supplies is encouraged since the need for decontamination is minimized.

1.2.11 <u>Grout Backfill</u>

Grout backfill is to be used to backfill all auger borings in which monitoring wells are not installed. The grout will be tremmied into the boring or as approved by the Project Manager. The proportions used for grout backfill will be 1 bag of cement to at least 3 to 4 pounds of bentonite and no more than 6 gallons of water. The grout will be injected into the hollow stem auger and maintained at a level inside the auger, such that when a section of auger is removed, the grout level will still be above the bottom of the auger.

Direct push probe holes may be backfilled with grout as described above or they may be backfilled with bentonite in powder, crumbles or slurry form. Generally, bentonite crumbles are used for this purpose due to time and ease of handling. State law requires that all borings be plugged within 72 hours, however, unless approved by the Project Manager, BCA expects all probe holes will be backfilled upon completion. Since projects often involve numerous probe holes on a site, leaving backfilling for the end of the day risks missing some holes. It is the responsibility of the BCA Sampler to verify that all borings have been properly plugged.

1.2.12 <u>Soil Sample Nomenclature</u>

Soil samples will be identified according to the method of collection, the sample location number, and the depth at which the sample was collected. The method of collection will be identified as either Probe (“P”), Soil Boring (SB), Hand Auger (HA) or Boring (“B”). Thus a sample identified as “P-3 (11-12') indicates a soil sample collected at Probe location 3 from 11 to 12 feet below grade. Field QC samples will be identified by a suffix on the sample ID: D or DUP = field duplicate, BLANK, FIELD BLANK or FEQB = field blank. Thus, P-3 (11-12') DUP is a duplicate taken from P-3 at 11-12'. In addition, a project identification and sample matrix code may be added to the front of the sample ID. Thus, a subsurface soil sample from ACME Chemical would be identified as AC-SB-P3 (11-12').

1.3 GROUNDWATER SAMPLES

1.3.1 Groundwater Monitoring Wells

All well casing and screens will typically be constructed of 2-inch flush joint threaded schedule 40 PVC pipe. Depths and thickness of the sand pack, bentonite, and grout will be verified by the field crew. Well screens will be factory slotted with 0.010 inch openings. Only Teflon tape will be used to lubricate the threads.

A sand pack will be installed around the screen to a depth of 2 feet above the screen. If field conditions (such as heaving sands) do not allow the installation of a sand pack it will be noted on the well log. Bentonite seals will be installed above the screens, and lockable steel protective covers, anchored in concrete, will be installed at the ground surface.

Because of the potential for downward migration of contaminants around the wells and in the borings, the wells will be grouted between the bentonite seal and the concrete anchor with a slurry of cement and bentonite. The slurry will consist of one bag of cement to 3 to 4 pounds of bentonite to no more than 6 gallons of water or as approved by the Project Manager.

All wells will be protected at the surface by a “flush-mounted” or “stick-up” 4-inch diameter steel protective casing with lockable cap. The base of the steel casing will be set a minimum of 3 feet into the grout. A tag or waterproof label identifying the well will be placed inside the steel casing so that the tag is visible with the cap removed. The cap and vent will fit in such a way that it will be impossible to tamper with the well if the cap is closed. For stick-up protective covers the outside of the protective casing will be painted bright orange, yellow, or red. Padlocks will be installed immediately upon completion.

Wells will be developed by pumping or bailing (and surging if required) until the purged water is clear to the satisfaction of the Project Manager.

1.3.2 Monitoring Well Sampling

Prior to purging each well, a static head measurement (nearest 0.01') will be taken using an electrical water level detection device. The depth of the well will also be measured (nearest 0.01'). At each well, a permanent mark will be placed on the top rim of the riser pipe, such that all measurements will be taken for the same location. By subtracting the static head from the total well depth, the volume of the standing water can be calculated. The well will be checked for the existence of both light and dense (floating and sinking) non-aqueous (immiscible) phase liquids and the thickness measured if appropriate. Measurements for indicator parameters (such as conductivity, pH, and temperature) may also be taken on the stagnant well water, prior to pumping.

Well development and purging will be performed with an electric or airlift submersible pump, an inertial pump, or a bailer. At each well the pump will be lowered into the casing and positioned so the intake is near the top of the water column. Following development monitoring wells shall generally be sampled by means of low flow sampling. If parameter stability is not achieved using low flow sampling or the well is low yield, then standard (high flow) purging procedures will be used.

Low-Flow Sampling

Wherever possible micro-purge sampling protocol outlined by IDEM/OLQ (Appendix B) will be utilized for monitoring wells. A centrifugal pump will be used or a peristaltic pump may be used if VOCs are not to be analyzed. A transparent multiprobe, in-line flow cell will be used to monitor parameters. Tubing will be teflon or teflon-lined polyethylene. A dedicated pump or single-use tubing will be used for each well. To the extent possible, drawdown will be limited to 0.3 feet and extraction rate will be between 0.1 and 1.0 lpm. The extraction rate will start out as low as possible and increase consistent with the drawdown limit. Stability parameters typically used (listed in increasing order of sensitivity) are pH, temperature, specific conductivity, oxygen-reduction (redox) potential, dissolved oxygen (DO) and turbidity. Stability is based on three consecutive measurements of these field parameters falling within the stated criteria: +/- 10% for DO, +/- 3% for conductivity and temperature, +/- 10 microvolts for redox, and +/- 0.1 pH unit. Other sample handling procedures will be the same as those listed below for high-flow sampling.

High-Flow Sampling

The pump will then be started and a minimum of 3 times the standing volume of water will be removed. If the quality of water remains unsuitable for collection based on the indicator parameters, additional water will be purged until it clears (if possible) or the indicator parameters stabilize. Stability shall be indicated by pH measurements within 0.1 unit and conductivity and temperature measurements +/- 3%.

Low yielding wells will be evacuated to dryness by slowly lowering the pump into the screen area during pumping or bailing to remove as much water as practical. If the well exhibits a moderate recovery rate it will again be evacuated to dryness prior to sample collection. Wells that exhibit very slow recharge rates will be evacuated to dryness and allowed to recover until sufficient volume is available for sample collection.

Electric, bladder or inertial pumps may be used to collect groundwater samples. For all pumps the flow rate must be reduced to less than 0.5 lpm to prevent splashing in VOA sample bottles. A bottom filling Teflon bailer may be used for the collection of groundwater samples. Teflon is chemically stable, allows for complete cleanup between wells, and can be used to collect samples for both inorganic and organic analyses. Thin-walled (i.e. disposable) Teflon bailers should not be decontaminated and reused. The bailer will be suspended by a Teflon coated or single strand stainless steel wire. The bailer or pump will be lowered slowly and not be dropped into the well, because this can cause degassing of the water upon impact.

To avoid cross-contamination, all pumps, delivery lines, and bailers will be drained, washed with detergent, thoroughly rinsed with tap water, then flushed with distilled water after each well. Clean sampling equipment will never be placed directly on the ground or other potentially contaminated surfaces.

Field data log sheets will be maintained for all groundwater sample collection. The following information will be entered in the field log sheets:

sampler's name
time and date of collection
sample location
sample type
sample ID
volume of each sample
preservatives
unusual conditions concerning samples
(I.e., color, odor, sediment, etc.)
static water levels prior to pumping (depth and MSL elevation)
amount of water evacuated prior to sampling
well recoveries
field conditions (weather, air temperature)
sampling technique
equipment used and any malfunctions or modifications
From specified sampling procedures
indicator parameters measured in the field
(i.e., pH, conductivity, temperature).

The sequence of operations to be followed when sampling a monitoring well are summarized as follows:

1. Decontaminate all sampling and pumping equipment as appropriate.
2. Remove the padlock and protective cap.
3. Sample the air above the well head with a PID and record reading, if appropriate.
4. Use electrical sounding device to measure depth to static water level in well from reference mark, then lower to bottom of well to measure well depth. Record water level and depth measurements.

5. If a floating layer is suspected: lower the bailer slowly to about 1 foot below the water surface, retrieve and check for floating immiscible layer. Collect sample if present.
6. If a sinking layer is suspected, repeat (5), but lower to bottom of well to check for dense phase immiscible layer. Collect sample if present.
7. Calculate the volume of water in the well casing.
8. Lower pump into well to just below the water table, start pump, and discharge water into container of known volume to keep a record of water pumped. Monitor stability parameters during pumping at about 1 minute interval. After a minimum of 3 well volumes of water have been removed <u>and</u> the indicator parameters have stabilized, stop and remove the pump. Stability shall be indicated by pH measurements within 0.1 unit and conductivity measurements +/- 3%. Record the final temperature, pH and conductivity and the volume of water removed from the well. If the pH, conductivity and temperature do not stabilize, sample the well and note the lack of stability.
9. Lower the bailer (or sample pump) slowly and collect samples from the screened zone of the well, taking care to transfer contents of the bailer directly to the sample container (except as provided below) in a way that will minimize agitation and aeration of the sample. Verify that there are no (or as little as possible) air bubbles in the sample container. Fill VOA bottles first to minimize loss of VOCs, then fill SVOC/PAH bottles, and finally fill metals and wet chemistry parameters. The person collecting the samples will take care not to touch inside of bottle or lid and not to place either on the ground or other contaminated surface.
10. Complete the appropriate labels on the sample bottles, attach the custody tape if appropriate and place the sample in an ice chest immediately.
11. Complete the field log sheets.

1.3.3 <u>Temporary Wells (Probe Groundwater Sampling)</u>

For groundwater sampling from Direct-push Probes a temporary 1-inch PVC monitoring well will be set in the bore hole. Prior to sampling, the well will be purged to reduce turbidity in the sample. Low-flow sampling per Section 1.3.2 will be conducted if aquifer conditions are suitable.

Where practical a submersible stainless steel pump with single-use disposable bladders will be used to purge and sample. If low yield is encountered in the temporary well, the well will be purged until dry and then allowed to recharge before sampling. A peristaltic pump and single-use disposable tubing may be used to purge or deliver the water sample to the surface, if VOCs are not among the target analytes. If a bailer is used it will be lowered slowly and not be dropped into the well, because this can cause degassing of the water upon impact.

1.3.4 <u>Field Filtered Samples</u>

Aqueous samples for analysis of dissolved parameters such as metals, TOC, Iron II may be filtered in the field prior to preservation if analysis is required on the filtered portion of the sample. For each sample a new 10 um (or 5 um if approved by IDEM) membrane filter cartridge will be attached directly to the sampling tube from the well. Prior to each sample filtration, the cartridge will be flushed with sample water. The sample water flush will be discarded. The sample water will then be filtered directly into the sample container, preserved, and placed into a cooled (to 4^0 C) chest for shipment. In highly turbid conditions, groundwater samples may be collected in laboratory provided 1L glass or plastic unpreserved bottles and set aside for sediments to settle prior to decanting into sample containers.

1.3.5 Volatile Organic Samples

Samples collected for volatile organics analyses will be placed only in 40 ml VOA bottles with Teflon lined septum caps and HCl preservative. Special care will be taken to collect the samples with the least amount of agitation and loss of volatiles. Three identical samples will be collected, pumped directly from the well through sample tubing to the sample bottles. The bottles will be only slightly over-filled to form a positive meniscus, and (taking care that the Teflon liner is facing down toward the top of the of bottle) the screw cap will be applied and the sample checked for bubbles. The bottles should not be overfilled since overfilling can spill and void the preservative. If the preservative is voided, the sample bottle should be discarded and a new bottle used. If bubbles are observed, the cap will be removed and the bottle refilled, and the procedure outlined above will be repeated until no bubbles are present. If the bubbles cannot be eliminated, then an unpreserved sample should be collected and so noted in the field log book and on the sample container and CoC form.

1.3.6 Groundwater Sample Nomenclature

Groundwater grab samples collected through field probes will be assigned the probe number (P1, P2, etc.), and may include the depth in the probe. Therefore, a groundwater sample described as P1 (11-15') indicates a groundwater grab sample collected in a field probe site from 11 to 15 feet below grade. Field QC samples will be identified by a suffix on the sample ID: D or DUP = field duplicate, BLANK, FIELD BLANK or FEQB = field blank. Thus, P-1 DUP is a duplicate taken from P-1.

1.3.7 Sampling Water Supply Wells

All applicable provisions from the sections above on groundwater sampling will be followed. These samples will be collected from a sampling cock or valve placed up stream of any water treatment equipment such as ion exchange softeners, reverse osmosis, or other filtration units. Water will be flushed at or near maximum flow for at least 3 minutes prior to sample collection. The flow will reduced to a minimum before sample collection. No filtering will be performed in the field on these samples.

1.4 SURFACE WATER SAMPLING

If a SOP for sampling surface water is needed, a QAPP addendum will be prepared/submitted for review/approval prior to field sampling.

1.5 DRUM SAMPLING

If a SOP for drum sampling is needed, a QAPP addendum will be prepared/submitted for review/approval prior to field sampling.

1.6 SOLID WASTE MATERIALS

If a SOP for solid waste sampling is needed, a QAPP addendum will be prepared/submitted for review/approval prior to field sampling.

1.7 PAINT CHIP SAMPLING FOR LEAD

Paint chip sampling is a destructive method that may release a small quantity of lead dust. Although paint chip samples are to be collected from inconspicuous areas, the occupant must always be notified that paint chip sampling may be necessary.

1. Containment:

Plastic Sheeting Underneath Sampling Area – A clean sheet of plastic measuring four feet by four feet should be placed under the area to be sampled to capture any paint chips that are not captured by the collection device or creased piece of paper. Any visible paint chips falling to the plastic should be included in the sample. Dispose of the plastic at the dwelling. Wet wipes may be used to clean the area.

2. Paint Sample Collection:

The paint chip sample need not be more than 1" x 1" in size. Persons collecting paint chips should wear new disposable gloves for each sample. The most common paint sampling method is to scrape paint directly off the substrate. The goal is to remove all layers of paint equally, but not of the substrate. A heat gun should be used to soften the paint before removal to reduce the chances of including substrate with the sample and to help prevent sample loss. Including substrate in the sample will dilute the lead content if results are reported in ìg/g or weight percent. Hold the heat gun no closer than six inches from the surface. Do not scorch the paint. Discontinue heating as soon as softening or blistering is observed. Use a razor-sharp scraper to remove paint from the substrate. Paint samples collected in this fashion are usually reported in ìg/g or % lead only. The sample may be placed in a baggie for shipment to the laboratory.

3. Composite Paint Chip Sample Collection:

Paint chip samples may be composited by collecting individual subsamples from different surfaces. When results are reported in weight percent or ìg/g, each subsample should have about the same weight. The result is then compared to the standard for lead-based paint divided by the number of sub-samples (the composite standard). If the result is above this number, one or more of the samples must be above the standard. Each sample should be reanalyzed individually in this case. If the result is below the number, none of the subsamples can contain lead above the standard. No more than 5 subsamples should be included in the same sample container or ziplock baggie. If both single-surface and composite samples are collected side-by-side, the individual samples can be submitted for analysis without returning to the dwelling if the composite result is above the composite standard.

4. Cleanup and Repair:

a. All settled dust generated must be cleaned up using wet wipes.

b. The surface can be resealed with new paint if necessary. If desired, apply spackling and/or new paint to repair the area where paint was removed.

c. Personnel conducting paint sampling should avoid hand-to-mouth contact (specifically: smoking, eating, drinking, and applying cosmetics) and should wash their hands with running water immediately after sampling. The inspector should ask to use the resident's bathroom for this purpose. Wet wipes may be used if no running water is available or if the bathroom is not available.

5. Form Completion:

Chain of custody requirements should be followed.

1.8 LEAD-BASED PAINT INSPECTION

A licensed inspector will conduct all inspections for structures intended for child-occupancy. A general visual inspection of the residential unit is to be performed and the living areas are to be delineated into "Room Equivalents." A room equivalent is an identifiable part of a residence (e.g., room, house exterior, foyer, etc.). Painted surfaces include any surface coated with paint, shellac, varnish, stain, paint covered by wallpaper, or any other coating. Building and paint film condition observations were made and recorded. Occupant interviews are conducted if not completed prior to the inspection. Unusual or noteworthy conditions are photographed. A lead-based paint inspection consists of a component by component evaluation of painted architectural building surfaces to determine the lead content of each painted surface. Glazed brick/ceramic, porcelain, mirrors and factory-finished metal components and similar older factory-finished components, if present, are selectively tested for lead content on a discretionary basis due to the potential to cause a hazard from lead dust if severely damaged.

The objective of the risk assessment is to identify lead hazards that may exist within a building. Lead hazards are defined as follows:

- Lead paint that is deteriorated (flaking, chipped, peeling, etc.).
- Lead paint on a friction surface (i.e. rubbing doors, sliding windows, etc.) where associated dust levels exceed safe limits.
- Lead paint on an impact surface (i.e. door jambs, stair treads, etc.) where the impact is caused by another building component.
- Lead paint on a chewable surface (i.e. windowsills, shelves, etc.) where there is visible evidence of teeth marks.
- Lead dust and bare soil levels exceeding safe limits. In cases where survey methods detected LBP and the paint was in poor condition

(cracked, peeling, chalking, etc.), a determination of the hazard presented was performed based on the area of the damage, location, child exposure potential and dust samples results (if applicable).

Selected sites in each room, including all walls and nominally one site for each type of component tested, as well as the exterior were surveyed for the presence of LBP using a spectrum analyzer portable X-ray fluorescence (XRF) paint tester, Heuresis, Pb200i Lead Paint Analyzer, MISys Mfg. SLT Info: Item No. 1- 000092 A Serial No. 2073. The performance characteristics sheet for the instrument is attached at the end of this document. The spectrum analyzer automatically subtracts from a spectrum the fluorescence from the substrate of the paint, so as to give an accurate reading of lead content without taking of samples or stripping of the paint. This is performed via a computer program stored in the analyzer, which gives an instantaneous readout of the lead content of a site in milligrams of lead per square centimeter of surface area (mg/cm2). The instrument performance is checked before and after the project survey by reading a 1.0 mg/cm2 sample three times. The instrument performance is similarly checked during the survey at least once every 4 hours.

The XRF analyzer interprets the fluorescence from the lead atoms to determine the amount of lead in paint. Lead present at or above 1.0 mg/cm2 is defined by EPA and HUD as “lead-based paint.” Lead inspection data is recorded by location ("Room Equivalent"), color, substrate, and component/architectural surface. The lead results are recorded by the instrument and downloaded into a XRF data table.

The Performance Characteristics of the MISys Mfg. Heuresis Pb200i Lead Paint Analyzer are included as Appendix C.

1.9 ASBESTOS SAMPLING

A licensed inspector will review the project layout on-site using maps and floor plans which are available. Areas being sampled will be cordoned off and a sign indicating “Asbestos Danger” will be posted. Wearing respiratory protection, soft materials such as some thermal system insulation and spray applied surfacing materials will be sampled using a coring device to penetrate all layers of the insulation. The sampled material will be first sprayed with a water-detergent mixture until wet, and a core will be collected. The sample core will then be placed in a zip-loc plastic bag and assigned a sample number. The coring device will be decontaminated with the water-detergent mixture and wiped with a paper towel. The towel will be placed in a zip lock trash bag. The penetration of all friable materials will be repaired with duct tape.

Hard materials such as floor tile, cementaceous panels, plaster and wall board will be sprayed with water-detergent mixture and chipped using chisel, screw driver or knife. The sample will be placed in a zip-loc plastic bag and assigned a sample number. The sampling device will be decontaminated with the water-detergent mixture and wiped with a paper towel. The towel will be placed in a zip lock trash bag.

Sampling locations will be photographed and the Homogeneous area code, material name, description, thickness of material, type, friability class, whether sampled or presumed, and reference location will be noted.

Samples will be submitted to a NVLAP-certified laboratory for testing.

1.10 VAPOR SAMPLING

Indoor and ambient air, crawl space, exterior soil gas, sub-slab soil gas, and conduit vapors will be sampled and analyzed for volatile organic compounds (VOCs) in accordance with the IDEM Risk-based Closure Guide's (RbCG or R2) procedures for Vapor Sampling Section 2.2.6 dated July 8, 2022 and the US EPA method TO-15.

Indoor, crawl space, and ambient air sampling will follow IDEM R2 procedures as found in sections 2.2.6.5 Sampling Crawl Space Air, 2.2.6.6 Sampling Indoor Air, and 2.2.6.7 Ambient Air Sampling. All indoor, crawl space, and ambient air samples will be collected using 6 Liter Summa canisters with 8- or 24-hour control valves, prepared, calibrated, and provided by the analytical laboratory. Longer duration sample events may be specified by the project manager.

Summa canisters will be placed to sample the indoor air from the basement and living space(s) of occupied structures. For indoor and basement spaces, the inlet of each canister (consisting of a length of dedicated, disposable polyethylene tubing) will be placed at breathing height, roughly 3 to 5 feet above the floor.

A Summa canister is an airtight, stainless-steel container with an inner surface that has been electro polished and chemically deactivated. The process of chemical deactivation is the “Summa” process. Summa canisters range in volume from 1 liter to greater than 15 liters. The 6-liter canister commonly is used to collect samples of indoor and ambient air while the 1-liter canister commonly is used for sub-slab vapors and exterior soil gas or short (typically less than 1 hour) duration grab samples. A laboratory evacuates a Summa canister to a high vacuum (at least -28 inches of mercury). A Summa canister can hold the high vacuum for up to 30 days. The advantage of the Summa canister is that the air being sampled is “drawn” into the canister at a specified rate by the high vacuum thereby eliminating the need for pumps or other powered equipment. A “Flow control valve” is used to control the rate at which an air sample is drawn into a Summa canister. The flow controller, which is stainless steel, typically is adjusted so that the air can be sampled for a predetermined time.

Prior to an indoor air sampling event, the Vapor Intrusion Investigation Documentation (IDEM Remediation Technical Guidance VI Investigation, August

8, 2016; revised September 2020) for each facility to be sampled will be completed to identify and remove any potential background contamination sources such as paint cans, household cleaners, and others. If appropriate, and where practical, owners will be encouraged to seal cracks or holes in walls or floors that could facilitate migration of vapors.

Exterior soil gas (SGe) and Subslab soil gas (SGss) sampling will follow IDEM R2 procedures as found in sections 2.2.6.2 Sampling Exterior Soil Gas and 2.2.6.3 Sampling Subslab Soil Gas.

For subslab (SGss) sampling, a small hole, typically 0.5 to 0.625-inch, is drilled through the concrete slab and an approved brass vapor sampling port with a silicone seal (Vapor Pins® or similar) is set in the slab with a length of polyethylene tubing attached for sampling.

For exterior Soil Gas (SGe), the samples may be collected through an approved, permanently installed, stainless steel soil gas sample port placed 5 to 10 feet BGS and connected to the surface with a length of dedicated HDPE tubing. The soil gas sample points will be installed by use of hand driven vapor point installation tooling, a hand auger, or a direct-push probe system. The soil gas points will be driven to depth, or borings will be drilled to depth and the sample point attached to dedicated poly tubing will be lowered to the bottom of the hole. Clean silica sand filter pack will be poured in to approximately 1 foot above the soil gas sample point. The borehole will be back filled with granular bentonite to the ground surface. 1 gallon of distilled water will be poured onto the bentonite to seal the borehole.

The sample train for the SGss and SGe samples will consist of the brass vapor sampling points and tubing with polycarbonate Luerlock® valves and fittings arranged in a “T” configuration to allow the train to be purged from one leg. Prior to sampling, the sample train will be purged utilizing a PID (with a flow rate of up 550 mL/min) for 1 minute (or a minimum of three sample train volumes).

SGss and SGe sample trains will be leak tested by applying 10-15” of vacuum to the sample train assembly (minus Summa canister). The vacuum is achieved by means of a hand pump with analogue pressure/vacuum gauge. If the assembly holds the vacuum for 90 seconds or longer, it is considered leak free and used for the sample. If a drop in vacuum is observed, fittings are adjusted or replaced accordingly, and the assembly will be retested.

Purging and sampling procedures will follow those described in the IDEM R2 guidance. Immediately after the SGe points are installed and sealed, the volume of air in the sand pack will be calculated and approximately three times the calculated volume of air will be slowly purged using a PID. If possible, sampling will be conducted no sooner than 24 – 48 hours after sample port installation and sand pack purging, to allow subsurface vapors to equilibrate. Prior to sample collection, the internal volume of the sampling apparatus, including the implant screen and the tubing, but excluding the sample container volume and the sand pack will be determined. This dead volume of air in the sampling apparatus requires purging prior to sample collection. Approximately three times the dead volume of air will be slowly purged prior to sampling.

All sub-slab and exterior soil gas samples will be collected using 1 liter Summa canisters with a 5 minute to 1 hour control valve (specified by project), prepared, calibrated, and provided by the analytical laboratory.

To help identify source areas or delineate hot spots, sub-slab and exterior soil gas sampling may also consist of a series of passive sampling devices laid out in a grid pattern to conduct a shallow soil gas survey. Passive samplers require longer term sample collection periods than Summa can sampling methods.

Conduit vapor sampling will follow IDEM R2 procedures as found in section 2.2.6.4 Sampling Conduit Vapor.

As an identified and commonly accepted preferential pathway for vapors to freely migrate through the sub-surface and into nearby structures, sanitary sewers (conduits) have become a focal point for vapor intrusion investigations. A utility survey should be conducted at the site and immediately adjoining/adjacent city rights of way (ROW) to identify and map the locations of the sanitary sewer mains and laterals. The survey should consist of visual and ground penetrating radar (GPR) scans of the site to identify sewer laterals to the street. All identified buried utilities are to be mapped and presented on a Site Layout map in the report. Sewer manholes in the ROW are to be opened to determine the direction of flow and the locations of the manholes and depths of the pipes will be recorded and identified on the Site Layout Map. Conduit vapors may be sampled from within the sewer manholes, sanitary cleanouts, vent stacks, or sink drains. The conduit vapor samples will be collected using 6L canisters with 24-hour control valves. For sewer manholes, the canisters will be suspended just below the manhole cover on wooden dowels placed in the sewer manways and the Teflon tubing extended down to within 1 foot of the exposed waste stream and as close to the inlet pipe as possible. For other conduit sampling, vent stack, drains, cleanouts, etc, the sample tubing will be placed as far into the conduit as possible prior to collecting the sample, being careful not to intercept fluids within the conduit.

Quality Control/Quality Assurance (QA/QC) sampling procedures will be undertaken. To document the absence of leaks, for all canisters the vacuum will be recorded on the canister label at the lab before shipment, in the field before sampling, in the field after sampling and at the lab before analysis. The vacuum is measured at the lab on the evacuation and sampling equipment and in the field on the flow controller. If the vacuum measured in the field at start of the sampling is greater than 10% less than that measured in the lab and recorded on the canister tag, then the sample should be flagged for potential interference or estimated result. If the vacuum measured before use is less than -24” Hg, then the canister should not be used. The canister and flow control serial numbers (along with field vacuum measurements) are recorded on the Chain-of-Custody to help track any equipment failures. The flow controllers are calibrated to ensure that a small vacuum remains in the canister after the calibrated sampling period. By checking the sampling times and the residual vacuum, even flow over the sampling period can be confirmed. If no vacuum remains in the canister when returned to the lab, the sample should be flagged as potentially not being representative of the full sampling period, but of some lesser time. If the vacuum remaining in the canister is greater than 10 inches of mercury, the sample remains valid, but the detection limit may be significantly affected due to low recoverable sample volume. One SUMMA Canister per lot is retained by the lab or canister supplier and checked for leaks over time. A field duplicate will be collected from one of the test locations. The duplicate sample will be placed immediately adjacent to test location to test the repeatability of sample. Background ambient air samples will be collected from up-wind and down-wind directions.

1.11 <u>SAMPLING FOR SVOCS WITH PUF SAMPLERS</u>

The following procedures are for use of the High Volume Polyurethane Foam (PUF) sampling method for collecting samples for semi-volatile organic compound (SVOC) analysis including pesticides and polychlorinated biphenyls.

• All PUF sampling media should be obtained from the laboratory, having been pre-cleaned, loaded into High Volume PUF sample cartridges, and sealed in solvent washed cans by the lab.
• Chain-of-custody shall be maintained for all samples.
• Powder-free latex or gloves will be used when handling all PUF/XAD cartridges and quartz particulate pre-filters. Assure that the red silicon upper and lower gaskets, located in the cartridge housing, are in place. Then remove the PUF/XAD cartridge from the shipping container, remove from the foil and insert the cartridge into the High Volume sampler's chamber. The pre-filter should be installed in the filter holder using caution not to over tighten the fittings. The foil should be placed back in the shipping container. The container should be labeled with site ID, operator's name, and sample date, and placed in the High Volume sampler enclosure until the sample is collected.
• The High Volume sampler should be turned on and allowed to run for two minutes. An initial flowrate should be recorded on the sample data sheet. The timer should be set to turn the sampler on and off at the desired times.
• The operator should retrieve and secure the sample as soon as possible after the sampling period ends. The sampler should then be manually turned on and allowed to run for two minutes. A final flowrate should be recorded on the sample data sheet. The final flowrate should be at least 150 liters per minute. The PUF/XAD cartridge should be removed, and the quartz pre-filter folded and placed in the top of the PUF/XAD cartridge. The PUF/XAD cartridge and pre-filter should be re-wrapped in the original aluminum foil and placed back in the shipping container. The container should then be tightly sealed. Complete the sample data sheet and Chain-Of-Custody Record and seal the shipping

container with a sample custody seal. Finally, the shipping container containing the sample should be placed in a cooler containing frozen eutectic salt packs (at a nominal temperature of ~ 15o C), or equivalent. When all samples are collected from all sites, the cooler should be sealed with sample custody tape for transport back to the laboratory.

• Upon arrival of the metal container at the laboratory, the samples shall be stored in the metal container in a refrigerator until submitted for extraction.

1.12 FIELD QUALITY CONTROL

Quality control is maintained by taking field duplicates, field equipment blanks and trip blank samples. Duplicates and blanks will be performed at a rate specified by the QAPP or the site-specific SAP. Duplicate samples of soil/solid matrices will be obtained by cutting the sample spoon core or composited sample lengthwise into two equal parts, then placing similar portions of each of the halves into separate sample jars. Field equipment blanks are submitted to serve as a check for laboratory, field, and sample bottle contamination. They are prepared by pouring distilled water over sampling equipment (following routine decontamination) and draining it into the sample bottle. Trip blanks shall be prepared by the laboratory using organic-free water to test for potential cross-contamination of VOCs during storage and shipment. If TerreCore samples are to be collected then a set of pre-preserved vials may be included by the lab to assess potential contamination during shipment and storage.

New sample bottles are to be used for all sampling and are not to have been used for any previous purpose. The bottles are to be opened immediately prior to the actual sampling. After their use, they are sent back to the laboratory and discarded after all analyses are completed.

1.13 SAMPLE CONTAINERS AND HOLDING TIMES

Sample container will be as specified by the laboratory or the QAPP.

2.0 SAMPLE CUSTODY

2.1 CHAIN-OF-CUSTODY RECORD - FIELD

To establish the documentation necessary to trace sample possession for samples shipped off-site, a chain-of-custody record will be filled out and accompany each group of samples. This record becomes especially important when the sample is to be introduced as evidence in a court litigation. An example of the chain-of-custody record is illustrated on the following page.

The record must contain the following minimum information:

1. collector's sample number
2. signature of collector
3. date and time of collection
4. place and address of collection
5. sample type (waste, soil, surface water, ground water)

6. signatures of persons involved in the chain-of-possession
7. inclusive dates of possession

In addition to the above information recorded on the chain-of-custody, all information will be recorded in a field logbook as described in Section 1.1 utilizing sample location nomenclature established in the same section.

2.2 CHAIN-OF-CUSTODY RECORD - LABORATORY

The laboratory Sample Management Section will manage and track the storage and distribution of all samples once they arrive at the laboratory. When samples are received by the laboratory, the Sample Custodian will examine the shipping container and record all pertinent information on both the Project Sheet and the Chain-of-Custody Log-In Sheet. The Project Manager will be notified immediately if any samples were damaged in shipment or if there is an indication of improper sampling or tampering with samples. Samples will then be moved to storage at 4 degrees celsius. All sample data will be entered into the laboratory management system. Laboratory sample ID's and notes will be entered on the BCA COC and submitted with the lab report documentation.

2.3 TRANSFER OF CUSTODY AND SHIPMENT

Samples remain in the custody of the sampler until a transfer of custody is completed. This consists of:

1. Delivery of samples to the laboratory sample custodian, and
2. Signature of laboratory sample custodian on chain-of-custody documents as receiving the samples and signature of sampler as relinquishing samples.
3. If a carrier is used to take samples between the sampler and the laboratory, the carrier may also sign the chain-of-custody form (as receiver from sampler and relinquisher to laboratory).

2.4 FINAL EVIDENCE FILES CHAIN-OF-CUSTODY

Unless specified in the QAPP BCA is the custodian of the evidence file. The evidence file is to include all reports; logs; field notebooks and other field records; pictures; contractor and subcontractor reports; correspondence; originals of laboratory reports, notebooks, and data; chain-of-custody documents; IDEM/EPA communications; and other records relevant to the project. The Project Manager must maintain the evidence file in a secured, limited access area until all submittals for the project, including the final reports:

(1) have been reviewed and approved by the IDEM/EPA, and
(2) for a minimum of three years past the submittal date of the final report.

3.0 CALIBRATION PROCEDURES AND FREQUENCY

Field Instruments/Equipment

Equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specification. Calibration frequency varies but must generally be performed at least daily.

Calibration of field instruments will be performed at the intervals specified by the manufacturer or more frequently as conditions dictate. Field instruments include an organic vapor Photoionization Detector (PID), multiparameter water quality instruments, water level meter or other field instruments. In the event that an internally calibrated field instrument fails to meet calibration/checkout procedures, it will be returned to the manufacturer or certified repair center for service.

The Photoionization Detector (PID) should be calibrated at the beginning of each day per manufacturer's instructions. The PID is zeroed on ambient air outside of any suspected impacted area. The span gas source is attached to the PID, the valve is opened and allowed 5-10 seconds to equilibrate. The PID is calibrated on 100 ppm Isobutylene span gas. However, since the gas measured is usually a mixture, the reading does not represent a specific concentration of a specific compound. In screening applications the actual numerical values recorded are of secondary importance, since there are no established U.S. EPA or IDEM standards for such readings. The relative magnitude of the values between samples and boring locations is considered to be of primary importance in screening for the presence of contaminated samples. In general, background levels would be 0-2 ppm but a slow response of up to 10 ppm may be observed due to moisture interference or natural soil organic matter. The PID must be allowed to return to zero between samples.

The multi-parameter water quality instrument (Sonde) is calibrated according to manufacturer instructions. The pH probe or meter is calibrated by means of 1 to 3 (pH 4, 7, & 10) point pH calibration and a daily single point (pH = 7.0) check or 2 point calibration as needed. The conductivity and ORP probes are calibrated against a single point traceable standard (1409 umho/cm for conductivity, 200 mV for ORP) on a routine basis (generally monthly) and checked with the standards before each deployment. Prior to and after each calibration standard, the probes and calibration cup are rinsed with distilled water. The dissolved oxygen probe or sensor is serviced and calibrated prior to each deployment. The DO probe is field calibrated by open cup 100% saturation on a daily basis prior to starting the sampling event.

4.0 INTERNAL QUALITY CONTROL CHECKS

Field Measurements

Quality control checks for field measurements (DQO=Level 1) include blanks, calibration checks and duplicates. QC checks for PID measurements include blanks between every sample, daily calibration checks and periodic (typically every 10-20 samples) duplicate measurements. Any other field methods (pH, ORP, conductivity) will include more frequent duplicates.

Field Instruments/Equipment Maintenance

Equipment to be used in the field sampling will be examined to certify that it is in operating condition. This includes checking the manufacturer's operating manual and the instructions for each instrument to ensure that maintenance requirements are being observed. Field notes from previous sampling trips will be reviewed so that the notations on any prior equipment problems are not overlooked and all necessary repairs to equipment have been carried out.

Field instruments will be maintained in accordance with manufacturers' recommendations. Rental instruments are cleaned and maintained by rental companies prior to delivery to BCA. PID field maintenance includes daily checks of the filter and cleaning or replacement as needed. The lamp will be checked periodically and cleaned as needed. The probes on water quality instruments and water level meters will be rinsed between each use and cleaned as needed. The batteries will be recharged daily or replaced as needed. The DO meter membrane will be replaced as needed.

5.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

Field Measurements

Precision

Precision is a measure of the degree of agreement between repeated measurements of the same parameter under prescribed, similar conditions. Mobile laboratory and field measurement precision shall be monitored through sample duplicate analyses or measurements. Precision results are expressed as relative percent difference (RPD). The RPD is calculated as follows:

$$RPD = \frac{(D1) - (D2)}{X} \times 100$$

Where:
RPD is the relative percent difference
D1 is the first duplicate value (percent recovery); and
D2 is the second duplicate value (percent recovery.
X is the mean or average of D1 and D2

Precision, accuracy and completeness criteria may be specified in the QAPP.

6.0 CORRECTIVE ACTION

Sample Collection/Field Measurement

Corrective action will be initiated whenever field sample collection or field measurement QC data fall outside acceptable limits. Corrective action involves cessation of sampling activity, review of protocol and (if possible) identification of the source. The validity of existing data will be evaluated and, if necessary, resampling may be performed.

7.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Field Data

Each mobile laboratory report will include QA data such as chromatograms, blanks, CCVs and duplicates as requested by the Project Manager. Field Instrument QA reports shall be prepared for the Project Manager by the Field Supervisor and shall be verbal in nature. QA reports shall note any deviations from the field QAPP, any QA/QC problems, solutions or results of corrective actions. Any identified field QA/QC problems which have identifiable impact on data quality (laboratory or field measurements) shall be noted in project documentation.

APPENDIX A

Certification Sheets for Calibration Standards for NITON XL3t

Table 2-6. High Standard - NIST # 2710

Element	Mass Fraction %	Variation %	Element	Mass Fraction µg/g	Variation µg/g
Aluminum	6.44	± 0.08	Antimony	38.4	± 3.0
Calcium	1.25	± 0.03	Arsenic	626.0	± 38.0
Iron	3.38	± 0.10	Barium	707.0	± 51.0
Magnesium	0.853	± 0.042	Cadmium	21.8	± 0.2
Manganese	1.01	± 0.04	Copper	2950.0	± 130.0
Phosphorus	0.106	± 0.015	Lead	5532.0	± 80.0
Potassium	2.11	± 0.11	Mercury	32.6	± 1.8
Silicon	28.97	± 0.18	Nickel	14.3	± 1.0
Sodium	1.14	± 0.06	Silver	35.3	± 1.5
Sulfur	0.240	± 0.006	Vanadium	76.6	± 2.3
Titanium	0.283	± 0.010	Zinc	6952.0	± 91.0

The complete Certificate of Analysis can be obtained from the NIST web site at: http://patapasco.nist.gov/smcatalog/certificates/2710.pdf

Table 2-7. Non-Certified Values - NIST Standard 2710

Element	Mass Fraction %	Element	Mass Fraction µg/g
Carbon	1	Bromine	6
		Cerium	57
		Cesium	107
		Chromium	39
		Cobalt	10
		Dysprosium	5.4
		Europium	1
		Gallium	34
		Gold	0.6
		Hafnium	3.2
		Holmium	0.6
		Indium	5.1
		Lanthanum	34
		Molybdenum	19
		Neodymium	23
		Rubidium	120
		Samarium	7.8
		Scandium	8.7
		Strontium	330
		Thallium	1.3
		Thorium	13
		Tungsten	93
		Uranium	25
		Ytterbium	1.3
		Yttrium	23

Table 2-10. Medium Standard - TILL-4 (Replaces NIST 2711)

Element	Mass Fraction %	Element	Mass Fraction μg/g
Fe	3.97	As	111
LOI (500°C)	4.4	Au	0.005
S	0.08	Ba	395
		Be	3.7
		Bi	40
		Br	8.6
		Ce	78
		Co	8
		Cr	53
		Cs	12
		Cu	237
		Eu	<1.0
		Er	3.2
		Hf	10
		La	41
		Li	30
		Lu	0.5
		Mn	490
		Mo	16
		Nb	15
		Nd	30
		Ni	17
		P	880
		Pb	50
		Rb	161
		Sb	1.0
		Sc	10
		Sm	6.1
		Sr	109
		Ta	1.6
		Tb	1.1

Table 2-10. Medium Standard - TILL-4 (Replaces NIST 2711)

Element	Mass Fraction %	Element	Mass Fraction µg/g
		Th	17.4
		Ti	4840
		U	5.0
		V	67
		W	204
		Y	33
		Yb	3.4
		Zn	70
		Zr	385

Replacement Standards for Discontinued NIST Samples

Table 2-9. Low Standard - NCS DC 73308 (Replaces NIST 2709)

Element	Mass Fraction µg/g	Variation µg/g
Ag	0.27	± 0.02
As	25	± 3.
Au		±
B	26	±4
Ba	42	±7
Be	0.9	± 0.2
Bi	0.38	± 0.04
Br	2.4	± 0.5
Cd	1.12	± 0.08
Ce	38	± 4
Cl	[53]	±
Co	15.3	± 1.1
Cr	136	± 10
Cs	2.3	±0 .5
Cu	22.6	+1.3
Dy	2.2	± 0.3
Er	1.3	± 0.2
Eu	0.47	± 0.04
F	149	± 25
Ga	6.4	± 0.7
Gd	2.2	± 0.2
Ge	0.40	± 0.06
Hf	1.8	± 0.4
Hg	0.28	± 0.03
Ho	0.45	± 0.07
I	1.6	± 0.3
In	0.067	± 0.016
La	13.0	± 0.9
Li	13.0	± 0.5
Lu	0.19	± 0.03
Mn	0.41010	± 29

Table 2-9. Low Standard - NCS DC 73308 (Replaces NIST 2709)

Element	Mass Fraction µg/g	Variation µg/g
Mo	1.2	± 0.1
N	[360]	±
Nb	6.8	± 1.3
Nd	11.8	± 1.1
Ni	30	± 2
P	271	± 15
Pb	27	± 2
Pr	3.2	± 0.4
Rb	9.2	± 1.5
S	[90]	±
Sb	6.3	± 0.6
Sc	4.1	± 0.4
Se	0.28	± 0.05
Sm	2.4	± 0.2
Sn	1.4	± 0.3
Sr	25	± 3
Ta	0.44	± 0.12
Tb	0.42	± 0.07
Te	0.08	± 0.02
Th	5.0	± 0.3
Ti	1270	± 70
Tl	0.21	± 0.05
Tm	0.20	± 0.03
U	2.1	± 0.2
V	107	± 5
W	1.6	± 0.3
Y	14	± 2
Yb	1.2	± 0.2
Zn	46	± 4
Zr	70	± 6

Data enclosed in brackets [x.y] are reference values.

APPENDIX B

Micro-Purge Sampling for Monitoring Wells (IDEM protocol)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Micro-Purge Sampling Option

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Guidance Created: June 3, 1998
Revised: November 3, 2009
Updated: December 12, 2017

Notice

The Technology Evaluation Group (TEG) completed this evaluation of *The Micro-Purge Sampling Option* based on professional expertise and review of items listed in the "References" section of this document. The criteria for performing the evaluation are generally described in the IDEM OLQ technical memorandum, *Submittal Guidance for Evaluation of Remediation Technologies*.

This evaluation does not verify the effectiveness of the sampling technique in conditions not identified here. Mention of trade names or commercial products does not constitute endorsement or recommendation by the IDEM for use.

Background

Most of today's well purging methods were developed during studies of water supply wells in the 1960's and early 1970's (Powell and Puls, 1997). The studied wells were usually steel-cased with screens set below the top of the water table, and were analyzed for inorganic water quality parameters.

The procedures used for sampling the water supply wells called for removing about three well volumes of water before sampling, because all the water in a well was thought to be "stagnant", and not representative of water in the aquifer. This purging or removal of the "stagnant" water was deemed necessary before taking "fresh" samples. These procedures have since been carried over into the sampling of groundwater monitoring wells.

Recent studies show the water within the screened section actually flows across the well with no significant mixing of water in the screened interval with the stagnant water above or below the screened interval. Development of the Micro-purge option is an attempt to prevents the mixing the stagnant water above the well screen with the "fresh" water within the screen interval. The TEG evaluation of the *Micro-Purge Sampling Option* is based upon analysis of parameters not associated with petroleum products (BTEX) in water collected from monitoring well screen intervals having stagnant water above the well screen.

Problems Encountered

Traditional purging methods of removing a prescribe amount of water from the monitoring well may present problems such as:

- Excessive agitation resulting in volatilization and degassing, which can underestimate contaminant concentrations;
- If the well is purged dry (common in Indiana's low permeable areas), the recharge water cascading through the sand filter pack can lose up to 70% of volatile organic compounds resulting in biased low VOC analyses (McAlary and Barker, 1987);
- Aeration can cause metals to precipitate out of solution resulting in biased low metals analyses (Puls and Powell, 1992);
- Preferential recharge from more porous layers, biasing the sample low;
- Increased turbidity from the disruption of the sand pack and surrounding soils which can bias the sample high;
- Increased amount of time and effort, resulting in increased labor expenses; and
- Disposal of large volumes of contaminated purge water at considerable handling expense and potential risk of additional spills.

Studies to determine actual well flow patterns, including direct observation of colloidal suspensions and dyes in wells, have changed previously held doctrine (Kearl, Korte and Cronk, 1992; Powell and Puls, 1993). Multiple studies have shown that while the water above and below a well screen may be stagnant, the water within the screened section actually flows across the well with no significant mixing of water in the screened interval with the stagnant water above or below. This holds true even for wells completed in low permeable materials (Robin and Gillham, 1987).

Therefore, a sample taken from the screened area only (excluding stagnant layers above and sediments below the screen) provides "fresh" water, representative of the aquifer. By removing the water as it comes into the well places less stress on the formation, and filtration may be eliminated due to marked decrease in turbidity (IDEM, 2005). Sediments below the screen can be avoided by restricting the depth of the sampling device. Stagnant water in the casing above the well screen is much more difficult to avoid, but dedicated pumps or careful, slow pump insertion will minimize mixing.

Research and testing of sampling procedures have focused on improving quality and the ease of sampling. Groundwater monitoring wells having a screen or open interval with a length of ten feet or less, which can accept a sampling device that minimizes the disturbance to the aquifer or the water column in the well casing, usually can use the micro-purge option. Procedures that minimize disturbance to the aquifer will yield consistently the most representative ground-water samples (EPA 542-S-02-001). The screen or open interval should have been optimally located to intercept an existing contaminant plume(s) or along flow paths of potential contaminant releases.

Micro-purge involves using an in-well pump, not to remove a set volume of water, but purging water at very low pumping rates (0.1 - 1.0 L/min) until showing that the water is being drawn from the aquifer. This is typically done by measured water quality characteristics until they exhibit steady-state conditions, which allows for less operator variability. This commonly creates less purge water to dispose of (95% less - Serlin & Kaplan, 1996). U.S.EPA recommends the most useful parameters are turbidity, dissolved oxygen, and oxidation-reduction potential. Parameters of less value, but often measured, are temperature, pH, and specific conductance (EPA/540/S-95/504).

Conclusions

The improvements in sample quality, particularly for metals analyses, are well-documented (Powell & Puls 1997, EPA/540/S-95/504) and micro-purge sampling is allowed in most states. The EPA has approved its use (EPA/540/S-95/504) and several Regions (I, VIII, and IX) have drafted standard operating procedures for micro-purge sampling. These sampling procedures have been approved and continue to be used successfully at many Indiana sites.

The use of micro-purge sampling at non-ELTF eligible sites has immense benefits in Indiana. In low producing confined aquifers, traditional purging is difficult or impossible without running the wells dry. This results in increased costs waiting for recharge and yields biased samples. Besides the money and time saved, the improvement in data consistency, accuracy and repeatability is particularly beneficial, especially when the public's health is involved. Case study information can be found in the Reference documents and in the IDEM Virtual File Cabinet (VFC).

The Office of Land Quality (OLQ), Science Services Branch has evaluated research and USEPA guidance on micro-purge (or low-flow) sampling; and concluded that this methodology can provide more consistent and reliable data than traditional methods, with a significant savings in time, money, and waste at non-ELTF eligible sites. The use of Micro-purge/Low flow sampling techniques is a viable option when sampling for chlorinated volatile organic compounds in groundwater, especially when delineating final extent of contamination or requesting unrestricted closure where lower concentrations are expected.

Conditions for Utilizing the Micro-Purge Sampling Option

- Consider the following when selecting equipment for the *Micro-Purge Sampling Option*:

  1. Commonly use down-hole bladder or centrifugal pumps.

2. Bailer moving up and down through the water column will mix the stagnant water with the fresh water making it difficult to collect a representative sample.

3. Inertial lift devices and high flow rate pumps may inadvertently mix the water in the well casing.

4. Using a multi-probe, in-line flow cell, preferably transparent (to detect particulate build-up) is beneficial to use. The design of the flow cell will prevent air bubble entrapment during use. Listing the types of flow cells and multi-probes used, as well as information on how often the multi-probes were calibrated is beneficial in evaluating the sampling procedure.

5. Tubing typically used is small diameter (1/4 or 3/8 inch) Teflon or Teflon-lined polyethylene. Select tubing material based on the sample analyses

- Consider the following when using the *Micro-Purge Sampling Option*:

1. Indiana Water Well Drilling Rules 312 IAC 13, requires monitoring well to be permanent, properly constructed, and developed.

2. If a dedicated pump is not feasible, then use dedicated tubing, cut to length for that well. The use of a portable pump will require a longer purge time for stabilization. It should be lowered into place as slowly as possible to prevent mixing or surging of the well.

3. The midpoint of the saturated screen is usually the optimum depth for the pump intake, but other depths may be used to target specific zones, such as maximum flow layers or zones of high chemical concentrations. Pump intake close to the surface water level may pull the water level below the intake. Pump intake close to the bottom of the well create excess turbidity from the well bottom. Provide detailed information outlining why, how and where each pump intake depth was selected.

4. Keep pump stationary while taking samples.

5. Take continual water level readings during purging.

6. Establish a drawdown target/action point during purging. During initial pump start-up, drawdown may temporarily exceed this, before recovery. The water level readings should be recorded and any drawdown exceeding drawdown target level is noted in the field record, along with any corrective actions taken.

7. Prepare alternative procedures to prevent the water level being pulled down to the pump intake during the next sampling period.

8. Start the pump at the lowest flow volume, and adjusted higher as long as the maximum drawdown is not exceeded. Typical extraction volumes are 100 ml/min to 300 ml/min. Volumes may approach 1.0 L/min in very highly permeable soils.

9. The parameters normally measured for stability (listed in increasing order of sensitivity) are pH, temperature, specific conductivity, oxygen-reduction (redox) potential, dissolved oxygen (DO) and turbidity. The frequency of measurements will depend on the rate of sampling, but should generally be on the order of three to five minutes. Stability will be achieved when three consecutive readings do not vary more than ± 10% for turbidity and DO, ± 3% for conductivity and temperature, ± 10 millivolts for redox, and ± 0.1 for pH.

10. Lower the pumping rate if, during purging, the turbidity readings increase, this indicates that the well is being re-developed. Consider re-developing the monitoring well if turbidity does not stabilize at or below 5 NTU.

11. Possible options for the sampler if the well yield (recharge rate) is lower than the lowest extraction rate and the target drawdown cannot be met may include:
    - Continue to purge to stabilization with note of variation from the plan or allowing a larger drawdown;
    - Based on the excessive screen length allow 25% of distance between the pump intake and the top of screen (Nielsen 2010, and ASTM 6771-02 suggest this standard).
    - If low hydraulic conductivity is a problem (such as in drought conditions), switch to no-flow or passive sampling (i.e., Diffusion Bag samplers, GORE® Modules can be used).

12. The sampling team review the methodology and procedures to be used and how sample variations will be handled in the field.

13. Sampling field data may be recorded via hand-written sheets/forms or automated electronic data storage and reporting.

Further Information

This document is not a complete outline of sampling procedures; for that refer to USEPA EPA/540/S-95/504 or EPA groundwater sampling guidance at http://www.epa.gov/sites/production/files/2015-06/documents/gw_sampling_guide.pdf

If you have any additional information regarding this technology or any questions about the evaluation, please contact the Office of Land Quality (OLQ), Science Services Branch (SSB) at (317) 232-3215. This technical guidance document will be updated periodically or when new information is acquired.

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U. S. EPA Region I 2010. Low Stress (low flow) Purging and Sampling Procedures for the Collection of Ground Water Samples from Monitoring Wells. Revision 3, 30 p.

U. S. EPA Region IX 1995. Use of Low-Flow Methods for Ground Water Purging and Sampling: An Overview. 4 p.

U. S. EPA Region VIII 1994. Standard Operating Procedure for Well Purging. SOP #4.1, Revision 0, 22 p.

APPENDIX C

Performance Characteristics of Heuresis Model Pb 200i (XRF) Lead Analyzer

Performance Characteristic Sheet

EFFECTIVE DATE: **December 1, 2015**

MANUFACTURER AND MODEL:

Make: ***Heuresis***
Models: ***Model Pb200i***
Source: ***^{57}Co, 5 mCi (nominal – new source)***

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Action Level mode

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm^2 (inclusive)

SUBSTRATE CORRECTION:

Not applicable

INCONCLUSIVE RANGE OR THRESHOLD:

ACTION LEVEL MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm^2)
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated using test results on building components in the HUD archive. Testing was conducted on 146 test samples in November 2015, with two separate instruments running software version 2.1-2 in Action Level test mode. The actual source strength of each instrument on the day of testing was approximately 2.0 mCi; source ages were approximately one year.

OPERATING PARAMETERS

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

XRF CALIBRATION CHECK:

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm^2 in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm^2 film).

If the average (rounded to 1 decimal place) of three readings is outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instrument into control before XRF testing proceeds.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Chapter 7 of the HUD Guidelines provides guidance on correcting XRF results for substrate bias. Supplemental guidance for using the paint film nearest 1.0 mg/cm^2 for substrate correction is provided:

XRF results are corrected for substrate bias by subtracting from each XRF result a correction value determined separately in each house for single-family housing or in each development for multifamily housing, for each substrate. The correction value is an average of XRF readings taken over the NIST SRM paint film nearest to 1.0 mg/cm^2 at test locations that have been scraped bare of their paint covering. Compute the correction values as follows:

> Using the same XRF instrument, take three readings on a bare substrate area covered with the NIST SRM paint film nearest 1 mg/cm^2. Repeat this procedure by taking three more readings on a second bare substrate area of the same substrate covered with the NIST SRM.
>
> Compute the correction value for each substrate type where XRF readings indicate substrate correction is needed by computing the average of all six readings as shown below.
>
> For each substrate type (the 1.02 mg/cm^2 NIST SRM is shown in this example; use the actual lead loading of the NIST SRM used for substrate correction):
>
> Correction value = (1st + 2nd + 3rd + 4th + 5th + 6th *Reading*)/6 - 1.02 mg/cm^2
>
> Repeat this procedure for each substrate requiring substrate correction in the house or housing development.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing.

Conduct XRF re-testing at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below.

Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family and multi-family housing, a result is defined as a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and the retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF readings.

Compute the average of all ten re-test XRF readings.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

In the Action Level paint test mode, the instrument takes the longest time to complete readings close to the Federal standard of 1.0 mg/cm^2. The table below shows the mean and standard deviation of actual reading times by reading level for paint samples during the November 2015 archive testing. The tested instruments reported readings to one decimal place. No significant differences in reading times by substrate were observed. These times apply only to instruments with the same source strength as those tested (2.0 mCi). Instruments with stronger sources will have shorter reading times and those with weaker sources, longer reading times, than those in the table.

Mean and Standard Deviation of Reading Times in Action Level Mode by Reading Level		
Reading (mg/cm^2)	**Mean Reading Time (seconds)**	**Standard Deviation (seconds)**
< 0.7	3.48	0.47
0.7	7.29	1.92
0.8	13.95	1.78
0.9 – 1.2	15.25	0.66
1.3 – 1.4	6.08	2.50
$\geq$ 1.5	3.32	0.05

CLASSIFICATION OF RESULTS:

XRF results are classified as **positive** if they are **greater than or equal** to the stated threshold for the instrument (1.0 mg/cm^2), and *negative* if they are *less than* the threshold.

DOCUMENTATION:

A report titled *Methodology for XRF Performance Characteristic Sheets* (EPA 747-R-95-008) provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. The report may be downloaded at http://www2.epa.gov/lead/methodology-xrf-performance-characteristic-sheets-epa-747-r-95-008-september-1997.

This XRF Performance Characteristic Sheet (PCS) was developed by QuanTech, Inc., under a contract with the XRF manufacturer.

Appendix L

Treatability Study Results

Remediation Work Plan
Former Exide Corporation
303 Water Street
Logansport, IN 46947

REDOX TECH, LLC

"Providing Innovative In Situ Soil and Groundwater Treatment"

Treatability Study Report
for
Lead Stabilization, Logansport, IN

Prepared for
BCA Environmental Consultants, LLC

April 1, 2024

1. Introduction

BCA Environmental Consultants contracted Redox Tech to prepare a treatability study to evaluate the alternatives for stabilizing lead at a site in Logansport, Indiana. The goal of the stabilization work is to reduce lead levels from a Toxicity Characteristic Leach Procedure (TCLP) to below 5 parts per million (ppm). Samples were collected from two zones. Zone 1 was less impacted with lead than Zone 2.

2. Test Method

Samples were received from two zones and thoroughly mixed prior to testing. The pH on untreated samples was measured prior to treatment. Four different products (or mixtures) were tested for stabilizing the lead. The commercially available products Blastox and TerraBond were tested along with a custom blend of blast furnace slag plus magnesium oxide, and a custom blend of magnesium oxide and sodium tripolyphosphate. Each product was initially tested at three different concentrations. However, after the first round of testing was completed, none of the products met the treatment goals. Therefore, another round of testing was completed on the most viable products from the first round.

To complete the testing, reaction vessels were prepared with a 200-gram aliquot of soil and the reagents at the specified concentration in a 4-oz jar. Deionized water was added to the point of visual saturation. Thereafter, the soil and amendment mixtures were mixed thoroughly. The samples were allowed to react for three weeks, and then sent to an outside laboratory for pH, moisture and TCLP for lead analyses.

3. Test Results

The results of the TCLP testing for lead are reported in Table 1. All of the results are reported on a dry basis (moisture content was measured). The untested sample TCLP results are reported as “Untreated Controls.” As expected, Zone 2 had higher baseline TCLP levels for lead. Both untreated Zones failed TCLP. TerraBond added at 5 weight percent was the only treatment that sufficiently stabilized lead. The pH of the samples treated with TerraBond was just over 8 s.u. The results for the other treatment regimes were highly variable, and often increased leachable lead over baseline levels.

TerraBond is recommended for full scale implementation.

Table 1. Logansport IN TCLP for Lead Results

Soil Location	Untreated Control	Blastox® (1% w/w)	Blastox® (2% w/w)	Blastox® (3% w/w)	TerraBond® (1% w/w)	TerraBond® (2% w/w)	TerraBond® (3% w/w)	TerraBond® (5% w/w)	BFS + MagOx (1% w/w)	BFS + MagOx (2% w/w)	BFS + MagOx (3% w/w)	Phosphate + MagOx (0.5% w/w)	Phosphate + MagOx (1% w/w)	Phosphate + MagOx (2% w/w)	Phosphate + MagOx (3% w/w)	Phosphate + MagOx (5% w/w)
Zone 1	13.6	11.8	8.75	4.13	15.7	12.2	5.14	1.94	10.6	7.74	3.54	9.3	9.2	2.72	16.4	23.6
Zone 2	64.5	53.1	48.6	27.8	39.3	24.4	3.39	0.931	40.8	36.2	12.0	33.4	24.5	7.64	24.4	19

SRN Testing Services, LLC
2258 Southwind Blvd.
Bartlett, IL 60103
TEL: (630) 503-5002
Website: www.srntest.com

January 22, 2024

John Haselow
ReDox Tech
200 Quade Rd.
Cary, NC 27513
TEL:
FAX

RE: Treatability Study

Order No.: 2401003

Dear John Haselow:

SRN Testing Services received 26 samples for the referenced project on 1/9/2024. The analytical results are presented in the following report.

Unless indicated in the Case Narrative, all analyses were performed using established procedures, in accordance with the quality system, and within holding time. Observations regarding sample or analytical response are also noted in the Case Narrative where applicable.

Thank you for choosing SRN Testing Services to provide your environmental testing and analyses. If you have questions regarding the enclosed materials, please contact me.

Sincerely,

Ryan Serafino

2258 Southwind Blvd.
Bartlett, IL 60103

SRN Testing Services, LLC
2258 Southwind Blvd.
Bartlett, IL 60103
TEL: (630) 503-5002
Website: www.srntest.com

Workorder Sample Summary

WO#: **2401003**

22-Jan-24

CLIENT: ReDox Tech
Project: Treatability Study

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
2401003-001	RT-UN-C0-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-002	RT-UN-C0-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-003	RT-BX-C1-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-004	RT-BX-C1-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-005	RT-BX-C2-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-006	RT-BX-C2-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-007	RT-BX-C3-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-008	RT-BX-C3-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-009	RT-TB-C1-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-010	RT-TB-C1-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-011	RT-TB-C2-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-012	RT-TB-C2-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-013	RT-TB-C3-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-014	RT-TB-C3-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-015	RT-FM-C1-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-016	RT-FM-C1-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-017	RT-FM-C2-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-018	RT-FM-C2-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-019	RT-FM-C3-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-020	RT-FM-C3-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-021	RT-MP-C1-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-022	RT-MP-C1-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-023	RT-MP-C2-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-024	RT-MP-C2-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-025	RT-MP-C3-Zone 1		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid
2401003-026	RT-MP-C3-Zone 2		12/21/2023 1:00:00 PM	1/9/2024 1:20:00 PM	Solid

SRN Testing Services, LLC
2258 Southwind Blvd.
Bartlett, IL 60103
TEL: (630) 503-5002
Website: www.srntest.com

Case Narrative

WO#: **2401003**
Date: **1/22/2024**

CLIENT: ReDox Tech
Project: Treatability Study

Sample Receipt and Login:
Samples have higher than usual percent moisture content for TCLP analysis which can bias concentrations high if calculated similar to dry-weight results. The application of percent moisture to a TCLP extract result assumes that the additional liquid does not contain the contaminant, which cannot be ascertained using single phase TCLP analysis. Since the soil maintained suspension at room temperature for the method-required timeframe, the TCLP analysis was performed as a single phase sample.

Additional TCLP preliminary determination information is included at the end of the report.

2401003: The samples were received outside acceptance temperature with evidence of cooling. The samples were chilled upon receipt into the laboratory.

2401003: H-Flag: The samples were received out of holding time for pH analysis. The method considers this a field test. Samples are accepted as treatability study.

2401003: H-Flag: The samples were received out of holding time for percent moisture analysis. Samples are accepted as treatability study.

Sample Analysis:
2401003: Samples were analyzed at SRN Testing Services, LLC for:
  TCLP Analysis by ICPMS - SW-846 6020B
  pH @ 25C of Soil - SW-846 9045D
  Percent Moisture - SM 2540G

Analytical Comments:
Analytical Comments for Test ICPMS_TCLP, Analytical RunNo 801 , Batch ID 580:
  Sample 2401003-001MS/MSD: Q-Flag: MS/MSD recovered outside of acceptance criteria for Lead due to the high concentration in the original sample. Results accepted as flagged.

SRN Testing Services, LLC
2258 Southwind Blvd.
Bartlett, IL 60103
TEL: (630) 503-5002
Website: www.srntest.com

Case Narrative

WO#: **2401003**
Date: **1/22/2024**

CLIENT: ReDox Tech
Project: Treatability Study

Analytical Comments for Test ICPMS_TCLP, Analytical RunNo 801 , Batch ID 581:
Sample 2401003-015MS/MSD: Q-Flag: MS/MSD recovered outside of acceptance criteria for Lead due to the high concentration in the original sample. Results accepted as flagged.

Analytical Comments for Test PH_S, Analytical RunNo 793:
E-Flag: Recorded pH value over linear calibration range. Measurement is considered an approximation.

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TEL: (630) 503-5002
Website: www.srntest.com

Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Project: Treatability Study

Lab ID: 2401003-001

Client Sample ID RT-UN-C0-Zone 1

Collection Date: 12/21/2023 1:00:00 PM

Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	13.6	0.100		mg/L	10	1/17/2024 11:33:30 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	27.8	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	7.412	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT:	ReDox Tech	**Collection Date:**	12/21/2023 1:00:00 PM
Project:	Treatability Study		
Lab ID:	2401003-002	**Matrix:**	SOLID
Client Sample ID	RT-UN-C0-Zone 2		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B**	**SW3015A**	Analyst: **RS**
Lead	64.5	1.00		mg/L	100	1/17/2024 11:46:45 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	30.8	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	7.443	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-003

Matrix: SOLID

Client Sample ID RT-BX-C1-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	11.8	0.100		mg/L	10	1/17/2024 11:36:10 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	32.6	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	11.18	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech
Collection Date: 12/21/2023 1:00:00 PM
Project: Treatability Study
Lab ID: 2401003-004
Matrix: SOLID
Client Sample ID RT-BX-C1-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	53.1	1.00		mg/L	100	1/17/2024 11:49:24 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	27.3	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	11.21	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report
(consolidated)

WO#: **2401003**
Date Reported: **1/22/2024**

CLIENT: ReDox Tech
Project: Treatability Study
Lab ID: 2401003-005
Client Sample ID RT-BX-C2-Zone 1

Collection Date: 12/21/2023 1:00:00 PM
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	8.75	0.100		mg/L	10	1/17/2024 11:38:48 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	29.8	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	11.72	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-006

Matrix: SOLID

Client Sample ID RT-BX-C2-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B**	**SW3015A**	Analyst: **RS**
Lead	48.6	1.00		mg/L	100	1/17/2024 11:52:04 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	26.9	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	11.74	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-007

Matrix: SOLID

Client Sample ID RT-BX-C3-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B**	**SW3015A**	Analyst: **RS**
Lead	4.13	0.0500		mg/L	5	1/17/2024 10:56:32 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	28.9	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	12.20	0.1000	E	pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-008

Matrix: SOLID

Client Sample ID RT-BX-C3-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	27.8	1.00		mg/L	100	1/17/2024 11:54:41 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	25.7	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	12.01	0.1000	E	pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-009

Matrix: SOLID

Client Sample ID RT-TB-C1-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	15.7	0.100		mg/L	10	1/17/2024 11:41:28 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	30.9	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.251	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech | **Collection Date:** 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-010 | **Matrix:** SOLID

Client Sample ID RT-TB-C1-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B**	**SW3015A**	Analyst: **RS**
Lead	39.3	1.00		mg/L	100	1/17/2024 11:57:22 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	26.2	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.151	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Project: Treatability Study

Lab ID: 2401003-011

Client Sample ID RT-TB-C2-Zone 1

Collection Date: 12/21/2023 1:00:00 PM

Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	12.2	0.100		mg/L	10	1/17/2024 11:44:06 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	29.0	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.176	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-012

Matrix: SOLID

Client Sample ID RT-TB-C2-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	24.4	1.00		mg/L	100	1/17/2024 12:13:14 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	28.7	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.244	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report
(consolidated)

WO#: **2401003**
Date Reported: **1/22/2024**

CLIENT: ReDox Tech
Project: Treatability Study
Lab ID: 2401003-013
Client Sample ID RT-TB-C3-Zone 1
Collection Date: 12/21/2023 1:00:00 PM
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	5.14	0.0500		mg/L	5	1/17/2024 11:15:01 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	29.1	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.193	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-014

Matrix: SOLID

Client Sample ID RT-TB-C3-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	3.39	0.0500		mg/L	5	1/17/2024 11:17:38 AM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	26.9	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.283	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech **Collection Date:** 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-015 **Matrix:** SOLID

Client Sample ID RT-FM-C1-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	10.6	0.0500		mg/L	5	1/17/2024 12:31:46 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	29.0	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.779	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

Original

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-016

Matrix: SOLID

Client Sample ID RT-FM-C1-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	40.8	1.00		mg/L	100	1/17/2024 1:43:15 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	29.0	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.836	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-017

Matrix: SOLID

Client Sample ID RT-FM-C2-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	7.74	0.0500		mg/L	5	1/17/2024 12:47:38 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	28.6	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.048	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN testing

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-018

Matrix: SOLID

Client Sample ID RT-FM-C2-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	36.2	1.00		mg/L	100	1/17/2024 1:45:53 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	24.6	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.960	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Project: Treatability Study

Lab ID: 2401003-019

Client Sample ID RT-FM-C3-Zone 1

Collection Date: 12/21/2023 1:00:00 PM

Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	3.54	0.0500		mg/L	5	1/17/2024 12:52:56 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	28.5	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.031	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

Original

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Analytical Report

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WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Project: Treatability Study

Lab ID: 2401003-020

Client Sample ID RT-FM-C3-Zone 2

Collection Date: 12/21/2023 1:00:00 PM

Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	12.0	0.100		mg/L	10	1/17/2024 1:40:35 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	27.9	0.100		wt%	1	1/10/2024 10:39:03 AM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.915	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

SRN Testing Services, LLC
2258 Southwind Blvd.
Bartlett, IL 60103
TEL: (630) 503-5002
Website: www.srntest.com

Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-021

Matrix: SOLID

Client Sample ID RT-MP-C1-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	9.30	0.0500		mg/L	5	1/17/2024 1:11:30 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	30.3	0.100		wt%	1	1/11/2024 2:04:59 PM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	8.755	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**
Date Reported: **1/22/2024**

CLIENT: ReDox Tech
Collection Date: 12/21/2023 1:00:00 PM
Project: Treatability Study
Lab ID: 2401003-022
Matrix: SOLID
Client Sample ID RT-MP-C1-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	33.4	1.00		mg/L	100	1/17/2024 1:48:33 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	28.7	0.100		wt%	1	1/11/2024 2:04:59 PM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.124	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-023

Matrix: SOLID

Client Sample ID RT-MP-C2-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	9.20	0.0500		mg/L	5	1/17/2024 1:16:48 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	31.6	0.100		wt%	1	1/11/2024 2:04:59 PM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.303	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech | **Collection Date:** 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-024 | **Matrix:** SOLID

Client Sample ID RT-MP-C2-Zone 2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	24.5	1.00		mg/L	100	1/17/2024 1:51:12 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	27.7	0.100		wt%	1	1/11/2024 2:04:59 PM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.222	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT: ReDox Tech

Collection Date: 12/21/2023 1:00:00 PM

Project: Treatability Study

Lab ID: 2401003-025

Matrix: SOLID

Client Sample ID RT-MP-C3-Zone 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B SW3015A**		Analyst: **RS**
Lead	2.72	0.0500		mg/L	5	1/17/2024 1:22:04 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	31.3	0.100		wt%	1	1/11/2024 2:04:59 PM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.398	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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Analytical Report

(consolidated)

WO#: **2401003**

Date Reported: **1/22/2024**

CLIENT:	ReDox Tech	**Collection Date:**	12/21/2023 1:00:00 PM
Project:	Treatability Study		
Lab ID:	2401003-026	**Matrix:**	SOLID
Client Sample ID	RT-MP-C3-Zone 2		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP ANALYSIS BY ICPMS				**SW-846 6020B**	**SW3015A**	Analyst: **RS**
Lead	7.64	0.0500		mg/L	5	1/17/2024 1:24:42 PM
PERCENT MOISTURE				**SM 2540G**		Analyst: **AD**
Percent Moisture	26.7	0.100		wt%	1	1/11/2024 2:04:59 PM
PH @ 25C OF SOIL				**SW-846 9045D**		Analyst: **AD**
PH	9.366	0.1000		pH Units	1	1/11/2024 11:26:00 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
PRE	Percent RE exceeds the Limit	T	Tentatively identified compounds

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QC SUMMARY REPORT

WO#: **2401003**

22-Jan-24

Client: ReDox Tech

Project: Treatability Study

TestCode: ICPMS_TCLP

Sample ID: **MB-580** SampType: **MBLK** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/16/2024** RunNo: **801**
Client ID: **PBW** Batch ID: **580** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20724**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.000213	0.0500									J

Sample ID: **LCS-580** SampType: **LCS** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/16/2024** RunNo: **801**
Client ID: **LCSW** Batch ID: **580** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20725**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.117	0.0500	0.125	0	93.7	79.5	120.49				

Sample ID: **2401003-001AMS** SampType: **MS** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/16/2024** RunNo: **801**
Client ID: **RT-UN-C0-Zone 1** Batch ID: **580** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20729**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	13.2	0.0500	0.125	13.2	-28.2	69.5	130.49				EQ

Sample ID: **2401003-001AMSD** SampType: **MSD** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/16/2024** RunNo: **801**
Client ID: **RT-UN-C0-Zone 1** Batch ID: **580** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20730**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	13.2	0.0500	0.125	13.2	38.5	69.5	130.49	13.2	0.632	20	EQ

Qualifiers:

B	Analyte detected in the associated Method Blank	B	MBLK Samptype result is greater than 1/2 PQL.	J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit	PRE	Percent RE exceeds the Limit	Q	Spike Recovery outside acceptance criteria
R	RPD outside accepted recovery limits				

Original

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QC SUMMARY REPORT

WO#: **2401003**

22-Jan-24

Client: ReDox Tech

Project: Treatability Study

TestCode: **ICPMS_TCLP**

Sample ID: **MB-581** SampType: **MBLK** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/17/2024** RunNo: **801**
Client ID: **PBW** Batch ID: **581** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20775**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.00336	0.0500									J

Sample ID: **LCS-581** SampType: **LCS** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/17/2024** RunNo: **801**
Client ID: **LCSW** Batch ID: **581** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20776**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.122	0.0500	0.125	0	97.8	79.5	120.49				

Sample ID: **2401003-015AMS** SampType: **MS** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/17/2024** RunNo: **801**
Client ID: **RT-FM-C1-Zone 1** Batch ID: **581** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20780**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	11.0	0.0500	0.125	10.6	335	69.5	130.49				Q

Sample ID: **2401003-015AMSD** SampType: **MSD** TestCode: **ICPMS_TCLP** Units: **mg/L** Prep Date: **1/17/2024** RunNo: **801**
Client ID: **RT-FM-C1-Zone 1** Batch ID: **581** TestNo: **SW6020A** **SW3015A** Analysis Date: **1/17/2024** SeqNo: **20781**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	11.0	0.0500	0.125	10.6	325	69.5	130.49	11.0	0.113	20	Q

Qualifiers:

B	Analyte detected in the associated Method Blank	B	MBLK Samptype result is greater than 1/2 PQL.	J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit	PRE	Percent RE exceeds the Limit	Q	Spike Recovery outside acceptance criteria
R	RPD outside accepted recovery limits				

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QC SUMMARY REPORT

WO#: **2401003**

22-Jan-24

Client: ReDox Tech

Project: Treatability Study

TestCode: **PH_S**

Sample ID: **2401003-001ADUP** SampType: **DUP** TestCode: **PH_S** Units: **pH Units** Prep Date: **1/11/2024** RunNo: **793**

Client ID: **RT-UN-C0-Zone 1** Batch ID: **R793** TestNo: **SW9045** Analysis Date: **1/11/2024** SeqNo: **20599**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
PH	7.488	0.1000						7.412	1.02	20	

Sample ID: **2401003-021ADUP** SampType: **DUP** TestCode: **PH_S** Units: **pH Units** Prep Date: **1/11/2024** RunNo: **793**

Client ID: **RT-MP-C1-Zone 1** Batch ID: **R793** TestNo: **SW9045** Analysis Date: **1/11/2024** SeqNo: **20622**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
PH	8.774	0.1000						8.755	0.217	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	B	MBLK Samptype result is greater than 1/2 PQL.	J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit	PRE	Percent RE exceeds the Limit	Q	Spike Recovery outside acceptance criteria
R	RPD outside accepted recovery limits				

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QC SUMMARY REPORT

WO#: **2401003**
22-Jan-24

Client: ReDox Tech
Project: Treatability Study
TestCode: **PMOIST**

Sample ID: **MB-R792** SampType: **MBLK** TestCode: **PMOIST** Units: **wt%** Prep Date: **1/10/2024** RunNo: **792**
Client ID: **PBS** Batch ID: **R792** TestNo: **D2216** Analysis Date: **1/10/2024** SeqNo: **20570**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	< 0.100	0.100									

Sample ID: **2401003-001ADUP** SampType: **DUP** TestCode: **PMOIST** Units: **wt%** Prep Date: **1/10/2024** RunNo: **792**
Client ID: **RT-UN-C0-Zone 1** Batch ID: **R792** TestNo: **D2216** Analysis Date: **1/10/2024** SeqNo: **20572**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	31.3	0.100						27.81	11.9	20	

Sample ID: **2401003-011ADUP** SampType: **DUP** TestCode: **PMOIST** Units: **wt%** Prep Date: **1/10/2024** RunNo: **792**
Client ID: **RT-TB-C2-Zone 1** Batch ID: **R792** TestNo: **D2216** Analysis Date: **1/10/2024** SeqNo: **20583**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	28.5	0.100						29.03	1.73	20	

Sample ID: **MB-R794** SampType: **MBLK** TestCode: **PMOIST** Units: **wt%** Prep Date: **1/11/2024** RunNo: **794**
Client ID: **PBS** Batch ID: **R794** TestNo: **D2216** Analysis Date: **1/11/2024** SeqNo: **20629**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	< 0.100	0.100									

Qualifiers:

B	Analyte detected in the associated Method Blank	B	MBLK Samptype result is greater than 1/2 PQL.	J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit	PRE	Percent RE exceeds the Limit	Q	Spike Recovery outside acceptance criteria
R	RPD outside accepted recovery limits				

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QC SUMMARY REPORT

WO#: **2401003**
22-Jan-24

Client: ReDox Tech
Project: Treatability Study **TestCode:** **PMOIST**

Sample ID: **2401003-021ADUP**	SampType: **DUP**	TestCode: **PMOIST**	Units: **wt%**		Prep Date: **1/11/2024**			RunNo: **794**			
Client ID: **RT-MP-C1-Zone 1**	Batch ID: **R794**	TestNo: **D2216**			Analysis Date: **1/11/2024**			SeqNo: **20631**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	31.1	0.100						30.25	2.66	20	

Qualifiers:

B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
B MBLK Samptype result is greater than 1/2 PQL.
PRE Percent RE exceeds the Limit
J Analyte detected below quantitation limits
Q Spike Recovery outside acceptance criteria

FTK-010 Rev5 - TCLP and SPLP Benchsheet

Prep Batch ID	578
Analyst	RS
Start Date & Time	1/15/24 3:30 PM
End Date & Time	1/16/24 7:55 AM
18 Hours from Start Time	9:30:00 AM *± 2 hours*
RPM of Rotator (30 ± 2)	30
Water Bath Temp (°C)	49

Reagent	SRN ID	Expires
1 N HCl	G-106	9/29/2024
TCLP Fluid 1	M-253	5/2/2025
SPLP Fluid 1	N/A	N/A

pH Verification	Pre-Tumble*	Post-Tumble*
pH 2	2.001	N/A
pH 4	4.038	3.999
pH 7	7.049	7.034
pH 10	N/A	N/A
pH 12	N/A	N/A

**complete as needed*

Consumables	Lot Number
100 mL Tubes	2206050-3165-IM
TCLP 0.7 um Filters	400216-3306-AJ

Sample ID	Particle Size Reduction (Y/N)	Bottle	Preliminary Determination pH	Fluid Used	Fluid Volume (mL)	Comments
MB-578	N	B34	N/A	TCLP 1	2000	
2401003-001A	N	B48	2.022	TCLP 1	2000	
2401003-002A	N	B19	2.74	TCLP 1	2000	
2401003-003A	N	B47	2.167	TCLP 1	2000	
2401003-004A	N	B6	3.633	TCLP 1	2000	
2401003-005A	N	B36	2.205	TCLP 1	2000	
2401003-006A	N	B29	3.848	TCLP 1	2000	
2401003-007A	N	B3	2.673	TCLP 1	2000	
2401003-008A	N	B2	3.526	TCLP 1	2000	
2401003-009A	N	B4	2.059	TCLP 1	2000	
2401003-010A	N	B32	2.732	TCLP 1	2000	
2401003-011A	N	B1	2.18	TCLP 1	2000	
2401003-012A	N	B5	3.62	TCLP 1	2000	
2401003-013A	N	B16	2.453	TCLP 1	2000	
2401003-014A	N	B41	4.11	TCLP 1	2000	

SRN Testing Services, LLC

PREP BATCH REPORT

Prep Start Date: **1/15/2024 3:30:00 P**
Prep End Date: **1/16/2024 7:55:00 A**

Prep Factor Units: **mL / g**

Prep Batch ID: **578** Prep Code: **PREP_TCLP** Method No: **SW-846 1311** Technician: **Ryan Serafino**

Initial Temp: **22 °C** Final Temp: **23 °C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-578		Solid	4.974	4.921	100	0	0	2000	20.000	1/15/2024	1/16/2024
2401003-001A	RT-UN-C0-Zone 1	Solid		5.854	100.03	0	0	2000	19.994	1/15/2024	1/16/2024
2401003-002A	RT-UN-C0-Zone 2	Solid		5.67	100.04	0	0	2000	19.992	1/15/2024	1/16/2024
2401003-003A	RT-BX-C1-Zone 1	Solid		5.885	100.49	0	0	2000	19.902	1/15/2024	1/16/2024
2401003-004A	RT-BX-C1-Zone 2	Solid		5.674	100.12	0	0	2000	19.976	1/15/2024	1/16/2024
2401003-005A	RT-BX-C2-Zone 1	Solid		6.083	100.16	0	0	2000	19.968	1/15/2024	1/16/2024
2401003-006A	RT-BX-C2-Zone 2	Solid		5.939	100.18	0	0	2000	19.964	1/15/2024	1/16/2024
2401003-007A	RT-BX-C3-Zone 1	Solid		6.619	100.49	0	0	2000	19.902	1/15/2024	1/16/2024
2401003-008A	RT-BX-C3-Zone 2	Solid		6.564	100.35	0	0	2000	19.930	1/15/2024	1/16/2024
2401003-009A	RT-TB-C1-Zone 1	Solid		5.883	100.34	0	0	2000	19.932	1/15/2024	1/16/2024
2401003-010A	RT-TB-C1-Zone 2	Solid		5.827	100.17	0	0	2000	19.966	1/15/2024	1/16/2024
2401003-011A	RT-TB-C2-Zone 1	Solid		5.914	100.08	0	0	2000	19.984	1/15/2024	1/16/2024
2401003-012A	RT-TB-C2-Zone 2	Solid		5.897	100.16	0	0	2000	19.968	1/15/2024	1/16/2024
2401003-013A	RT-TB-C3-Zone 1	Solid		5.948	100.06	0	0	2000	19.988	1/15/2024	1/16/2024
2401003-014A	RT-TB-C3-Zone 2	Solid		6.067	100.18	0	0	2000	19.964	1/15/2024	1/16/2024

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

FTK-010 Rev5 - TCLP and SPLP Benchsheet

Prep Batch ID	579
Analyst	RS
Start Date & Time	1/16/24 3:20 PM
End Date & Time	1/17/24 8:05 AM
18 Hours from Start Time	9:20:00 AM
RPM of Rotator (30 ± 2)	30
Water Bath Temp (°C)	49.2

± 2 hours

Consumables	Lot Number
100 mL Tubes	2206050-3165-IM
TCLP 0.7 um Filters	400216-3306-AJ

Reagent	SRN ID	Expires
1 N HCl	G-106	9/29/2024
TCLP Fluid 1	M-253,M-254	5/2/2025
SPLP Fluid 1	N/A	N/A

pH Verification	Pre-Tumble*	Post-Tumble*
pH 2	N/A	N/A
pH 4	4.038	4.012
pH 7	7.049	7.025
pH 10	N/A	N/A
pH 12	N/A	N/A

**complete as needed*

Sample ID	Particle Size Reduction (Y/N)	Bottle	Preliminary Determination pH	Fluid Used	Fluid Volume (mL)	Comments
MB-579	N	B27	N/A	TCLP 1	2000	
2401003-015A	N	B26	2.101	TCLP 1	2000	
2401003-016A	N	B21	3.559	TCLP 1	2000	
2401003-017A	N	B8	2.861	TCLP 1	2000	
2401003-018A	N	B31	3.876	TCLP 1	2000	
2401003-019A	N	B23	3.522	TCLP 1	2000	
2401003-020A	N	B40	3.996	TCLP 1	2000	
2401003-021A	N	B25	2.034	TCLP 1	2000	
2401003-022A	N	B17	2.571	TCLP 1	2000	
2401003-023A	N	B7	2.065	TCLP 1	2000	
2401003-024A	N	B11	2.671	TCLP 1	2000	
2401003-025A	N	B38	1.995	TCLP 1	2000	
2401003-026A	N	B20	1.997	TCLP 1	2000	

SRN Testing Services, LLC

PREP BATCH REPORT

Prep Start Date: **1/16/2024 3:20:00 P**
Prep End Date: **1/17/2024 8:05:00 A**

Prep Factor Units: **mL / g**

Prep Batch ID: **579** Prep Code: **PREP_TCLP** Method No: **SW-846 1311** Technician: **Ryan Serafino**

Initial Temp: **22 °C** Final Temp: **23 °C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-579		Solid	4.97	4.98	100	0	0	2000	20.000	1/16/2024	1/17/2024
2401003-015A	RT-FM-C1-Zone 1	Solid		6.111	100.06	0	0	2000	19.988	1/16/2024	1/17/2024
2401003-016A	RT-FM-C1-Zone 2	Solid		6.007	100.17	0	0	2000	19.966	1/16/2024	1/17/2024
2401003-017A	RT-FM-C2-Zone 1	Solid		6.373	100.46	0	0	2000	19.908	1/16/2024	1/17/2024
2401003-018A	RT-FM-C2-Zone 2	Solid		6.093	100.13	0	0	2000	19.974	1/16/2024	1/17/2024
2401003-019A	RT-FM-C3-Zone 1	Solid		6.778	100.4	0	0	2000	19.920	1/16/2024	1/17/2024
2401003-020A	RT-FM-C3-Zone 2	Solid		6.631	100.16	0	0	2000	19.968	1/16/2024	1/17/2024
2401003-021A	RT-MP-C1-Zone 1	Solid		5.604	100.2	0	0	2000	19.960	1/16/2024	1/17/2024
2401003-022A	RT-MP-C1-Zone 2	Solid		5.35	100.34	0	0	2000	19.932	1/16/2024	1/17/2024
2401003-023A	RT-MP-C2-Zone 1	Solid		5.58	100.28	0	0	2000	19.944	1/16/2024	1/17/2024
2401003-024A	RT-MP-C2-Zone 2	Solid		5.565	100.19	0	0	2000	19.962	1/16/2024	1/17/2024
2401003-025A	RT-MP-C3-Zone 1	Solid		6.641	100.49	0	0	2000	19.902	1/16/2024	1/17/2024
2401003-026A	RT-MP-C3-Zone 2	Solid		6.369	100.23	0	0	2000	19.954	1/16/2024	1/17/2024

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

SRN testing

SRN Testing Services, LLC
2258 Southwind Blvd
Bartlett, IL 60103
603-503-5002
www.srntest.com

Chain of Custody

SRN use only
SRN WO: 2401003
Receipt Temperature: 12.6 °C
Thermometer Used: T03
VOC Headspace Checked: ☐ Yes ☒ N/A
Samples: ☒ On Ice ☐ Not On Ice
TAT Request: ☒ Standard ☐ Other: ____

Report to Company: Redox Tech, LLC
Contact: John Haselow
Address: 200 Quade Dr, Cary, NC 27513
Job Name/Project ID: ISS to treat lead on landfill soil, IN
Phone Number: (919)678-0140
E-mail: jhaselow@redox-tech.com
Send Invoice (if different from contact): tapril@redox-tech.com

Standard Turnaround Time (TAT): 10 business days
Rush Request: ☐ Yes ■ No TAT Request (days):
Report Type (663, Waste, etc.): Results only

Highlighted sections are required to be filled out by the client

SRN Project ID: 1027

Indicate State of sample origination (circle): IL WI IN Other:

Client Sample ID	Collection Date	Collection Time	Collected	Matrix Type	No. of Containers	Unpreserved	Preserved	RCRA TCLP Analysis for Metals - Lead	Pmoist for dry weight reporting	pH @25C for soil					Comments
RT-UN-C0-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-UN-C0-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-BX-C1-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-BX-C1-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-BX-C2-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-BX-C2-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-BX-C3-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-BX-C3-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-TB-C1-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-TB-C1-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-TB-C2-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-TB-C2-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-TB-C3-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-TB-C3-Zone 2	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					
RT-FM-C1-Zone 1	12/21/23	1300	JFOM	Solid soil	1	x		x	x	x					

Continued on 2nd COC? Yes No

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	1/8/24	12:00	[signature]	01/08/24	13:20

☑ Dispose at 30 Days ☐ Return ☐ Store (_____ Days)

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Client Sample ID	Collection			Misc.		Preservative		Analyses Requested								Comments
	Date	Time	Collected by:	Matrix Type	No. of Containers	Unpreserved	Preserved	RCRA TCLP Analysis for Metals - Lead	Pmoist for dry weight reporting	pH @25C for soil						
RT-FM-C1-Zone 2	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-FM-C2-Zone 1	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-FM-C2-Zone 2	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-FM-C3-Zone 1	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-FM-C3-Zone 2	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-MP-C1-Zone 1	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-MP-C1-Zone 2	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-MP-C2-Zone 1	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-MP-C2-Zone 2	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-MP-C3-Zone 1	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						
RT-MP-C3-Zone 2	12/21/23	1300	JFOM	Solid soil	1	X		X	X	X						

Relinquished by: [illegible]	Date: 1/8/24	Time: 12:00	Received by: [illegible]	Date: 1/9/24	Time: 13:2[illegible]
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

☑ Dispose at 30 Days ☐ Return ☐ Store (_______ Days)

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