# INTERIM REMEDIAL ACTION PLAN

**for**

# NORTHERN TECH TOWN PROPERTY BOUNDARY

**TECH TOWN**
**711 AND 719 EAST MONUMENT AVENUE**
**DAYTON, MONTGOMERY COUNTY, OHIO**

**Prepared for:**

**CITY OF DAYTON**
**101 West Third Street**
**Dayton, Ohio 45402**

**Prepared by:**


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# FINAL

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| | |
|---|---|
| °F | degrees Fahrenheit |
| < | less than |
| ≤ | less than or equal to |
| > | greater than |
| % | percent |
| / | per |
| µg/L | microgram per liter |
| ARAR | Applicable or Relevant and Appropriate Requirements |
| AOIs | Areas of Interest |
| bgs | below ground surface |
| BUSTR | Bureau of Underground Storage Tank Regulations |
| City | City of Dayton |
| CityWide | CityWide Development Corporation |
| CFR | Code of Federal Regulations |
| CIDARS | Chemical Information Database and Applicable Regulatory Standards |
| cis-1,2-DCE | cis-1,2-dichloroethene |
| $cm^2$ | centimeter squared, square centimeter |
| $cm^2$/day | square centimeter per day |
| $cm^2/m^2$ | square centimeter per square meter |
| cm/s | centimeters per second |
| COC | chemicals of concern |
| COPC | constituent of potential concern |
| CORF | Clean Ohio Revitalization Fund |
| CP | Certified Professional |
| CRA | Conestoga Rovers and Associates, Inc. |
| CTA | Creative Technology Accelerator |
| DCE | Dichloroethene |
| EU | Exposure Unit |
| EPC | exposure point concentration |
| ft | feet or foot |
| Fountains | The Five Rivers Fountain of Lights at Riverscape MetroPark |
| gpm | gallons per minute |
| GDCSS | Generic Direct Contact Soil Standards |
| GM | General Motors |
| GUPUS | Generic Unrestricted Potable Use Standards |

| | |
|---|---|
| HI | hazard index |
| HQ | hazard quotient |
| HRC | hydrogen release compound |
| | |
| IAs | Identified Areas |
| IMZM | Inside the Mixing Zone Maximum |
| IRAP | Interim Remedial Action Plan |
| | |
| kg | kilogram |
| | |
| L | liter |
| L/day | liter per day |
| $L/cm^3$ | liter per cubic centimeter |
| $L/m^3$ | liter per cubic meter |
| L/min | liter per minute |
| LBSVs | Leach-based soil values |
| | |
| m | meter |
| $m^2$ | meter squared, square meter |
| $m^3$ | meter cubed, cubic meter |
| m/s | meter per second |
| MCD | Miami Conservancy District |
| MCL | Maximum Contaminant Level |
| mg | milligrams |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| $mg/m^3$ | milligrams per cubic meter |
| mg/min | milligrams per minute |
| mL/hr | milliliters per hour |
| MOA | Memorandum of Agreement |
| | |
| NAPL | non-aqueous phase liquid |
| NFA | No Further Action |
| | |
| O&M | Operation and Maintenance |
| OAC | Ohio Administrative Code |
| Ohio EPA | Ohio Environmental Protection Agency |
| OMZA | Outside the Mixing Zone Average |
| OMZM | Outside the Mixing Zone Maximum |

| | |
|---|---|
| PBCA | Performance Based Corrective Action |
| PCBs | Polychlorinated biphenyls |
| PCE | Tetrachloroethylene |
| POGWMUPUS | protection of groundwater meeting unrestricted potable use standard |
| Property | Tech Town (also known as East Phase) |
| PSRA | Property Specific Risk Assessment |
| QA/QC | Quality Assurance/Quality Control |
| RAO | Remedial action objectives |
| RAP | Remedial Action Plan |
| RCRA | Resource Conservation and Recovery Act |
| RFI | RCRA Facility Investigation |
| RSL | regional screening level |
| s/hr | seconds per hour |
| SRW | SRW Environmental Services, Inc. |
| SVE | soil vapor extraction |
| TSCA | Toxic Substance Control Act |
| TCE | Trichloroethene |
| UCL | upper confidence limit |
| USD | Urban Setting Designation |
| U.S. EPA | United States Environmental Protection Agency |
| UST | underground storage tank |
| VADEQ | Virginia Department of Environmental Qualilty |
| VAP | Voluntary Action Program |
| VISLs | Vapor Intrusion Screening Levels |
| VF | volatilization factor |
| VOCs | Volatile organic compounds |
| VURUM | Virginia Unified Risk Assessment Model |
| WESTON | Weston Solutions, Inc. |

# 1. INTRODUCTION

Weston Solutions, Inc. (WESTON®) prepared this Interim Remedial Action Plan (IRAP) under authorization of the City of Dayton (City) for the northern portion of the Tech Town property. The Tech Town property (the Property, also commonly referred to as the East Phase of the Tech Town redevelopment) was formerly the central portion of the General Motors (GM) Delphi Harrison Thermal Systems Plant (**Figure 1.1**).

In 2006, the City received a Clean Ohio Revitalization Fund (CORF) grant for the Property. In accordance with stipulations of the CORF grant, the City is working to remediate the Property to comply with Ohio Voluntary Action Program (VAP) standards for commercial and industrial reuse. A legal description of the Property is provided in **Appendix A**.

A levee extends along the northern Property boundary, between the Property and the Mad River. The Miami Conservancy District (MCD) is planning to upgrade the levee during 2020. The proposed levee modifications include reducing the slope of the levee to create a more gradual incline from the river side to the top of the levee. To accommodate the change in slope, MCD has requested an easement from the current Property owner (Tech Town Holdings, a subsidiary of CityWide Development Corporation [CityWide]) to extend the top of the levee onto the northern portion of the Property. After modifications, a bikeway is planned for construction that will extend from Webster Street across the crest of the levee and down the levee bank to the lower bike path along the river.

The levee improvement project will improve the integrity of the levee in multiple ways. The new levee will be constructed with soil that has a much higher clay content than the existing levee. This will decrease the permeability of the levee, resulting in an increase in stability during high water events. The new levee will have flatter slopes which will help with maintenance and reduce the risk of erosion. Material will also be added on the landside toe of the levee for additional stability.

The top of the existing levee is approximately ten feet (ft) higher in elevation than the surface elevation of the former GM plant. A berm currently exists on the northern Property boundary creating a gradual slope from the Property to the top of the existing levee. A modified berm, similar to the existing construction, would remain on the landside of the levee to create a gradual slope to the top of the levee from the Property. The toe of the modified berm would shift to the south by approximately 60 ft. Additional details on the proposed modifications are provided in **Appendix B**.

The existing berm was constructed following plant demolition activities to address a safety concern associated with the drastic drop in elevation from the levee, which had been previously fenced and supported by concrete or brick walls. The berm was primarily constructed with excess soil removed during construction of the Tech Town infrastructure projects. Analytical data representing soil used to construct the berm is provided in **Table 1.1**. The soil in the existing berm will primarily remain in place, with the exception of limited soil displacement/relocation to allow for the addition of higher clay-content soil as needed for the levee. Additional fill material will be placed over the existing berm as part of the levee modification work. The fill material will include off-Property soil from the water-side of the levee moved onto the Property (from areas where the levee bank will be modified to reduce the slope), along with clean imported fill from other off-Property sources. All imported fill material will be evaluated to ensure the material meets applicable standards.

The purpose of this IRAP is to obtain Ohio Environmental Protection Agency (Ohio EPA) approval to consider the clean imported fill used for the levee modifications/modified berm as protective soil cover in the northern portion of the Property. A Remedial Action Plan (RAP) is in progress that will address the entire Property. However, based on the anticipated schedule for levee modifications/modified berm, this IRAP was prepared to expedite Ohio EPA review of the remedy proposed for the northern portion of the Property.

Similar to the Dayton Technology Campus VAP property (the western third of the former GM property, commonly referred to as West Phase), the Tech Town VAP property will also include an Environmental Covenant with activity and use restrictions. The Property will be restricted to commercial or industrial use, with a greenspace and recreational use allowance in legally defined areas along the northern portion of the Property. Residential, K-12 school, pre-school, and daycare use will be prohibited on the Property.

This IRAP will identify remedial measures to be implemented to achieve Ohio VAP standards along the northern Property boundary. This IRAP presents a summary of the investigations that have been conducted in the northern portion of the Property, identification of response requirements, a description of proposed remedial measures, and an implementation schedule.

## 1.1 SITE DESCRIPTION

The Property is bound by Taylor Street to the west, the Mad River levee to the north, the western edge of the former Building 10 and Meigs Street to the east, and Monument Avenue and Pitt Street to the south. The northern portion of the Property addressed by this IRAP is identified in **Figure 1.2**, along with historic Areas of Interest (AOIs) and Identified Areas (IAs). Ohio Administrative Code (OAC) 3745-300-01 defines an IA as a location on a property where a release of hazardous substances or petroleum has or may have occurred. The IAs associated with the northern Property boundary are discussed further in **Section 2**.

## 1.2 SITE USE AND OWNERSHIP

Tech Town Holdings, a subsidiary of CityWide, owns the northern portion of the Property where the proposed protective soil cover would be located. The northern portion of the Property is currently vacant.

GM purchased the former facility property in 1919 and various divisions of GM and Delphi Corporation operated the facility until it closed in 1995. GM manufactured automotive air conditioning compressors and associated parts, electric refrigerators, household appliances, and machine guns (during World War II) on the Property. GM operations included metal machining, grinding, and heat treatment; electroplating, coating, and painting; assembly and packaging; and product and materials testing. GM was a large-quantity generator of hazardous waste and had operated under an Interim Part A Resource Conservation and Recovery Act (RCRA) permit with status as a treatment, storage, and disposal facility. In 2001, GM entered into a RCRA Performance Based Corrective Action (PBCA) Agreement with the United States Environmental Protection Agency (U.S. EPA) to independently and voluntarily investigate, and as necessary, stabilize and remediate releases of hazardous wastes or hazardous constituents at the Facility. GM conducted RCRA Facility Investigation (RFI) activities and interim remedial measures. Motors Liquidation Company (formerly known as GM) withdrew from the RCRA PBCA Agreement in 2009.

The City received a CORF grant for the Property in 2006. As a condition of the grant, the City has undertaken a voluntary action on the Property to achieve applicable standards protective of human health and the environment in accordance with the Ohio VAP.

All former GM buildings on the Property were demolished by the City in 2009. The Creative Technology Accelerator (CTA) building was constructed from 2008 to 2009. The Tech Town redevelopment extends beyond the Property to the east and to the west. The property to the west is the Dayton Technology Campus (also known as West Phase) which is addressed in a separate Phase II Property Assessment Report (WESTON, 2013a). Various commercial enterprises and buildings are located across Monument Avenue to the south of the Property.

## 1.3 REGULATORY FRAMEWORK

### 1.3.1 Ohio Voluntary Action Program

The Property is enrolled in the Ohio VAP through the Memorandum of Agreement (MOA) track. As required by the MOA track process, the IRAP will be made available for public review and comment for a 30-day period. This 30-day public comment period will occur concurrently with review of the IRAP by Ohio EPA.

The objective of this IRAP is to expedite approval by Ohio EPA to consider the fill material placed on the northern portion of the Property for the proposed levee modifications/modified berm part of the remedy to address residual soil contamination in the northern portion of the Property. A complete RAP will be submitted at a later date with the objective of achieving No Further Action (NFA) under the Ohio VAP for the entire Property.

### 1.3.2 Resource Conservation and Recovery Act

GM was a large-quantity generator of hazardous waste and had operated under an Interim Part A RCRA permit with status as a treatment, storage, and disposal facility. The former GM Delphi Harrison Thermal Systems Facility was assigned U.S. EPA RCRA Identification Number OHD017958604. In 2001, GM entered into a RCRA PBCA Agreement with the U.S. EPA to independently and voluntarily investigate, and as necessary, stabilize and remediate releases of hazardous wastes or hazardous constituents at the facility. GM conducted RFI activities and interim remedial measures. As a result of the GM bankruptcy, GM withdrew from the RCRA

PBCA Agreement in 2009. In response to the City's request, U.S. EPA delegated RCRA remedial oversight authority for the Property to the State of Ohio, with the stipulation that the Ohio VAP MOA process be followed.

### 1.3.3 Toxic Substances Control Act

The U.S. EPA retains primacy for regulation of obligations under the Toxic Substances Control Act (TSCA). Polychlorinated biphenyls (PCBs) were detected in environmental media on the Property at concentrations exceeding 50 milligrams per kilogram (mg/kg).

Four approvals have been granted to the City and CityWide by U.S. EPA for the Property pursuant to the TSCA regulations. They include:

- Approval to City under 40 Code of Federal Regulations (CFR) 761.61(c) for characterization of process piping residual liquid and approval to crush and reuse concrete (2005).
- Approval to City under 40 CFR 761.61(a) for removal of wood block flooring from the sixth floor of Building 2 and concrete in penthouse electric vault #33 (2009).
- Approval to City under 40 CFR 761.61(c) for remediation of AOIs 36, 44, 47, 48 (2010). This approval also included approval for soil management during redevelopment, specifically allowing media containing PCBs at concentrations less than 25 mg/kg to be retained onsite as feasible and media containing PCBs at concentrations exceeding 25 mg/kg to be disposed in accordance with 40 CFR 761.61(a)(5)(i)(v)(2). An Amendment to this Work Plan was submitted in 2013 requesting approval to cap contamination within AOI 36 (west of the Property).
- Approval to CityWide under 40 CFR 761.61(c) of the Work Plan for Site-Wide Risk-Based Management of PCB-Contaminated Material (2017). This approval included a site-specific standard of 226 mg/kg protective of short-term exposure and required excavation of soil exceeding this standard within the 2 to 10 ft below ground surface (bgs) point of compliance. Deviations from this requirement require prior written authorization from the agency.

On 26 November 2013, U.S. EPA provided a letter to Ohio EPA indicating that sites contaminated with PCBs subject to assessment or cleanup per 40 CFR 761 are eligible to participate in the VAP-MOA, but do not qualify for the federal comfort benefits of the MOA until the requirements of 40 CFR 761 have been fulfilled.

### 1.3.4 Bureau of Underground Storage Tank Regulations

GM's decommissioning and RFI activities included removing a majority of the underground storage tanks (USTs) from the Property. As part of the "one cleanup approach", U.S. EPA notified GM in November 2003 that it was no longer required to submit tank reports to the State Fire Marshal-Bureau of Underground Storage Tank Regulations (BUSTR). U.S. EPA further indicated that at the conclusion of the RCRA corrective action process, U.S. EPA would seek concurrence from the State Fire Marshal-BUSTR that UST corrective action requirements were met. According to the letter, the State Fire Marshal-BUSTR had agreed to this approach.

Following GM's bankruptcy, WESTON contacted BUSTR on behalf of the City to request assistance achieving NFA on the BUSTR release areas. WESTON was advised to follow the BUSTR Tiered Investigative Process. In June 2011, Ohio House Bill 153 was passed which allowed BUSTR Class C release areas to be investigated and remediated per the Ohio VAP. In May 2012, Class C Determination Request Forms were submitted to BUSTR for release areas on the Property that had not achieved NFA. In June 2012, Ohio Senate Bill 294 was passed which allowed any class of BUSTR release area to undergo corrective action consistent with the Ohio VAP rules provided that the volunteer was not the responsible party and there were other chemicals of concern (COC) on the Property. In September 2012, the State Fire Marshal-BUSTR provided notice that the open release areas were designated Class C. Therefore, BUSTR release areas on the Property that have not achieved NFA will be remediated in accordance with the Ohio VAP requirements and do not present an eligibility issue for the voluntary action.

Three BUSTR release incidents are located in the vicinity of former Building 4, and within the proposed levee modifications/modified berm corridor. Release number 03 involved Tank ID 12 (10,000 gallon non-leaded gasoline) and Tank ID 13 (5,500 gallon regular gasoline/diesel). These tanks were removed in 1992 but closure was not documented in the Current Conditions Report (Conestoga-Rovers & Associates [CRA], June 2001). Release number 08 involved Tank ID 14 (2,000 gallon diesel). This tank was removed in 1989 and the BUSTR NFA was received in 1993. The third release did not have a designated release number or Tank ID but was reported as a 1,000 gallon waste oil and solvent tank installed prior to 1971 and removed in 1978. Other BUSTR release incidents were not identified within the proposed levee modifications/modified berm corridor.

## 1.4 PLAN ORGANIZATION

This document consists of the sections summarized below.

- **Section 1**, Introduction: Provides a description of the Property, Property use and ownership, regulatory framework, and scope of the IRAP.
- **Section 2**, Property Assessment Summary: Presents a summary of the Phase I and Phase II assessments conducted at the Property and incorporates the findings of the Property Specific Risk Assessment (PSRA). This section also describes interim supplemental investigations that have been completed following the PSRA to further characterize conditions at the northern portion of the Property and includes supplemental PSRA evaluations for use in determining the applicability of the interim remedial action.
- **Section 3**, Response Requirements: Describes Ohio VAP remediation requirements pertinent to the northern portion of the Property.
- **Section 4**, Proposed Remedial Action: Presents the proposed interim remedial action for soil, groundwater, and indoor air pathways applicable to the northern portion of the Property.
- **Section 5**, Interim Actions During Remedial Action Implementation: Describes actions to be taken to protect human health and the environment during interim action implementation.
- **Section 6**, Implementation Schedule: Presents a proposed schedule for implementation of the proposed interim remedial actions.
- **Section 7**, References: Lists the references used to prepare this IRAP.

Figures and tables, respectively, are presented following **Section 7**, followed by the IRAP appendices.

# 2. PROPERTY ASSESSMENT SUMMARY

## 2.1 PHASE I PROPERTY ASSESSMENT SUMMARY

WESTON prepared an Ohio VAP-compliant Phase I Property Assessment Report for the Property in May 2005 for the City of Dayton (WESTON, 2005). An amendment to the Phase I Report was issued in January 2014 (WESTON, 2014). The purpose of the Phase I Property Assessment was to identify the potential for environmental impacts associated with historical and current Property uses or from activities on properties adjacent to and surrounding the Property. The Phase I Report concluded that potential releases of hazardous substances or petroleum have or may have occurred on the Property.

The 2005 Phase I Property Assessment Report divided the Property into three IAs and described the 19 AOIs on the Property that were identified by GM in the RFI Report (CRA, 2006a). The 2014 Phase I Amendment refined the IAs. **Table 2.1** presents the refined list, including a description of AOIs, corresponding IAs, as applicable, and COCs. **Figure 1.2** presents the locations of the IAs within the Property. As depicted on **Figure 1.2**, the proposed soil cover would extend across portions of 5 IAs (IA3W/6N/16, IA 3E/5W/21/33, IA 5C, IA 5E, and IA 11).

## 2.2 PHASE II PROPERTY ASSESSMENT SUMMARY

The Phase II Property Assessment was conducted from January 2002 through May 2015 with samples collected by SRW Environmental Services, Inc. (SRW, off-Property only), CRA, Haley and Aldrich, WESTON, and subcontractors thereof. Samples were collected to assess the AOIs and IAs, to characterize wastes, to monitor groundwater, and for demonstration of compliance. Environmental media sampled included soil, groundwater, soil gas (off-Property), and sediment (off-Property). Other Property media sampled included concrete, building materials, residual wastes, and sewer sediment. Several reports were generated by the companies listed above to document Phase II activities conducted on the Property and surrounding area (Refer to **Section 7** for references). The Phase II Property Assessment Report (WESTON, 2020a) consolidates and summarizes the Phase II Property Assessment activities and results through May 2015.

A PSRA was completed based on the data collected through May 2015 (WESTON, 2020b). Results of the PSRA are included in the Phase II Property Assessment Report and summarized below. Samples pre-dating the RFI were not included in the Phase II Property Assessment and PSRA data evaluation.

### 2.2.1 Exposure Pathway and Receptor Analysis

An exposure pathway and receptor population evaluation were completed in accordance with OAC Rule 3745-300-07(F). For a receptor to be potentially affected by a COC, there must be an exposure point and a route of exposure. WESTON evaluated a comprehensive list of potential exposure pathways and determined the potentially complete pathways. This evaluation is contained in the PSRA. Further evaluation with respect to applicable standards is not given to pathways that are not complete.

Based on information presented in the PSRA, reasonably anticipated current and future receptors related to the northern portion of the Property include:

- Construction workers/redevelopment workers responsible for development of the northern portion of the Property and on-going maintenance;
- Visitors and patrons to the future establishments on the Property, or accessing the northern portion of the Property via the levee (i.e., recreational users of the levee bikeway);
- Workers and occupants of adjacent properties having the potential to be exposed to COCs from the northern portion of the Property that may be released through dust or vapor emissions during soil disturbance activities or through the non-potable use of groundwater or through migration of vapors from groundwater into indoor air;
- Recreational users of the adjacent Mad River that have the potential to contact COCs that may be emanating from the northern portion of the Property via the groundwater. While the adjacent river supports sport fish, long-term, frequent direct contact with surface water and sediments is not reasonably anticipated.

The analysis of receptor populations and exposure pathways indicate potentially complete exposure pathways for the following:

- Direct contact with soil for commercial/industrial land use receptors (including recreational receptors) and construction workers;
- Direct contact with surface water of the Mad River by recreational users via fish consumption or incidental contact with surface water;
- Inhalation of soil vapor by subsurface construction workers in the areas of elevated groundwater concentrations.

- Inhalation of soil vapor through vapor intrusion from soil and/or groundwater to indoor air of adjacent buildings.
- Non-potable use of groundwater;
- Leaching of COCs from soil to groundwater;
- Discharge of groundwater to surface water;
- Important ecological resources associated with the Mad River.

This list of exposure pathways is based upon the assumption that the Property will be restricted to commercial or industrial use and potable use of the groundwater beneath the Property will be prohibited through institutional controls. Recreational receptors are possible because the Property, although commercial, features a greenspace and a multi-purpose trail along the levee. The allowable land use as commercial land use will not allow use with a high degree of exposure to children, such as a day care or school. Potential exposures along the bike trail by an adult or child recreational receptor are expected to be transient, low frequency and non-intrusive, which is consistent with the definition of commercial land use. While the adjacent Mad River supports sport fish and transient recreational use (e.g. kayaking, canoeing), long-term, frequent direct contact with surface water and sediments is not reasonably anticipated.

### 2.2.2 Determination of Applicable Standards

Applicable standards were established for each medium contributing to or affected by a potentially complete exposure pathway for the Property.

- Direct contact standards have been developed by Ohio EPA for exposure scenarios consistent with the current and future land use of the Property. Generic Direct Contact Soil Standards (GDCSS) are available in OAC Rule 3745-300-08 for commercial/industrial land use and protection of construction workers; supplemental criteria are available in the Chemical Information Database and Applicable Regulatory Standards (CIDARS). The Ohio EPA VAP applies the generic petroleum standards developed by the State Fire Marshal, BUSTR, as presented in the Technical Guidance Compendium document "Applying Generic Petroleum Standards under the Voluntary Action Program" (VA30008.13.001). Commercial land use standards are considered protective of low frequency exposures of children per OAC 3745-300-01(C)(12), as cited in the Technical Guidance Compendium document "Applicability of Commercial/Industrial Generic Numerical Standards to Child Receptors" (VA30008.19.005). K-12 schools, pre-schools, or child day care facilities would not be permitted on the Property, so high frequency exposure to children would not occur on the Property, including on the northern portion to be used as a bike path. Although there are not currently any buildings in this area, generic commercial/industrial indoor air standards developed by Ohio EPA would apply to future buildings.

- Leach-based soil values (LBSVs) represent the concentrations of hazardous substances or petroleum that may be present in the soils while still ensuring protection of potable groundwater use. As detailed in the PSRA, site-specific migration adjusted LBSVs were derived using groundwater modeling and leaching calculations. The model presented a worst-case evaluation and did not account for the following:

- Shallow groundwater discharges to surface water, providing a hydraulic boundary for shallow groundwater migration.

- A majority of the Property is covered by former building slabs that reduce infiltration resulting in a lower leaching potential for residual soil contamination.

- Additional groundwater data evaluation is included in **Section 3** detailing the Conceptual Site Model for off-Property groundwater migration. Based on the more representative assumptions for soil leaching and groundwater migration, it is not reasonably anticipated that residual soil concentrations would leach to shallow groundwater and cause an exceedance of the Generic Unrestricted Potable Use Standard (GUPUS) beyond ½ mile from the Property.

- Although five locations on the Property (monitoring well MW26-04, and soil borings SB73-03, SB74-03, SB145-04, and SB154-04) were identified in the PSRA as exceeding a Site-specific derived LBSV for tetrachloroethylene (PCE) or trichloroethylene (TCE) protective of groundwater at the ½ mile point of compliance, the additional evaluation conducted from 2015 through 2020 has resulted in an improved understanding of this migration pathway. Based on further review of the depth and limited lateral extent of impact at these five locations, and limited magnitude of the residual concentrations (compared to concentrations indicative of free phase product), the potential for resulting groundwater impact was determined to be limited to shallow groundwater at or near the water table surface. The shallow groundwater will likely discharge to surface water before reaching a distance of ½ mile from the Property. The point of compliance is therefore at the river. Surface water sampling conducted in 2019 (discussed in **Subsection 2.3.2**) confirmed that despite evidence of groundwater discharge to surface water, surface water standards were not exceeded.

- Based on the Urban Setting Designation (USD), groundwater migrating from the northern Tech Town property boundary in the deeper portion of the upper aquifer (potentially not discharging to surface water) is not reasonably anticipated to result in GUPUS being exceeded at the USD boundary. Groundwater migration in the lower aquifer was previously modeled to meet GUPUS within ½ mile from the Property. This is further discussed in **Section 3**.

- Ohio River drainage basin water quality criteria for the protection of human health [OAC Rule 3745-1-34 (fish consumption)] were used to evaluate the human health effects from exposure to surface water from non-drinking water (e.g., via fish consumption and incidental contact with surface water). Statewide water quality criteria for the protection of aquatic life are also available in OAC Rule 3745-1-07. The Mad River is designated as a warm water habitat. The Mad River is also part of the Ohio River drainage basin. Ohio River Aquatic Life Tier I and Tier II Values have been developed by the Ohio EPA Division of Surface Water (August 21, 2008) pursuant to OAC Rules 3745-1 and 3745-2. Water quality criteria provided include inside the mixing zone maximum (IMZM), outside the mixing zone maximum (OMZM), and outside the mixing zone average (OMZA).

- Protection of Groundwater Meeting Unrestricted Potable Use Standard (POGWMUPUS) does not apply since the upper and lower aquifer groundwater contain COCs at concentrations exceeding GUPUS.

### 2.2.3 Designation of Exposure Unit

OAC Rule 3745-300-01 defines an exposure unit (EU) as a geographic area within which an exposed receptor may reasonably be assumed to move at random and where contact with environmental media is equally likely at all sub-areas. The area of the proposed soil cover included in this IRAP encompasses the northern portion of the Greenspace Area EU and the P Area EU identified in the PSRA.

The PSRA describes the Greenspace Area EU as follows:

> "The Property abuts the levee for the Mad River. The top of the existing levee is eight or more feet (ft) higher in elevation than the Property grade. During GM's operational history the border between the levee and Property was fenced with a drastic drop in grade retained by a concrete or brick wall. During redevelopment, fill was placed at this border forming a gradual slope from the top of the levee down to the elevation of the Property. This slope was covered with grass and is included in the Greenspace Area EU and P Area EU. Conceptual plans include construction of greenspace that will provide terraced relief from the top of the levee down to the elevation of the Property and will be an amenity to the occupants of the campus, providing access to a vantage point to the river and access to the bike path located along the river's edge. "

The portion of the Greenspace EU addressed by this IRAP includes IA 3W/6N/16 and the northern portions of IA 3E/5W/21/33 and IA 5C. These IAs are described in **Table 2.1**.

The PSRA describes the P Area EU as follows:

> "The Master Plan depicts a Building, labeled P, and parking lot in the northeast corner of the Property. The building and parking lot are conceptual in nature, and there are no plans underway to construct either one. The P Area EU presently contains the slab of the former Building 9."

The portion of the P Area EU addressed by this IRAP includes IA 5E and the northern portion of IA 11. These IAs are described in **Table 2.1**.

### 2.2.4 Direct Contact with Soil Pathways

Soil samples were collected from soil borings, trenches, excavations, test pits, etc. to characterize IAs and AOIs on the Property. Soil sample results for the IAs located near the northern Property boundary are summarized on **Figure 2.1** (IA 3E/5W/21/33), **Figure 2.2** (IA 3W/6N/16), **Figure 2.3** (IA 5C), and **Figure 2.4** (IA 5E and 11). The point of compliance for commercial/industrial workers is a minimum of zero to two ft bgs, and the point of compliance for protection of construction workers is a minimum of zero to 10 ft bgs. To accommodate minor grade changes (less than or equal to [≤] 1 ft) that have occurred or may occur, buffer zones have been included in the data evaluation (i.e., zero to three ft bgs for commercial/industrial workers and zero to 12 ft for construction workers). The commercial/industrial worker exposure is also assessed for the three to 12 ft bgs interval to determine if controls are needed to prevent subsurface soil from being placed within the commercial/industrial worker point of compliance during future excavation activities below three ft. As summarized on these figures, select samples exceeded the single chemical GDCSS for PCBs, TCE, cadmium, and lead. The analytical results were tabulated by depth in the Phase II Property Assessment Report to assess the following points of compliance:

- Surface soil (minimum of zero to three ft bgs) for protecting commercial/ industrial users from direct contact to COCs in soil.
- Subsurface soil (three to 12 ft bgs) for protecting commercial/industrial users from direct contact to COCs in subsurface soil that is exposed and brought to the surface.
- Surface and subsurface soil (minimum of zero to 12 ft bgs) for protecting construction/excavation workers from direct contact to COCs in soil.
- Vadose zone for protecting groundwater from potential leaching of COCs in soil.

As a conservative measure, the PSRA included a one ft buffer in the direct contact evaluation, although the point of compliance is zero to two ft bgs for commercial/industrial workers. Additionally, several samples were collected in the two to four ft bgs interval. These samples were considered in calculations for both the zero to three and three to 12 ft bgs intervals. It should also be noted that total chromium results were compared to hexavalent chromium criteria in the PSRA.

Within the proposed levee modifications/modified berm footprint, COCs were detected in surface soil at concentrations exceeding GDCSS for commercial/industrial land use in the following samples:

- MW-26-04 [0 to 2 ft] – TCE – 66 mg/kg;
- MW-23-04 [0 to 2 ft] – Lead – 6,470 mg/kg; and,
- TT-SB250 [0 to 2 ft] – Total PCBs – 42.3 mg/kg.

Within the proposed levee modifications/modified berm footprint, COCs were detected in surface soil at concentrations exceeding GDCSS for construction workers in the following samples:

- SB-148-04 [0 to 2 ft] – Lead – 528 mg/kg; TCE – 17 mg/kg;
- BH-181 [0 to 2 ft] – TCE – 22 mg/kg;
- MW-14B-04 [0 to 2 ft] – TCE – 25 mg/kg;
- MW-23-04 [0 to 2 ft] - Lead – 6,470 mg/kg; TCE - 30 mg/kg;
- MW-24-04 [0 to 2 ft] – TCE – 44 mg/kg; and,
- MW-26-04 [0 to 2 ft] – TCE – 66 mg/kg.

Within the proposed levee modifications/modified berm footprint, COCs were detected in subsurface soil (two to 12 ft bgs interval) at concentrations exceeding GDCSS for commercial/industrial land use in the following samples:

- MW-37-05 [3.5 to 4.5 ft] - Total PCBs (Aroclor 1254) – 110 mg/kg; and,
- SB-14-02 [10 to 12 ft] – Cadmium – 3,340 mg/kg.

Within the proposed levee modifications/modified berm footprint, COCs were detected in subsurface soil at concentrations exceeding GDCSS for construction workers in the following samples:

- MW-23-04 [8 to10 ft] – TCE – 26 mg/kg; and,
- SB-14-02 [4 to 6 ft] – Cadmium – 2,110 mg/kg; TCE – 20 mg/kg.

The residual COCs in soil indicate that remedial measures are required for protection from direct contact within the northern portion of the Property.

### 2.2.5 Direct Contact – Non-Potable Groundwater

Groundwater beneath the Property is classified as a Critical Resource within an USD. An USD eliminates the potable use pathway for areas surrounding the Property. Thus, comparison to GUPUS is performed to determine the COCs that need to be further evaluated for on-Property non-potable uses (e.g., geothermal heating and cooling use), vapors in a trench, and the COCs that need to be evaluated for off-Property direct contact pathways not related to the potable use of groundwater. An institutional control restricting potable groundwater use will be recorded with the deed for the Property rendering this pathway incomplete. On-Property non-potable direct contact use (e.g., geothermal heating and cooling) and inhalation of vapors in a construction trench are evaluated in the PSRA.

COCs for groundwater direct contact exposures in the upper aquifer (i.e., COCs with detections greater than GUPUS and CIDARS supplemental criteria) include 1,1-dichloroethene (DCE), cis-1,2-DCE, chloroform, ethylbenzene, methylene chloride, PCE, trans-1,2-DCE, TCE, vinyl chloride, PCBs (Aroclor 1254), and arsenic. The highest concentrations of volatile organic compounds (VOCs) exceeding GUPUS were measured in monitoring wells MW-23-04 and MW-37-05, both located in the Greenspace EU and within the proposed levee modifications/modified berm footprint. Vinyl chloride was the only COC detected in the lower aquifer above GUPUS (monitoring well MW-39-05, Greenspace EU).

The residual COCs in groundwater indicate that remedial measures are required for protection from direct contact non-potable use within the northern portion of the Property, as described below. Based on the anticipated groundwater use restrictions that will be in place, direct contact exposure (defined as ingestion, inhalation, or dermal absorption) would be limited to construction workers.

- The lower aquifer groundwater in the CTA Area EU (located on the southern Property boundary) is currently used for geothermal heating and cooling. Although this use has been evaluated and meets acceptable risk thresholds, geothermal well use will not be permitted at other locations on the Property. Geothermal well use off-Property is evaluated in **Subsection 2.4.1**.

- While construction worker direct contact through ingestion and dermal absorption is not considered to be complete on the Property, because the depth to water is greater than (>) 12 ft., inhalation of vapors from groundwater volatilizing into a trench is potentially complete exposure pathway. Volatile COCs in the Greenspace EU may present an unacceptable risk to a construction worker in a trench under a long term (250 day) construction scenario. However, most utility repairs would be short-term (typically less than 10 days). Institutional controls could be implemented to limit this exposure. Off-Property exposure of maintenance/excavation workers to off-Property shallow upper aquifer groundwater during excavations into the water table while maintaining utilities or performing other construction-related activities is evaluated in **Section 2.4.2.**

### 2.2.6 Vapor Intrusion

Soil and groundwater samples collected from the Property have been documented to contain VOCs that may pose an unacceptable human health risk in indoor air for future buildings. Soil gas samples have not been collected in the northern portion of the Property, but groundwater samples from upper aquifer wells screened across the water table were available for comparison to the vapor intrusion screening levels (VISLs). The following COCs were detected in groundwater at concentrations exceeding commercial VISLs in upper aquifer water table wells located at the northern Property boundary:

- MW-23-04 – PCE, TCE, vinyl chloride;
- MW-26-04 – TCE; and,
- MW-9-03 – vinyl chloride.

Thus, TCE, PCE, and vinyl chloride in groundwater would pose a potential risk through subsurface vapor intrusion into a future on-site workplace built within the vicinity of the Greenspace Area EU or P Area EU, including on the adjacent property to the west (West Phase). Remedial measures (e.g., environmental covenants) are needed for the Property and the adjacent West Phase property to mitigate the potential for subsurface vapor intrusion from the upper water table aquifer within approximately 100 ft of an occupied building.

### 2.2.7 PSRA Summary

A summary of the PSRA conclusions is depicted on **Figure 2.5**. As depicted, the cumulative risk calculations exceeded one for direct contact exposure for the construction worker scenario in both EUs located within the northern portion of the Property. Although discrete TCE, PCB, and lead concentrations in surface soil exceed GDCSS for commercial/industrial land use, the cumulative risk ratio for surface soil did not exceed one for the commercial/industrial exposure pathway in either EU. Based on May 2015 analytical results, groundwater in the Greenspace EU exceeds VISLs. Remedial or risk mitigation measures are needed for protection from direct contact with soil and from non-potable exposure to groundwater within the northern portion of the Property and for protection of the volatilization to indoor air pathway from groundwater.

## 2.3 INTERIM INVESTIGATION SUMMARY

As described below, additional investigations and groundwater sampling events were completed after May 2015. Although the Phase II and PSRA were not amended with the more recent results, the results will be included in a subsequent Phase II Addendum. The results of interim investigations within the northern portion of the Property are compared herein to applicable standards described in the Phase II and PSRA.

### 2.3.1 August 2018 Soil Investigation

The August 2018 soil investigation was intended to further characterize soil contamination in the vicinity of monitoring well MW-23-04 (within the Greenspace EU). Soil boring locations were advanced in a 40 ft by 50 ft sampling grid. In total, 58 soil samples were collected including quality assurance/quality control (QA/QC) samples. Based on historical results in this area, soil samples were analyzed for VOCs, PCBs, and lead. The soil sampling locations and key analytical results are summarized on **Figure 2.6** and **Figure 2.7**. Although none of the surface soil concentrations exceeded GDCSS, surface soil samples were not collected from all soil boring locations.

COCs were detected in subsurface soil at concentrations exceeding GDCSS for commercial/industrial land use in the following samples:

- TT-SBA2 [6 to 8 ft] – Total PCBs (Aroclor 1254) – 735 mg/kg (Note: this concentration also exceeded the site-specific criteria of 226 mg/kg approved under the TSCA site-wide work plan);
- TT-SBB2 [6 to 8 ft] – Lead – 9670 mg/kg; Total PCBs (Aroclor 1254) – 92.2 mg/kg;
- TT-SBC5 [8 to 10 ft] – PCE –252 mg/kg duplicate sample (146 mg/kg [below criteria] in original sample);
- TT-SBD2 [10 to 12 ft] – Total PCBs (Aroclor 1254) – 56.8 mg/kg;

- TT-SBD3 [4 to 6 ft] – Total PCBs (Aroclor 1254) – 35.9 mg/kg (50.3 mg/kg duplicate sample); and,

- TT-SBD3 [10 to 12 ft] – Total PCBs (Aroclor 1254) – 128 mg/kg.

COCs were detected in subsurface soil at concentrations exceeding GDCSS for construction workers in the following samples:

- TT-SBA2 [6 to 8 ft] – Total PCBs (Aroclor 1254) – 735 mg/kg;
- TT-SBB2 [6 to 8 ft] – Lead – 9670 mg/kg; and,
- TT-SBC5 [8 to 10 ft] – PCE – 252 mg/kg duplicate sample (146 mg/kg below criteria in original sample).

Analytical results of the 2018 soil sampling investigation were consistent with prior investigations in this area and did not identify a significant area of residual soil contamination that would be expected to contribute to further groundwater contamination. The most prevalent COC detected was Aroclor 1254 (PCBs) which has been demonstrated to have limited mobility.

The elevated PCE concentration at sample location SBC5 was collected from beneath a concrete slab, which also reduces the leaching potential of residual impact. Additionally, neither the duplicate sample collected at this location nor the deeper sample collected at this location replicated the GDCSS exceedance.

### 2.3.2 2019 Surface Water Investigation

To document compliance with generic surface water standards cited in OAC Chapter 3745-1 (OAC 3745-1), surface water samples were collected from the Mad River over a period of 30 days beginning in September 2019. The sampling locations were selected based on the west-northwest direction of groundwater flow, proximity to monitoring well locations with historical VOC detections, and input from Ohio EPA. Six sampling locations were identified along the south bank of the Mad River in the vicinity of expected groundwater discharge.

Ambient surface water samples were collected from the Mad River on 12 September 2019, 19 September 2019, 26 September 2019, and 2 October 2019. Surface water samples were collected using a stainless-steel bomb sampler from downstream to upstream locations during each sampling event. Prior to sample collection, temperature and field parameter readings were collected with a

YSI instrument at the streambed at the six proposed sample locations, as well as five locations downstream and five locations upstream of each proposed location. Final sample locations were selected based on the lowest temperature reading recorded (typically interpreted as the location with the highest probability for groundwater venting).

**Figure 2.8** presents the detected analytical results from the surface water sampling activities. Two VOCs were detected at surface water sample location SW-1-10 in each of the sampling rounds; cis-1,2-DCE and TCE. Detected concentrations of the VOCs remained consistent between each sampling event and in duplicate analytical results and were three orders of magnitude below their respective aquatic life OMZM criteria (8,800 micrograms per liter [µg/l] for cis-1,2-DCE and 2,000 µg/l for TCE). The average cis-1,2-DCE and TCE detected concentrations throughout the 30-day sampling period were 4.2 µg/l and 3.2 µg/l, respectively, and were two orders of magnitude below their respective aquatic life OMZA criteria (970 µg/l for cis-1,2-DCE and 220 µg/l for TCE). The concentrations were also below OMZA water quality criteria for protection of human health (70 µg/L [drinking] for cis-1,2-DCE and 5 µg/L [drinking] and 810 µg/L [fish consumption] for TCE). All other VOCs, including PCE, were below analytical detection limits during each surface water sampling event.

Surface water sampling results indicate that VOCs are discharging into the Mad River proximal to monitoring wells MW-63-07 and MW-8-03. However, concentrations detected in surface water samples are below human health and aquatic OMZA and OMZM criteria, indicating the exposure medium does not pose a risk to aquatic life, wildlife, or human health.

## 2.4 SUPPLEMENTAL PROPERTY-SPECIFIC RISK ASSESSMENT

Groundwater on the Property is not used as a potable water supply, and an USD has been established for the purpose of eliminating the potable use pathway for areas surrounding the Property. On-Property non-potable direct contact use (e.g., geothermal heating and cooling) and inhalation of vapors in a construction trench are evaluated in the PSRA. Off-Property non-potable use was not evaluated in the PSRA but is evaluated in this subsection.

The Tech Town redevelopment extends beyond the Property to the east and to the west. The property to the west is the Dayton Technology Campus (also known as West Phase) which is addressed in a separate Phase II Property Assessment Report (WESTON, 2013b). Impacted deep groundwater for this Property and the West Phase will potentially co-mingle before reaching the off-site area west of the entire Tech Town redevelopment. Thus, the potential for risk from off-Property non-potable use of the deep groundwater (i.e., lower aquifer and upper aquifer intermediate/top of till) considers groundwater data from monitoring wells located west of Webster Street. Although shallow upper aquifer groundwater from the Property will likely discharge to surface water, additional off-Property risk evaluation is also included in this subsection to evaluate actual shallow upper aquifer groundwater concentrations west of Webster Street, regardless of the source.

On the West Phase, the ozone sparge system treating the upper aquifer (shallow and top of till) was shut down in September 2019, following four years of operation. In addition to this treatment, GM had previously conducted ozone sparging in a limited area and implemented a hydrogen release compound (HRC) treatment west of Webster Street. For the lower aquifer wells, there has not been any treatment, other than natural attenuation.

Due to the remedial measures and natural attenuation, the supplemental risk assessment utilizes more recent groundwater data than what was used in the PSRA. Monitoring wells west of the West Phase property boundary sampled during January 2015 through March 2020 were used to assess risk from non-potable groundwater contact. Initially, maximum detected concentrations in the wells were compared to GUPUS (**Table 2.2**). Only 1,1-DCE, cis-1,2-DCE, PCE, TCE, and vinyl chloride exceeded GUPUS and are considered in this evaluation of off-Property non-potable groundwater use. **Table 2.3** summarizes the detected results for these constituents of potential concern (COPCs) by aquifer.

### 2.4.1 Groundwater Risk Estimates for Geothermal Heating/Cooling

The potential for exposure to groundwater was assessed in the PSRA for the on-Property geothermal system. Off-Property groundwater may potentially be used for geothermal heating and cooling. Through either an open or closed loop system, the groundwater is extracted, piped through heat exchangers and discharged to the storm sewer or river or circulated back to the aquifer. Off-Property maintenance workers may be exposed to contaminants in groundwater for a short period of time during maintenance or at the point of discharge.

The U.S. EPA (2020) regional screening level (RSL) on-line calculator for residential groundwater exposure scenario was used and adjusted accordingly to evaluate a worker exposed to a geothermal well via incidental ingestion, dermal contact, and inhalation of vapors. Though contact will be minimal, all three exposure routes were considered to assess the full range of potential methods of contact with an open loop system. Default exposure assumptions for a construction/excavation worker, as listed in the Ohio EPA "Support Document for the Development of the Generic Numerical Standards and Risk Assessment Procedures", including an exposure duration of 1 year, an exposure frequency of 120 days per year and a skin surface area exposed of 3,300 square centimeters ($cm^2$) were applied for a geothermal heating/cooling maintenance worker. As a maintenance worker may be exposed fewer days over a longer duration, the exposure parameters for excavation worker are equivalent to 12 days per year for 10 years. The default adult body weight of 80 kilograms (kg) and an estimated exposure time of 1 hour per day was applied for this maintenance worker scenario. An incidental ingestion rate of 0.005 milliliters per hour (mL/hr), was applied, which is conservatively based on 10 percent (%) of the rate of 50 ml/hr that U.S. EPA (1989) recommends for ingestion while swimming. As incidental ingestion of groundwater is considered to be sporadic and difficult to quantify, including this exposure route is anticipated to overestimate risk. One-tenth of the U.S. EPA's default volatilization factor of 0.5 liters per cubic meter (U.S. EPA. 2019) based on all residential uses of water was used to estimate air concentrations. The method for evaluating the inhalation pathway for groundwater exposures is dependent on the reasonably anticipated maintenance activity and property specific characteristics.

The RSL calculator output is provided in **Appendix C**. Risk estimates were calculated for the maximum detected groundwater concentrations in both the upper aquifer and lower aquifer monitoring wells west of Webster Street, based on sampling performed between 2015 and 2020. The cumulative cancer risk is 4.9E-06 and the non-cancer hazard index (HI) was 1.1, which do not exceed Ohio EPA thresholds. Maximum concentrations of TCE and vinyl chloride were the risk drivers; all other COPCs had risk estimates less than (<) 1E-7 or hazard quotient (HQ) < 0.1.

### 2.4.2 Off-site Excavation/Maintenance Worker

Maintenance/excavation workers could be exposed to off-Property shallow upper aquifer groundwater during excavations into the water table while maintaining utilities or performing other construction-related activities. Potential routes of exposure include incidental ingestion, dermal contact, and inhalation of vapor. This exposure pathway was evaluated for the off-Property area west of Webster Street where depth to groundwater at some locations has been less than 10 ft. Although shallow upper aquifer groundwater in the area of the proposed levee modifications/modified berm discharges to surface water, as a conservative measure, groundwater data west of Webster Street was evaluated for this exposure pathway.

Risk estimates were calculated for the maximum detected groundwater concentrations in the upper aquifer water table monitoring wells west of Webster Street based on samples collected between 2015 and 2020. One-half the detection limit was used as the proxy concentration for 1,1-DCE, which was not detected in the water table monitoring wells. The U.S. EPA (2020) RSL on-line calculator for residential groundwater exposure scenario was used and adjusted accordingly to evaluate the maintenance/excavation worker scenario. The chemical-specific groundwater volatilization factor (VF), described below, replaces the Andelman volatilization factor (K=0.5) in the residential groundwater equations to estimate the airborne concentration of a contaminant in a trench.

The Virginia Department of Environmental Quality (VADEQ) Virginia Unified Risk Assessment Model (VURAM) VERSION: 2.2 (VADEQ, 2019) VF model for indirect contact with groundwater less than 15 ft was used to estimate vapor concentrations in a trench. VURAM first applies a simple fate and transport equation of a vadose zone model to estimate volatilization of gases (emission flux of VOCs) from contaminated groundwater into the air of the trench. Then a box model is used to estimate dispersion of the contaminants from the air inside the trench into the above-ground atmosphere to estimate the exposure point concentration (EPC) for air in a construction trench (Ctrench).

The VF is calculated as:

$$VF = (Ki \times A \times F \times 10^{-3} \times 10^{4} \times 3600) / (ACH \times V)$$

Where:

Ki = overall mass transfer coefficient of contaminant (centimeters per second [cm/s])
A = area of the trench, default of 2.22 meters squared ($m^2$) (2.44 m length, 0.91 m width)
F = fraction of floor through which contaminant can enter (unitless), default of 1
ACH = air changes per hour, default of 2 per hour
V = volume of trench, default of (5.42 cubic meters [$m^3$], at default trench depth of 2.44 m)

$10^{-3}$ = conversion factor (liter per cubic centimeter [L/cm³])
$10^4$ = conversion factor (square centimeter per square meter [cm²/m²])
3600 = conversion factor (seconds per hour [s/hr])

The chemical-specific overall mass transfer coefficients were calculated using chemical specific properties presented in the U.S. EPA (2019) November 2019 RSL table (**Appendix D**).

The above equations and assumptions were used to model vapor emissions from groundwater in a trench and to calculate risk estimates for excavation/maintenance worker inhalation of vapors released from upper zone groundwater. Default exposure assumptions for a construction/excavation worker, as listed in the Ohio EPA "Support Document for the Development of the Generic Numerical Standards and Risk Assessment Procedures", including an exposure duration of 1 year, an exposure frequency of 120 days/year and a skin surface area exposed of 3,300 $cm^2$ were applied for an excavation/maintenance worker. The default adult body weight of 80 kg and an estimated exposure time of 1 hour per day was applied for this scenario. An incidental ingestion rate of 0.005 mL/hr, was applied, which is conservatively based on 10% of the rate of 50 ml/hr that U.S. EPA (1989) recommends for ingestion while swimming.

The RSL calculator output is provided in **Appendix D**. Risk estimates were calculated for the maximum detected groundwater concentrations in upper aquifer water table monitoring wells west of Webster Street, based on groundwater samples collected between 2015 and 2020. The cumulative cancer risk is 9.7E-06 and the non-cancer HI was 0.19, which do not exceed Ohio EPA thresholds of 1E-05 for cancer risk and 1 for non-cancer HI. Maximum concentrations of TCE and vinyl chloride were the risk drivers; all other COPCs had risk estimates < 1E-7 or HQ < 0.1.

### 2.4.3 Groundwater Risk Estimates for Fountain Wells and Irrigation Well

Off-site groundwater is not used as a potable water supply, but non-potable uses in the vicinity of the Property include decorative fountain wells known as The Five Rivers Fountain of Lights at Riverscape MetroPark (Fountains) and an irrigation well at the nearby ballpark. The Fountains are located about three tenths of a mile northwest from the Property and the ballpark is located about one quarter mile southeast of the Property. Note that this off-Property non-potable groundwater use risk evaluation was performed to demonstrate that Property-related VOCs would not be expected to pose an unacceptable risk from exposure if they would reach these wells. The risk estimates should not be interpreted to mean that Property-related VOCs have actually reached or will reach these wells.

### 2.4.3.1 Fountains Exposure Scenario

The Fountains consist of five water jets that straddle the confluence of the Great Miami and Mad Rivers and discharge groundwater to the center of the river where a central jet of groundwater discharges 200 ft into the air. The Fountains have seven wells that intermittently extract groundwater from the lower aquifer during the day and evening and operate Memorial Day through Labor Day. The Fountains operate for 10-minute intervals and operation is wind speed dependent. If the wind is blowing in a direction and at a velocity that could interfere with area traffic or other activities, individual jets of the Fountains will not operate. Also, during the cold months when water could create hazardous conditions on nearby roads and recreation trails, the Fountains are turned off (https://www.metroparks.org/places-to-go/riverscape/). When the Fountains are operating, visitors could have incidental contact with the groundwater from the Fountains' water jets (CRA, 2006a; CRA, 2006b; CRA, 2008).

Following the method used in the RFI (CRA, 2006a; CRA, 2006b; CRA, 2008), the incidental contact with groundwater from the Fountains' wells was evaluated for a long-term seasonal recreational scenario in which children and adult visitors at off-Property locations are assumed to have exposure via incidental ingestion, dermal contact, and inhalation of vapors. A recreational visitor is assumed to be exposed 43 days per year, which is based on the number of months the average day-time high temperature exceeds 70 degrees Fahrenheit (°F) (5 months per year) and the assumption of two recreational visits during each week in that time period (CRA, 2006a; 2006b; 2008). A dermal exposure time of 10 minutes per one event per day was assumed based on the Fountains operating at a 10-minute interval. Incidental water ingestion rate of 0.005 liter per day (L/day) is conservatively based on 10% of the rate U.S. EPA (1989) recommends for ingestion while swimming (CRA, 2006a; 2006b; 2008). A recreational inhalation exposure time of 1 hour per 8-hour day. The exposed skin surface area of 2,373 square centimeters per day ($cm^2$/day) for a child and 6,032 $cm^2$/day for an adult based on U.S. EPA (2019) defaults for soil contact, based on head, hands, forearms, lower legs, and feet. U.S. EPA (2019) default body weights of 80 kg and 15 kg, respectively were applied for the adult and child recreator.

Because groundwater data are not available from the Fountains' water jets, the exposure assessment conservatively assumed that groundwater from the water jets have VOCs at concentrations equal to concentrations observed at a lower aquifer monitoring well located west of Webster Street (**Table 2.3**). Use of lower aquifer well data is appropriate based on the Fountains well screens reportedly being in the 100 to 200 ft bgs range.

The vapor emissions from the Fountains was estimated from groundwater concentrations as described herein. The methods used in the RFI Report (CRA, 2006a; 2006b; 2008) were used to provide an upper-bound estimate of potential emission of vapors from the Fountains water jets by assuming that 100% of the mass of VOCs in the ejected groundwater volatilized instantaneously, as reflected in the following equation (as presented in the RFI Report [CRA, 2006a; 2006b; 2008]):

$$E_{FW,I} = Q_{FW} \times C_{LA,i}$$

Where:

> $E_{FW,i}$ is the instantaneous emission rate of constituent *i* into the ambient air due to Fountains spraying (mg/min);
>
> $Q_{FW}$ is the total groundwater pumping rate of the Fountains wells (L/min); and
>
> $C_{LA,i}$ is the concentration of constituent *i* in the groundwater sprayed from the Fountains (milligrams per liter [mg/L]).

The total instantaneous pumping rate of the Fountains is 21,000 gallons per minute (gpm) (corresponding to 79,380 L/min), according to information provided to GM (CRA, 2006a; 2006b; 2008).

As presented in the RFI report (CRA, 2006a; 2006b; 2008), the hypothetical emissions were assumed to be mixed by the turbulence of the jets in a of zone 800 ft (244 m) wide, 800 ft (244 m) long, and 100 ft (30 m) high, based on a description of the Fountains layout on the RiverScape MetroPark's web site. A low-end wind speed (Uwind) of 1 m/sec was conservatively used to characterize air moving through this zone during the Fountains operating periods. The Fountains operate at 10-minute intervals at the top of the hour. Time-averaged VOC concentrations in air within the mixing zone during the Fountains operating periods were approximated by adjusting the steady state concentrations that would be predicted for continuous emission according to the duration of emission. Based on this approach, time-averaged VOC concentrations in air within the mixing zone during the Fountains operating periods (Cair in units of $mg/m^3$) were calculated as follows (CRA, 2006a; 2006b; 2008):

$$Cair = \{E_{FW,i} \text{ x } EV \text{ x } ET\} / \{Uwind \text{ x } W \text{ x } H \text{ x } 3600\}$$

Where:

EV is the frequency of the Fountains spraying (1 event/hour);
ET is the duration of the Fountains spraying per event (10 minutes/event);
W is the width of mixing zone for VOC emissions (244 m);
H is the height of mixing zone for VOC emissions (30 m);
3600 is a unit conversion factor (s/hr); and
all other variables are as defined previously.

Setting the groundwater concentration to 1 mg/L, the resulting volatilization factor of 0.03012 $L/m^3$ was obtained (**Appendix E**) and was used to estimate time-averaged air concentrations. This groundwater VF replaces the Andelman volatilization factor (K=0.5) in the residential groundwater equations of the RSL online calculator described below.

The U.S. EPA (2020) RSL on-line calculator for residential groundwater exposure scenario was used and adjusted accordingly to evaluate seasonal recreational receptors to the Fountains groundwater through incidental ingestion, dermal contact, and inhalation of vapors. The resulting estimates are conservative because, for the stated conditions, steady-state concentrations would not be reached within the duration of spraying per event. The assessment of incidental ingestion and dermal contact also yielded upper-bound estimates of exposure, because it conservatively neglected the effects of volatilization on the constituent concentrations in the ejected water. Additionally, as a conservative measure, long-term exposure was assumed (26 years) although actual exposure is likely to be short-term. The RSL calculator output is provided in **Appendix E**.

Although monitoring well MW-61-07 is the closest lower aquifer well to the Fountains (located approximately 280 ft from the nearest Fountains well), PCE, TCE, vinyl chloride, and cis 1,2 DCE have not been detected at this monitoring well for any of the historical sampling events (2007, 2017, 2018). For a more conservative assessment, the most recent results from monitoring well

MW57-07 (located approximately 510 ft upgradient of the nearest Fountains well) were used for the evaluation.

The August 2018 TCE concentration (555 µg/L), vinyl chloride concentration (1.99 µg/L), and cis-1,2-DCE concentration (570 µg/l) for monitoring well MW57-07 provide reasonable worst-case values for evaluating risk. The 1,1-DCE concentration does not exceed its federal maximum contaminant level (MCL) and is not included in this evaluation. PCE was not detected in the lower aquifer monitoring wells; one-half the detection limit was used as the proxy concentration in the calculations. Although the actual concentrations in the Fountains well discharge water is expected to be significantly lower, using these conservative input assumptions, the cumulative risk is 3.6E-06 and the non-cancer HI is 0. 3 for the child and 0.1 for the adult, which do not exceed the Ohio EPA thresholds. This off-Property non-potable groundwater use risk evaluation was performed to demonstrate that current off-Property VOC concentrations do not pose an unacceptable risk, even if they were assumed to reach the Fountains at similar levels. Similarly, future concentrations would not be expected to pose an unacceptable risk from exposure, assuming on-going natural attenuation of VOCs in the off-Property groundwater plumes. The risk estimates should not be interpreted to mean that site-related VOCs have actually reached or will reach the Fountains.

#### *2.4.3.2 Irrigation Exposure Scenario*

Maintenance workers could be exposed to VOCs in groundwater during irrigation activities, which would be expected to occur during the months of April through October (7 months). Exposure of workers to any VOCs in water from an irrigation well is expected to be minimal since irrigation typically occurs at night. The magnitude of exposure by a groundskeeper or maintenance worker would be less frequent and less intense than the reasonable maximum evaluations completed for both the geothermal well and Fountains exposure scenarios. Separate risk estimates were not calculated for the groundskeeper or maintenance worker exposure to VOCs in irrigation water scenario because evaluation of the hypothetical geothermal well exposure scenario and Fountains exposure scenario are expected to be protective of these receptors.

### 2.4.4 Off-Property Vapor Intrusion from Groundwater

As described in **Subsection 2.2.6**, COCs were detected in groundwater at concentrations exceeding commercial VISLs in upper aquifer water table monitoring wells located near the northern

Property boundary (monitoring wells MW-9-03, MW-23-04, and MW-26-04). Shallow upper aquifer groundwater from the northern portion of the Property migrates towards the northwest and will discharge to surface water in relatively close proximity to the Property. Although contaminated groundwater from the Property could migrate beneath the adjacent property to the west (Dayton Technology Campus/West Phase) before discharging to surface water, the adjacent property is also undergoing voluntary action and will include an Environmental Covenant with building occupancy restrictions to address the potential for vapor intrusion concerns. Due to the levee location, buildings will not be constructed north of the Property.

The off-Property vapor intrusion pathway west of Webster Street will continue to be monitored as part of the West Phase voluntary action. An ozone sparge treatment system was operated from September 2015 to September 2019 to reduce groundwater VOC concentrations at the western boundary of the Dayton Technology Campus property (West Phase). Based on the March 2020 post-shut down ozone sparge system performance monitoring results, residential groundwater VISLs for shallow upper aquifer monitoring wells immediately downgradient of the treatment area (west side of Webster Street) have been achieved.

### 2.4.5 Off-Property Non-Potable Use Summary

The off-Property non-potable groundwater use risk evaluation was conducted to demonstrate that site-related VOCs would not be expected to pose an unacceptable risk from exposure if they would reach an off-Property receptor. The risk estimates should not be interpreted to mean that Property-related VOCs have actually reached or will reach an off-Property non-potable well or off-Property receptor. The highest concentrations of TCE and vinyl chloride were measured in lower aquifer monitoring wells MW57-07 and MW18-04, respectively. Future monitoring of these off-Property monitoring wells will be included as part of the West Phase voluntary action.

# 3. RESPONSE REQUIREMENTS

Per OAC Rule 3745-300-11, remedial activities are required when a Phase II Property Assessment conducted in accordance with OAC Rule 3745-300-07 reveals that concentrations of COCs in any environmental media fail to comply with applicable standards. As described in **Section 2**, COCs are present in soil at concentrations that exceed GDCSS for commercial/industrial workers and GDCSS for construction/excavation workers. COCs are present in groundwater at concentrations that exceed GUPUS and groundwater VISLs.

## 3.1 GROUNDWATER

The Property is underlain by deposits of the Mad River buried valley aquifer, a sole source aquifer. Groundwater from the upper and lower aquifers is classified as a critical resource. An USD has been established for the purpose of eliminating the potable use pathway for areas surrounding the Property. An USD does not impact groundwater response requirements on the Property or groundwater response requirements addressing off-Property pathways not related to the potable use of groundwater.

Prior investigations have concluded that the direction of groundwater flow in the upper aquifer at the northern portion of the Property is towards the northwest, with discharge of the shallow upper aquifer to the Mad River. A till unit is present beneath the upper aquifer separating the upper and lower aquifer. The direction of groundwater flow in the lower aquifer is influenced by lower aquifer pumping but is generally towards the northwest in the vicinity of the Property. Potentiometric surface maps for the upper aquifer from the May and November 2019 TSCA monitoring events are included as **Figure 3.1** and **Figure 3.2**.

The point of compliance for the current USD is ½ mile from the Property boundary. An application is in progress to expand the USD to join other USDs located within the City. Because the proposed USD boundary is > ½ mile from the Property, the point of compliance for the expanded USD would become the expanded USD boundary. Regardless of which point of compliance is used, the Conceptual Site Model indicates that shallow groundwater contamination (as observed at monitoring well MW-23) will discharge to surface water prior to reaching the point of compliance in groundwater. Although residual soil contamination was identified in the vicinity of monitoring well MW-23, the concentrations did not exceed saturation limits and groundwater concentrations at monitoring well MW-23 are not indicative of non-aqueous phase liquid (NAPL). Therefore, associated impact to groundwater is expected to be near the water table surface, within the interval expected to discharge to surface water.

As detailed in the Phase II report (WESTON, 2020a), groundwater in the upper aquifer that is upgradient of and migrating onto the Property contains COCs in excess of GUPUS. Further contamination of the groundwater has occurred on the Property and from the adjacent property to the east (also part of the former GM facility). As such, groundwater contamination is considered to be partially attributed to source areas from the Property and the response requirements of OAC Rule 3745-300-10(E)(2) apply, which include:

- The volunteer shall implement institutional controls or engineering controls that reliably prevent human exposure on the Property to groundwater with concentrations of COCs in excess of unrestricted potable use standards or shall restore the ground water underlying the Property to GUPUS. This will be accomplished through an Environmental Covenant for the Property restricting groundwater use.
- The volunteer shall address all non-potable use ground water exposure pathways in accordance with paragraph (F) of rule 3745-300-07. This will be accomplished through an Environmental Covenant for the Property restricting groundwater use and evaluation of off-Property exposure pathways. The off-Property exposure pathways have been evaluated and determined not to exceed applicable risk thresholds as described in **Subsection 2.4**.
- Ensure off-Property exposure to groundwater in excess of GUPUS within the USD (e.g., geothermal wells, irrigation wells) has been evaluated and determined not to exceed applicable risk thresholds. This exposure pathway has been evaluated and determined not to exceed applicable risk thresholds as described in **Subsection 2.4**.
- Remediate source areas of contamination on the Property to prevent leaching of COCs which would be reasonably anticipated to result in GUPUS being exceeded in groundwater beyond the USD boundary. This exposure pathway has been evaluated. Based on the shallow groundwater discharge to surface water, it is not reasonably anticipated that a source area exists at the northern Property boundary that would cause GUPUS to be exceeded beyond the USD boundary. Surface water sampling in the Mad River indicated that concentrations are below human health and aquatic criteria. This evaluation is provided in **Subsection 2.3.2**.
- Restore groundwater to GUPUS or provide a reliable alternate potable water supply to off-Property users of well water for potable purposes beyond the USD. This exposure pathway has been evaluated and it is not reasonably anticipated that groundwater will exceed GUPUS beyond the USD as described in **Subsection 2.2.7**.

- Protect building occupants from inhalation of VOCs resulting from vapor intrusion into buildings. This exposure pathway has been evaluated and will be addressed by the Environmental Covenant that will be in place for the Property and the adjacent property to the west (West Phase).
- As specified in OAC Rule 3745-300-10(E)(5)(a)(i): "If ground water discharges to an off-property surface water body that is in close proximity to the property and there is no complete exposure pathway for potable use off-property, as determined in accordance with paragraph (F)(1) of rule 3745-300-07 of the Administrative Code, the point of compliance is the surface water body. The applicable standards in paragraph (F) of rule 3745-300-08 of the Administrative Code or paragraph (G) of rule 3745-300-09 of the Administrative Code for the receiving surface water body shall be met instead of unrestricted potable use standards." This exposure pathway has been evaluated and determined not to exceed applicable standards.

When contamination from the Property has caused or is reasonably anticipated to cause the concentrations of COCs to exceed GUPUS in groundwater beyond the USD boundary (or a distance of ½ mile from the Property boundary, whichever is further) a list of other requirements related to reconnaissance of well water use, notifications, and preventing unacceptable exposures apply as specified in OAC Rule 3745-300-10(E)(3)(c)(vi) and must be completed prior to issuance of a NFA letter.

In addition, the certified professional (CP) must verify in accordance with OAC Rule 3745-300-10 that the USD remains protective of the potable use pathway for property that is the subject of a NFA letter. The CP must make the verification at the time of and as part of issuance of a NFA letter for the property. Verification is not required when there is reason to believe that the USD remains protective of the potable use pathway because conditions are unchanged since the USD request or most recent verification.

## 3.2 SOIL

For each complete exposure pathway for environmental media in which the Property fails to comply with an applicable standard, a remedial activity must be implemented. Remedial activities may include passive remediation, active remediation, institutional controls, engineering controls, interim measures, and risk mitigation measures.

An institutional control in the form of an activity and/or use limitation must be established to apply applicable standards for a restricted land use, such as commercial/industrial land use. Activity and use limitations are proposed as part of the remedy and will be included in an Environmental Covenant. An Operation and Maintenance (O&M) plan is required when the demonstration of compliance with applicable standards relies on one or more of the following:

- Remedial activities not completed prior to issuance of the NFA letter and in which conditions at the Property are protective of public health and safety and the environment. Said remedial activities must be operating properly and successfully and be reasonably anticipated to achieve applicable standards in a finite timeframe (e.g., five years or less).
- Evaluation, response, and other activities related to critical resource groundwater response requirements that are implemented to maintain compliance with applicable standards.
- Implementation of a risk mitigation plan.
- An O&M plan is anticipated as part of the remedy. Soil cover in the form of the levee will be used to prevent direct contact by recreational and commercial/industrial users with contaminants in the soil and a Risk Mitigation Plan will be used to ensure the barrier is maintained and to mitigate risk to construction workers during intrusive activities.

## 3.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)

The remediation goals presented in this IRAP are based on chemical specific ARARs developed through the PSRA and State of Ohio ARARs identified in the VAP rules. Additionally, the site-specific risk-based criteria of 226 mg/kg for PCBs established in the site-wide work plan also applies to all soil in the 0 to 10 ft bgs point of compliance.

- The levee modifications will result in approximately 10 ft of soil cover over the location of soil boring TT-SBA2. The elevated PCB concentration at this location was at a depth of 6 to 8 ft bgs. Placement of the soil cover will result in the elevated concentration being outside of the point of compliance specified in the TSCA Work Plan. Upon Ohio EPA approval of this IRAP, a formal request will be made to U.S. EPA for written approval to proceed with the levee modifications/modified berm without removing the identified soil contamination.

## 3.4 REMEDIAL ACTION OBJECTIVES (RAO)

RAOs consist of medium-specific goals for protecting human health and the environment. RAOs specify human health, ecological, and environmental COCs, exposure pathways and receptors, and acceptable constituent levels or ranges of levels for each exposure pathway. RAOs for protecting human receptors should express both a contaminant level and an exposure route rather than contaminant levels alone because protectiveness may be achieved by reducing exposure (i.e., by engineered or institutional controls) as well as by reducing contaminant levels. Alternatively, environmental and ecological objectives should be expressed in terms of the medium of interest and target contaminant levels, whenever feasible, since RAOs developed for protection of environmental receptors typically seek to preserve or restore a resource.

In developing RAOs, due consideration was given to the requirements established under the National Contingency Plan. In addition, the Office of Solid Waste and Emergency Response Directive 9355.7-04 (U.S. EPA, 1995), which provides guidance in determining RAOs, was used in developing the RAOs for the Property. A major point in this directive is that RAOs developed during the remedial investigation and remedial action planning process should reflect reasonably anticipated future land use or uses.

Based on the COCs, exposure pathways and receptors, and an acceptable constituent level for each exposure pathway, RAOs were developed for each media within the northern portion of the Property. **Table 3.1** summarizes the exceedances of the applicable standards by media type, location, pathway, area of interest, and EU. The proposed remedial actions and cleanup criteria based upon the PSRA (including supplemental evaluations included in **Subsection 2.4**) are also identified in **Table 3.1**. Both the maximum concentrations of COCs and the representative average concentration of the COC (i.e. 95% upper confidence limit on the mean ([95% UCL]) within the entire Greenspace EU or Area P EU are provided for soil. If the maximum soil concentration exceeded a standard, an area-wide exposure concentration was determined for each EU evaluated in the PSRA in accordance with OAC Rule 3745-300-07(F)(6)(c)(i).

### 3.4.1 Soil

The following RAOs were developed for soil:

- Prevent or mitigate risk of unacceptable direct human contact exposure to soil containing the COCs in excess of applicable standards.
- Reduce the potential for leaching in source areas with COCs at concentrations that have the potential to cause GUPUS to be exceeded at the USD boundary.
- Protect building occupants from inhalation of VOCs resulting from vapor intrusion into buildings.
- Protect construction workers from inhalation of VOCs resulting from vapor migration into trenches.

**Figures 2.1** through **2.7** present the soil sampling locations from which COCs were detected at concentrations exceeding ARARs.

As shown in **Table 3.1**, the discrete concentration of TCE at monitoring well MW-26-02 (66 mg/kg) and the 95% UCL concentration (64 mg/kg) exceed the commercial/industrial GDCSS of 51 mg/kg (based on 2016 values; 2019 GDCSS is 48 mg/kg). However, the cumulative non-cancer risk ratio (1) and the cumulative cancer risk ratio (1) equaled one in the Area P EU (based on one significant figure). In the Greenspace Area EU, the maximum lead concentration (6,470 mg/kg at monitoring well MW-23-04; duplicate result of 60.4 mg/kg) exceeds the GDCSS for commercial/industrial use and the GDCSS for construction activities. The 95% UCL on the mean lead concentration in surface soil (2,146 mg/kg) exceeds the commercial/industrial GDCSS but the arithmetic average lead concentration in surface soil (403 mg/kg) does not exceed the GDCSS. The arithmetic mean concentration is used to evaluate lead because the U.S. EPA models used to develop the GDCSS are based on central tendency values.

Although one 2018 soil sample result (soil boring TT-SBC5, 8 to 10 ft bgs, 252 mg/kg) exceeded the site-specific migration-adjusted LBSV (80 mg/kg) for PCE, derived in the PSRA based on protection of GUPUS at a point of compliance ½ mile from the Property, none of the other samples reported results near this concentration within the Greenspace EU, including the deeper sample (soil boring TT-SBC5, 10 to 12 ft bgs, 4.22 mg/kg). To further evaluate the 2018 soil sampling results, ProUCL software was used to calculate the 95% UCL for the complete data set (samples collected from zero to 12 ft bgs), the surface soil data set (samples collected from zero to four ft bgs), and the subsurface soil data set (samples collected from two to 12 ft bgs). The ProUCL results are included in **Appendix F**, and key results are summarized in **Table 3.1**. The 95% UCL for the sub-surface data set was 28.29 mg/kg for PCE and does not exceed the site-specific migration-adjusted LBSV.

### 3.4.2 Groundwater

The following RAOs were developed for the shallow aquifer:

- Restrict groundwater use from beneath the northern portion of the Property to the following purposes:

  - Investigation and monitoring of the groundwater condition;
  - Remediation;
  - Dewatering of trenches.

- Reduce the potential for leaching in source areas with COCs at concentrations that have the potential to cause GUPUS to be exceeded at the USD boundary.

- Protect building occupants from inhalation of VOCs resulting from vapor intrusion into buildings.

- Protect construction workers from direct contact with extracted groundwater and inhalation of VOCs resulting from vapor migration into trenches.

Figures summarizing historical groundwater results through March 2020 for select chlorinated VOCs on-and off-Property are included in **Appendix G**. These figures are uniformly color-coded for all COCs with blue shading signifying a result at or up to 10 times the federal MCL, green shading signifying a result 10 to 100 times the federal MCL, orange signifying a result 100 to up to 1,000 times the MCL, and red signifying a result more than 1,000 times the MCL. Although the MCL is not directly applicable within the USD, this color coding provides a uniform standard for evaluating the data, including lateral distribution and historical concentration trends.

**Note:** The figures in **Appendix G** rely heavily on color coding for data presentation. For aesthetic purposes, results are reported in mixed units. Most results are in µg/L, but higher concentrations are reported in mg/L. The results reported in mg/kg are in bold, and in all cases would exceed an MCL, so they are also in color (i.e. a result of 3,000 µg/L for vinyl chloride is presented as **3 mg/L** [as indicated by the bold font] and color-coded red). The MCLs are listed in each summary table after each analyte name.

Significant observations from these figures include the following:

- Figures 1 and 2 – Groundwater concentrations in the upper aquifer west of Webster Street are generally decreasing. Some decreases are attributed to operation of the AOI-1 ozone sparge and soil vapor extraction (SVE) systems, and some decreases are likely attributed to naturally occurring mechanisms.

- Figure 3- Groundwater concentrations on the central portion of the West Phase property are significantly lower than concentrations identified near AOI-1 or near monitoring well MW-23. Although the predominant direction of groundwater flow in this area is to the northwest, this contaminant distribution demonstrates that any episodic deviation (during a flood event, etc.) has not resulted in significant migration of the plume in a more westerly direction.

- Figures 4 and 5 – Despite the elevated VOC hotspot at monitoring well MW-23, this area of groundwater impact appears isolated. Low levels of VOCs have been detected at downgradient monitoring wells Day-01 and MW-82-18, suggesting some migration of VOCs towards the river. Evidence of reductive dechlorination is apparent based on the decreasing PCE and TCE concentrations over time, and elevated detections of cis-1,2-DCE and vinyl chloride at monitoring well MW-23.

- Figures 6, 7 and 8 – Groundwater concentrations at monitoring wells screened at the top of the till unit are significantly lower than identified at monitoring well MW-23.

- Figure 9 – With the exception of monitoring well MW-20-04, concentrations in the till rich zone wells are generally decreasing over time.

- Figure 10 – Several lower aquifer wells exist between monitoring wells MW-23 and MW-57-07 that do not exhibit elevated TCE concentrations. Based on the contaminant distribution, the isolated groundwater impact at monitoring well MW-23 is not likely to be contributing to the detections observed at monitoring well MW-57-07.

In addition to groundwater monitoring for VOCs, sampling for PCBs is conducted semi-annually as required under the TSCA Site-wide work plan and this sampling has not identified migration of PCBs beyond Webster Street to the west or at sentinel monitoring wells installed on the north side of the levee.

### 3.4.3 Vapor Inhalation

The following RAOs were developed for vapor inhalation:

- Prevent or mitigate unacceptable vapor inhalation risk resulting from vapor intrusion related to soil or groundwater contamination. Compliance with indoor air standards is the remedial objective.

# 4. PROPOSED REMEDIAL ACTION

The following remedial actions were selected for implementation at the northern Tech Town Property boundary in the footprint of the proposed levee modifications/modified berm:

- Institutional Controls - Institutional controls are non-engineering measures, usually legal or physical means, of limiting potential exposures to a site or medium of concern. Institutional controls prevent human exposure to the identified COCs but do not address reducing the toxicity, mobility, or volume of contamination. Institutional controls would be identified in the Environmental Covenant to be filed with the deed at the completion of the voluntary action.
- Engineering Control – Engineering controls protect against exposure by removing hazardous conditions or by placing a barrier between the hazard and the exposure route. This alternative would require a barrier to be placed between the residual contamination and human exposure, but would not reduce the toxicity, mobility, or volume of contamination. During the installation of an engineering control, potential exposure risk is greatest, and would require additional protection measures for workers.

The subsections that follow include a description and analysis of the proposed remedial actions for the northern portion of the Property.

## 4.1 PROPOSED REMEDIAL ACTIONS FOR SOIL AND GROUNDWATER

The proposed remedial actions for soil and groundwater are as follows:

- Land and Activity Use Restrictions;
- Risk Mitigation Plan; and,
- Engineering Control via protective soil cover

Detailed descriptions for each remedial action are presented in the following subsections.

### 4.1.1 Land and Activity Use Restrictions and Risk Mitigation Plan

This remedial action will consist of institutional controls to address risks to human health and the environment. Specifically, land and activity use restrictions will be implemented for the entire Property to prevent unacceptable human exposure to COCs. A land use restriction will be applied to prohibit residential development or use for the entire Property and to prohibit school or day care development or use. A recreational use allowance will be included for the bike path planned for construction along the crest of the levee at the northern boundary of the Property. This area will require an appropriate legal description once constructed.

An institutional control would be used to restrict occupancy of future buildings on the entire Property, specifically requiring that prior to human occupancy of any future buildings on the Property, a remedy that eliminates vapor intrusion to indoor air exposure shall be installed, operated and maintained as an engineering control, unless otherwise demonstrated to be unnecessary. This would be addressed under an O&M agreement with Ohio EPA or demonstration shall be made to Ohio EPA that applicable standards are met for the vapor intrusion pathway to indoor air without further remedial activity.

Risk mitigation measures are proposed for areas of the Property where soil contains COCs above Construction/Excavation Worker Standards. The required risk mitigation measures will be documented in a Risk Mitigation Plan that describes measures to protect workers from unacceptable exposure per OAC Rule 3745-300-11 (G).

### 4.1.2 Engineering Control via Protective Soil Cover

The levee modifications/modified berm will effectively result in a protective soil cover over the northern boundary of the Property. This soil cover will provide a barrier from exposure to soil contamination, and the existing building slabs that will remain in place will limit groundwater infiltration and associated leaching of residual soil impact from subsurface soil.

In the area of the proposed protective soil cover, constituents in soil above their respective GDCSS include lead, PCBs, and TCE. The proposed levee modifications/modified berm would place up to 10 ft of clean soil on top of the existing soil and concrete located along the northern boundary of the Property. Direct contact with impacted soil will be restricted because locations containing COCs (discussed in **Section 2**) will be covered with at least 2 ft of clean soil based on the levee re-sloping plan. The increased depth to residual soil contamination from the top of the levee modifications/modified berm would also reduce infiltration and reduce leaching potential. Additionally, buildings would not be constructed in this area eliminating the volatilization to indoor air pathway.

The current proposed levee modifications/modified berm include an expansion of the existing levee to the south, creating a more gradual embankment along the Mad River to the north (**Figure 5.1**). This would also require the current southern toe of the embankment to expand onto the northern portion of the Property by approximately 60 ft. The new southern embankment would be placed onto the existing concrete.

During levee modifications/modified berm construction, care must be taken to prevent construction worker exposure to surface and subsurface soil COCs. Excavation of sub-slab soil will not occur during the levee modification work, and existing slabs will be left intact and in place. It is anticipated that existing berm soil will not be removed from the Property during the levee modifications/modified berm construction, but some relocation of the material could occur. Risk mitigation measures will be documented in a Site-specific Health and Safety Plan. That information will also be included in a future Risk Mitigation Plan that will be maintained as part of the O&M Plan for the Property. The Risk Mitigation Plan will be used to protect construction workers from unacceptable exposure to COCs exceeding applicable standards during future soil disturbance activities.

## 4.2 SUMMARY

Implementation of the proposed remedies will allow the northern boundary of the Property to meet the RAOs within a reasonable timeframe. Direct contact of COCs will be mitigated via the levee modifications/modified berm/protective soil cover. Institutional controls will be used to limit use of the Property and to restrict use of groundwater. Risk mitigation measures, as documented in a Risk Mitigation Plan, will be used to protect construction workers from unacceptable exposure to COCs exceeding applicable standards during soil disturbance activities.

# 5. INTERIM ACTIONS DURING REMEDIAL ACTION

The following interim actions will be conducted for the purpose of protecting public health and the environment during remedy implementation.

## 5.1 TASK COORDINATION

Task coordination and management activities will include the functions necessary to ensure proper planning and execution of the levee modifications/modified berm construction activities. Access to the Property will be coordinated with the City and Tech Town Holdings, LLC, the Site owner.

Prior to beginning any earthwork, existing monitoring wells in the proposed construction area will be flagged and discussed with MCD to determine the best approach for preserving required monitoring wells. In some cases, it may be possible to protect the monitoring well for future use. Where this not possible, MCD will need to abandon the monitoring well and replace the monitoring well at the desired location after construction activities are finished.

## 5.2 PERSONAL PROTECTIVE EQUIPMENT AND AIR MONITORING

Personnel involved in levee modification activities in areas with unacceptable construction worker risk will be required to work under a Site-Specific Health and Safety Plan that includes at a minimum: identification of specific Site hazards; risk analysis for the scope of work; personal protection program; monitoring program; emergency contacts; routes and directions to the nearest hospital; plan for handling suspect or hazardous materials; and, a plan for emergency response actions and notifications.

## 5.3 PROPERTY SECURITY

Temporary controls (e.g., fencing, tape) will be used to prevent unauthorized access to the work area(s) during the levee modifications/modified berm project. Temporary controls will be removed following construction.

# 6. IMPLEMENTATION SCHEDULE

The levee modification is tentatively planned to begin in mid-June 2020, pending approval of the IRAP by Ohio EPA. As part of the Ohio EPA review process under the VAP MOA track, a 30-day public comment period is anticipated to begin on approximately 1 May 2020. The public comment period will be advertised, as required. Due to the current Executive Order in place pertaining to social distancing in response to the Coronavirus, local libraries are not currently open to the public. As an alternative, Ohio EPA has authorized use of a public website to post the pertinent documents. The website address will be included in the public notice, along with appropriate contact information for submitting comments to Ohio EPA.

The proposed schedule will allow approximately two weeks to address comments that may be received on the IRAP prior to the anticipated start date for the levee modification project. Comments will need to be addressed prior to Ohio EPA approval of the plan.

A RAP for the remaining portion of the Property will be submitted during 2020. The proposed institutional controls outlined in the IRAP will be implemented concurrently with the preparation of the Environmental Covenant for the Dayton Technology Campus and remaining portions of the Property.

# 7. REFERENCES

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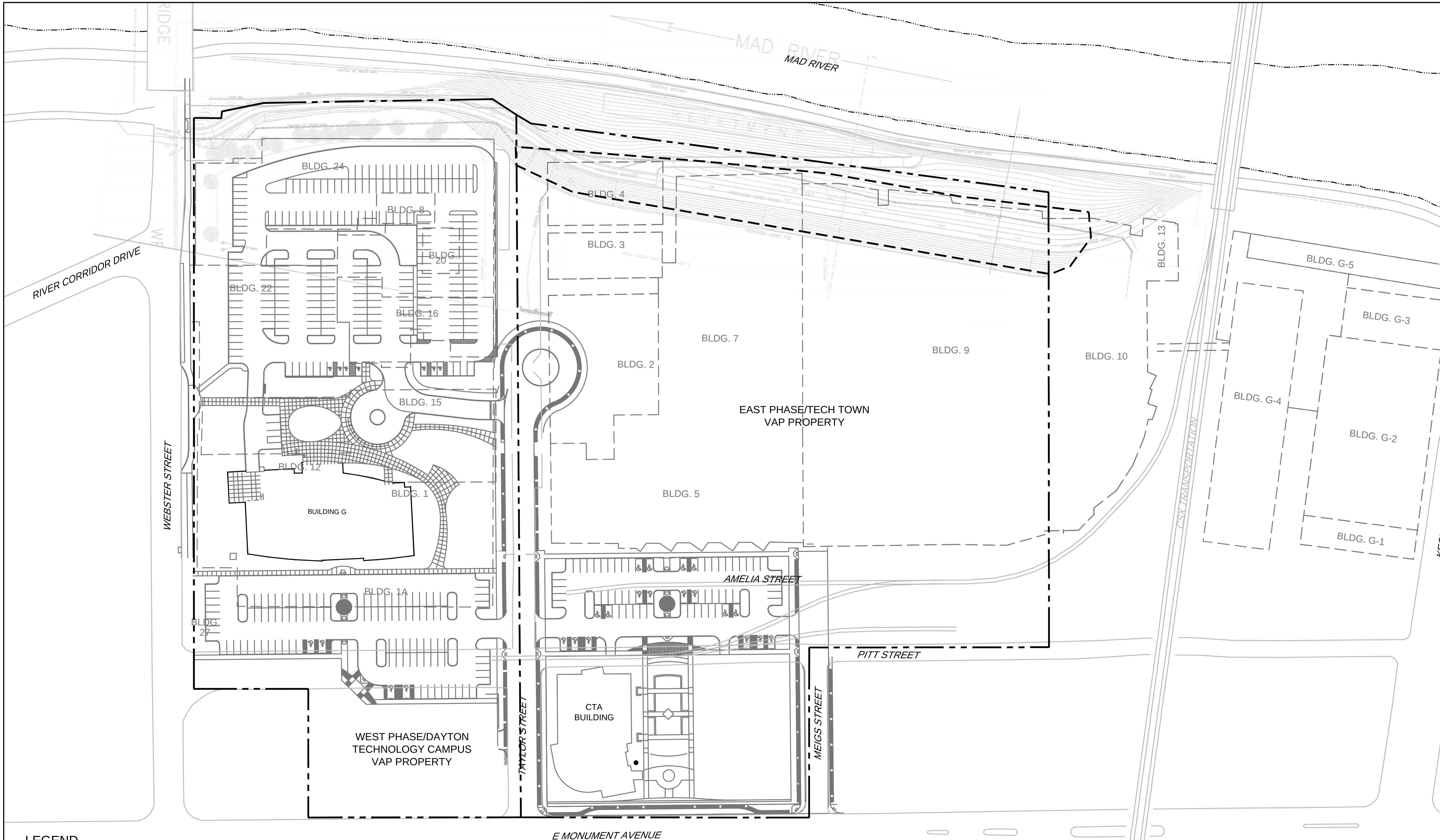
# FIGURES




LEGEND

- MAD RIVER SHORELINE
- FORMER BUILDING FOOTPRINT
- AREA OF PROPOSED SOIL COVER
- VOLUNTARY ACTION PROGRAM (VAP) PROPERTY BOUNDARY

FIGURE 1.1

WESTON SOLUTIONS

714 E. Monument Ave.
Suite 215
Dayton, Ohio
45402

SITE LOCATION MAP
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
Dayton, Ohio

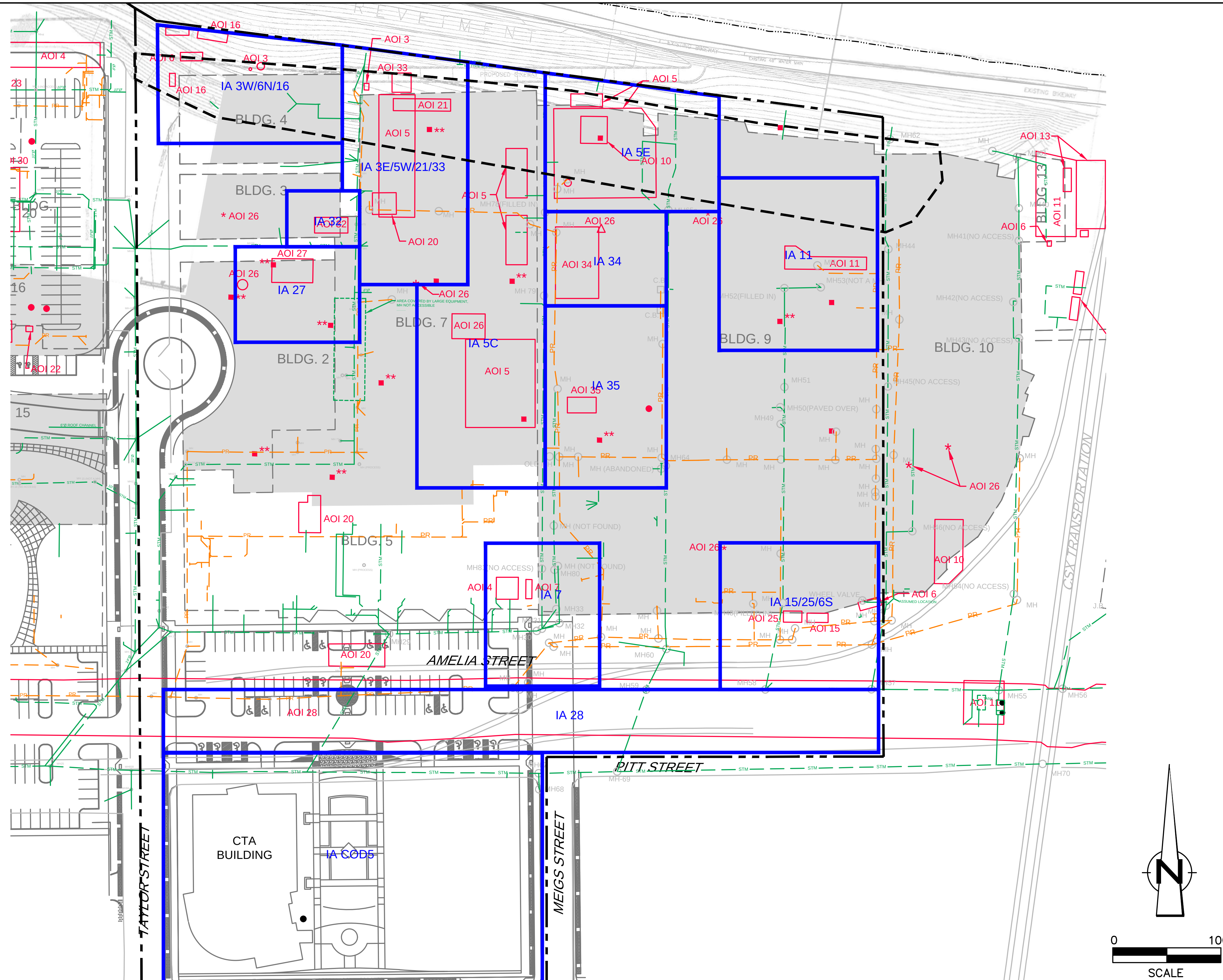
## LEGEND

- FORMER BUILDING FOOTPRINT
- MAD RIVER SHORELINE
- EAST PHASE PROPERTY BOUNDARY
- BUILDING SLAB
- FORMER PROCESS SEWER LINE
- STORM SEWER LINE
- IDENTIFIED AREA (IA)
- AREA OF PROPOSED SOIL COVER

PROPERTY-WIDE IA's:
IA 18/19 (PROCESS AND STORM SEWERS)
IA GW (UPGRADIENT SOURCES)

AREAS OF INTEREST (AOIS):

AOI 3 - WASTE TANKS
AOI 4 - HAZARDOUS WASTE STAGING AREA
AOI 5 - ELECTROPLATING
AOI 6 - SPILL INTERCEPTORS
AOI 7 - SOLVENT STORAGE TANKS
AOI 8 - DEGREASING UNITS:
● STODDARD SOLVENT
■ TCE/PCE/TCA SOLVENT
▲ FREON SOLVENT
** ON UPPER FLOOR
AOI 10 - PAINT WASTE ACCUMULATION AREAS
AOI 11 - CHIP HANDLING AREAS
AOI 15 - HYDRAULIC OIL UST
AOI 16 - FUEL USTs
AOI 18 - STORM SEWERS
AOI 19 - PROCESS SEWERS
AOI 20 - PCB RELEASES FROM ELECTRICAL EQUIPMENT
AOI 21 - HYDROMATION PIT
AOI 25 - HYDROCHLORIC ACID SPILLS
AOI 26 - PCB RELEASES FROM PROCESS EQUIPMENT:
* PROCESS DUCT
○ NO.2 VAILL MACHINE
□ TOOL GRIND ROOM
△ GEAR BOX
AOI 27 - BATTERY CHARGING STATION
AOI 28 - FORMER MIAMI CANAL EXTENSION
AOI 32 - BUILDING 3 TRANSFORMER
AOI 33 - PAINT AND ENAMEL STORAGE
AOI 34 - PARTS GRINDING
AOI 35 - STORAGE TANKS




E MONUMENT AVENUE

WESTON SOLUTIONS

714 E. Monument Ave.
Suite 215
Dayton, Ohio
45402

FIGURE 1.2

IDENTIFIED AREAS AND AREAS OF INTEREST
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
Dayton, Ohio

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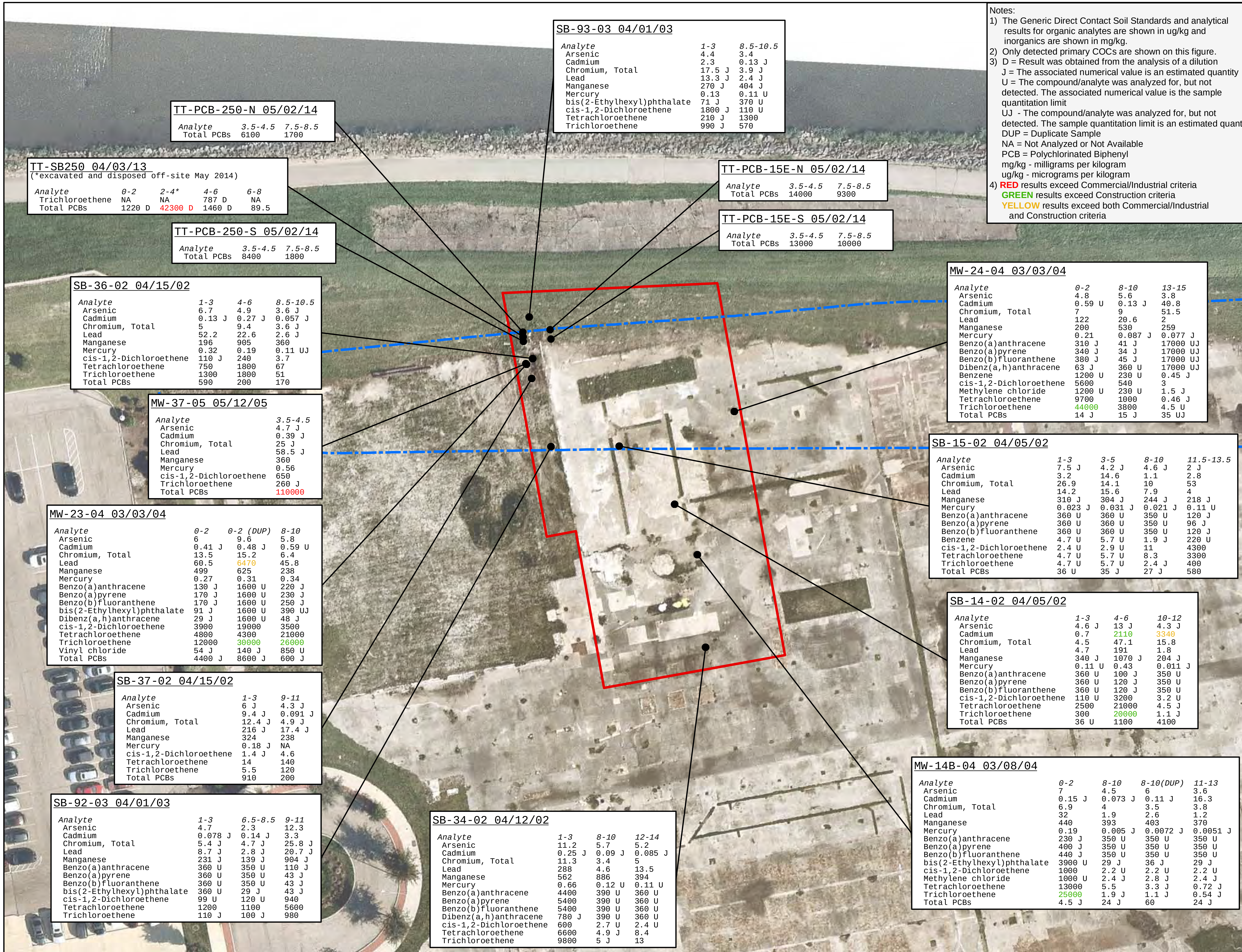


**SB-93-03 04/01/03**

| *Analyte* | *1-3* | *8.5-10.5* |
|---|---|---|
| Arsenic | 4.4 | 3.4 |
| Cadmium | 2.3 | 0.13 J |
| Chromium, Total | 17.5 J | 3.9 J |
| Lead | 13.3 J | 2.4 J |
| Manganese | 270 J | 404 J |
| Mercury | 0.13 | 0.11 U |
| bis(2-Ethylhexyl)phthalate | 71 J | 370 U |
| cis-1,2-Dichloroethene | 1800 J | 110 U |
| Tetrachloroethene | 210 J | 1300 |
| Trichloroethene | 990 J | 570 |

**TT-PCB-250-N 05/02/14**

| *Analyte* | *3.5-4.5* | *7.5-8.5* |
|---|---|---|
| Total PCBs | 6100 | 1700 |

**TT-SB250 04/03/13**
(*excavated and disposed off-site May 2014)

| *Analyte* | *0-2* | *2-4** | *4-6* | *6-8* |
|---|---|---|---|---|
| Trichloroethene | NA | NA | 787 D | NA |
| Total PCBs | 1220 D | 42300 D [red] | 1460 D | 89.5 |

**TT-PCB-15E-N 05/02/14**

| *Analyte* | *3.5-4.5* | *7.5-8.5* |
|---|---|---|
| Total PCBs | 14000 | 9300 |

**TT-PCB-250-S 05/02/14**

| *Analyte* | *3.5-4.5* | *7.5-8.5* |
|---|---|---|
| Total PCBs | 8400 | 1800 |

**TT-PCB-15E-S 05/02/14**

| *Analyte* | *3.5-4.5* | *7.5-8.5* |
|---|---|---|
| Total PCBs | 13000 | 10000 |

**SB-36-02 04/15/02**

| *Analyte* | *1-3* | *4-6* | *8.5-10.5* |
|---|---|---|---|
| Arsenic | 6.7 | 4.9 | 3.6 J |
| Cadmium | 0.13 J | 0.27 J | 0.057 J |
| Chromium, Total | 5 | 9.4 | 3.6 J |
| Lead | 52.2 | 22.6 | 2.6 J |
| Manganese | 196 | 905 | 360 |
| Mercury | 0.32 | 0.19 | 0.11 UJ |
| cis-1,2-Dichloroethene | 110 J | 240 | 3.7 |
| Tetrachloroethene | 750 | 1800 | 67 |
| Trichloroethene | 1300 | 1800 | 51 |
| Total PCBs | 590 | 200 | 170 |

**MW-24-04 03/03/04**

| *Analyte* | *0-2* | *8-10* | *13-15* |
|---|---|---|---|
| Arsenic | 4.8 | 5.6 | 3.8 |
| Cadmium | 0.59 U | 0.13 J | 40.8 |
| Chromium, Total | 7 | 9 | 51.5 |
| Lead | 122 | 20.6 | 2 |
| Manganese | 200 | 530 | 259 |
| Mercury | 0.21 | 0.087 J | 0.077 J |
| Benzo(a)anthracene | 310 J | 41 J | 17000 UJ |
| Benzo(a)pyrene | 340 J | 34 J | 17000 UJ |
| Benzo(b)fluoranthene | 380 J | 45 J | 17000 UJ |
| Dibenz(a,h)anthracene | 63 J | 360 U | 17000 UJ |
| Benzene | 1200 U | 230 U | 0.45 J |
| cis-1,2-Dichloroethene | 5600 | 540 | 3 |
| Methylene chloride | 1200 U | 230 U | 1.5 J |
| Tetrachloroethene | 9700 | 1000 | 0.46 J |
| Trichloroethene | 44000 [green] | 3800 | 4.5 U |
| Total PCBs | 14 J | 15 J | 35 UJ |

**MW-37-05 05/12/05**

| *Analyte* | *3.5-4.5* |
|---|---|
| Arsenic | 4.7 J |
| Cadmium | 0.39 J |
| Chromium, Total | 25 J |
| Lead | 58.5 J |
| Manganese | 360 |
| Mercury | 0.56 |
| cis-1,2-Dichloroethene | 650 |
| Trichloroethene | 260 J |
| Total PCBs | 110000 [red] |

**SB-15-02 04/05/02**

| *Analyte* | *1-3* | *3-5* | *8-10* | *11.5-13.5* |
|---|---|---|---|---|
| Arsenic | 7.5 J | 4.2 J | 4.6 J | 2 J |
| Cadmium | 3.2 | 14.6 | 1.1 | 2.8 |
| Chromium, Total | 26.9 | 14.1 | 10 | 53 |
| Lead | 14.2 | 15.6 | 7.9 | 4 |
| Manganese | 310 J | 304 J | 244 J | 218 J |
| Mercury | 0.023 J | 0.031 J | 0.021 J | 0.11 U |
| Benzo(a)anthracene | 360 U | 360 U | 350 U | 120 J |
| Benzo(a)pyrene | 360 U | 360 U | 350 U | 96 J |
| Benzo(b)fluoranthene | 360 U | 360 U | 350 U | 120 J |
| Benzene | 4.7 U | 5.7 U | 1.9 J | 220 U |
| cis-1,2-Dichloroethene | 2.4 U | 2.9 U | 11 | 4300 |
| Tetrachloroethene | 4.7 U | 5.7 U | 8.3 | 3300 |
| Trichloroethene | 4.7 U | 5.7 U | 2.4 J | 400 |
| Total PCBs | 36 U | 35 J | 27 J | 580 |

**MW-23-04 03/03/04**

| *Analyte* | *0-2* | *0-2 (DUP)* | *8-10* |
|---|---|---|---|
| Arsenic | 6 | 9.6 | 5.8 |
| Cadmium | 0.41 J | 0.48 J | 0.59 U |
| Chromium, Total | 13.5 | 15.2 | 6.4 |
| Lead | 60.5 | 6470 [yellow] | 45.8 |
| Manganese | 499 | 625 | 238 |
| Mercury | 0.27 | 0.31 | 0.34 |
| Benzo(a)anthracene | 130 J | 1600 U | 220 J |
| Benzo(a)pyrene | 170 J | 1600 U | 230 J |
| Benzo(b)fluoranthene | 170 J | 1600 U | 250 J |
| bis(2-Ethylhexyl)phthalate | 91 J | 1600 U | 390 UJ |
| Dibenz(a,h)anthracene | 29 J | 1600 U | 48 J |
| cis-1,2-Dichloroethene | 3900 | 19000 | 3500 |
| Tetrachloroethene | 4800 | 4300 | 21000 |
| Trichloroethene | 12000 | 30000 [green] | 26000 [green] |
| Vinyl chloride | 54 J | 140 J | 850 U |
| Total PCBs | 4400 J | 8600 J | 600 J |

**SB-14-02 04/05/02**

| *Analyte* | *1-3* | *4-6* | *10-12* |
|---|---|---|---|
| Arsenic | 4.6 J | 13 J | 4.3 J |
| Cadmium | 0.7 | 2110 [green] | 3340 [yellow] |
| Chromium, Total | 4.5 | 47.1 | 15.8 |
| Lead | 4.7 | 191 | 1.8 |
| Manganese | 340 J | 1070 J | 204 J |
| Mercury | 0.11 U | 0.43 | 0.011 J |
| Benzo(a)anthracene | 360 U | 100 J | 350 U |
| Benzo(a)pyrene | 360 U | 120 J | 350 U |
| Benzo(b)fluoranthene | 360 U | 120 J | 350 U |
| cis-1,2-Dichloroethene | 110 U | 3200 | 3.2 U |
| Tetrachloroethene | 2500 | 21000 | 4.5 J |
| Trichloroethene | 300 | 20000 [green] | 1.1 J |
| Total PCBs | 36 U | 1100 | 4100 |

**SB-37-02 04/15/02**

| *Analyte* | *1-3* | *9-11* |
|---|---|---|
| Arsenic | 6 J | 4.3 J |
| Cadmium | 9.4 J | 0.091 J |
| Chromium, Total | 12.4 J | 4.9 J |
| Lead | 216 J | 17.4 J |
| Manganese | 324 | 238 |
| Mercury | 0.18 J | NA |
| cis-1,2-Dichloroethene | 1.4 J | 4.6 |
| Tetrachloroethene | 14 | 140 |
| Trichloroethene | 5.5 | 120 |
| Total PCBs | 910 | 200 |

**MW-14B-04 03/08/04**

| *Analyte* | *0-2* | *8-10* | *8-10(DUP)* | *11-13* |
|---|---|---|---|---|
| Arsenic | 7 | 4.5 | 6 | 3.6 |
| Cadmium | 0.15 J | 0.073 J | 0.11 J | 16.3 |
| Chromium, Total | 6.9 | 4 | 3.5 | 3.8 |
| Lead | 32 | 1.9 | 2.6 | 1.2 |
| Manganese | 440 | 393 | 403 | 370 |
| Mercury | 0.19 | 0.005 J | 0.0072 J | 0.0051 J |
| Benzo(a)anthracene | 230 J | 350 U | 350 U | 350 U |
| Benzo(a)pyrene | 400 J | 350 U | 350 U | 350 U |
| Benzo(b)fluoranthene | 440 J | 350 U | 350 U | 350 U |
| bis(2-Ethylhexyl)phthalate | 3900 U | 29 J | 36 J | 29 J |
| cis-1,2-Dichloroethene | 1000 | 2.2 U | 2.2 U | 2.2 U |
| Methylene chloride | 1000 U | 2.4 J | 2.8 J | 2.4 J |
| Tetrachloroethene | 13000 | 5.5 | 3.3 J | 0.72 J |
| Trichloroethene | 25000 [green] | 1.9 J | 1.1 J | 0.54 J |
| Total PCBs | 4.5 J | 24 J | 60 | 24 J |

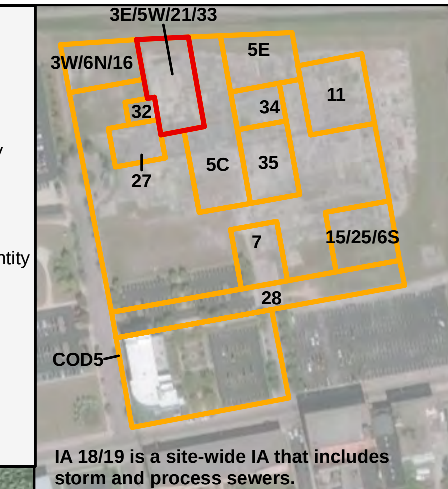
**SB-92-03 04/01/03**

| *Analyte* | *1-3* | *6.5-8.5* | *9-11* |
|---|---|---|---|
| Arsenic | 4.7 | 2.3 | 12.3 |
| Cadmium | 0.078 J | 0.14 J | 3.3 |
| Chromium, Total | 5.4 J | 4.7 J | 25.8 J |
| Lead | 8.7 J | 2.8 J | 20.7 J |
| Manganese | 231 J | 139 J | 904 J |
| Benzo(a)anthracene | 360 U | 350 U | 110 J |
| Benzo(a)pyrene | 360 U | 350 U | 43 J |
| Benzo(b)fluoranthene | 360 U | 350 U | 43 J |
| bis(2-Ethylhexyl)phthalate | 360 U | 29 J | 43 J |
| cis-1,2-Dichloroethene | 99 U | 120 U | 940 |
| Tetrachloroethene | 1200 | 1100 | 5600 |
| Trichloroethene | 110 J | 100 J | 980 |

**SB-34-02 04/12/02**

| *Analyte* | *1-3* | *8-10* | *12-14* |
|---|---|---|---|
| Arsenic | 11.2 | 5.7 | 5.2 |
| Cadmium | 0.25 J | 0.09 J | 0.085 J |
| Chromium, Total | 11.3 | 3.4 | 5 |
| Lead | 288 | 4.6 | 13.5 |
| Manganese | 562 | 886 | 394 |
| Mercury | 0.66 | 0.12 U | 0.11 U |
| Benzo(a)anthracene | 4400 | 390 U | 360 U |
| Benzo(a)pyrene | 5400 | 390 U | 360 U |
| Benzo(b)fluoranthene | 5400 | 390 U | 360 U |
| Dibenz(a,h)anthracene | 780 J | 390 U | 360 U |
| cis-1,2-Dichloroethene | 600 | 2.7 U | 2.4 U |
| Tetrachloroethene | 6600 | 4.9 J | 8.4 |
| Trichloroethene | 9800 | 5 J | 13 |

Notes:
1) The Generic Direct Contact Soil Standards and analytical results for organic analytes are shown in ug/kg and inorganics are shown in mg/kg.
2) Only detected primary COCs are shown on this figure.
3) D = Result was obtained from the analysis of a dilution
J = The associated numerical value is an estimated quantity
U = The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity
DUP = Duplicate Sample
NA = Not Analyzed or Not Available
PCB = Polychlorinated Biphenyl
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
4) **RED** results exceed Commercial/Industrial criteria
**GREEN** results exceed Construction criteria
**YELLOW** results exceed both Commercial/Industrial and Construction criteria




LEGEND

- Soil Sample Locations With Detected Contaminants of Concern
- Soil Sample Locations With No Detected Contaminants of Concern
- Area of Proposed Soil Cover
- Identified Areas



| Analyte | Generic Direct Contact Soil Standards for Single Chemical: Commercial/ Industrial | Construction |
|---|---|---|
| Arsenic | 77 | 690 |
| Cadmium | 2,600 | 1,000 |
| Chromium, Total | NA | NA |
| Lead | 800 | 400 |
| Manganese | NA | NA |
| Mercury | 3.1 | 3.1 |
| Benzo(a)anthracene | 58,000 | 1,200,000 |
| Benzo(a)pyrene | 5,800 | 120,000 |
| Benzo(b)fluoranthene | 58,000 | 1,200,000 |
| bis(2-Ethylhexyl)phthalate | 3,500,000 | 71,000,000 |
| Dibenz(a,h)anthracene | 5,800 | 120,000 |
| 1,1-Dichloroethene | 1,200,000 | 360,000 |
| Benzene | 140,000 | 1,200,000 |
| cis-1,2-Dichloroethene | 2,400,000 | 2,400,000 |
| Methylene chloride | 3,300,000 | 3,300,000 |
| Tetrachloroethene | 170,000 | 170,000 |
| Trichloroethene | 51,000 | 17,000 |
| Vinyl chloride | 50,000 | 280,000 |
| Total PCBs | 20,000 | 440,000 |

0 25 50
Feet
N

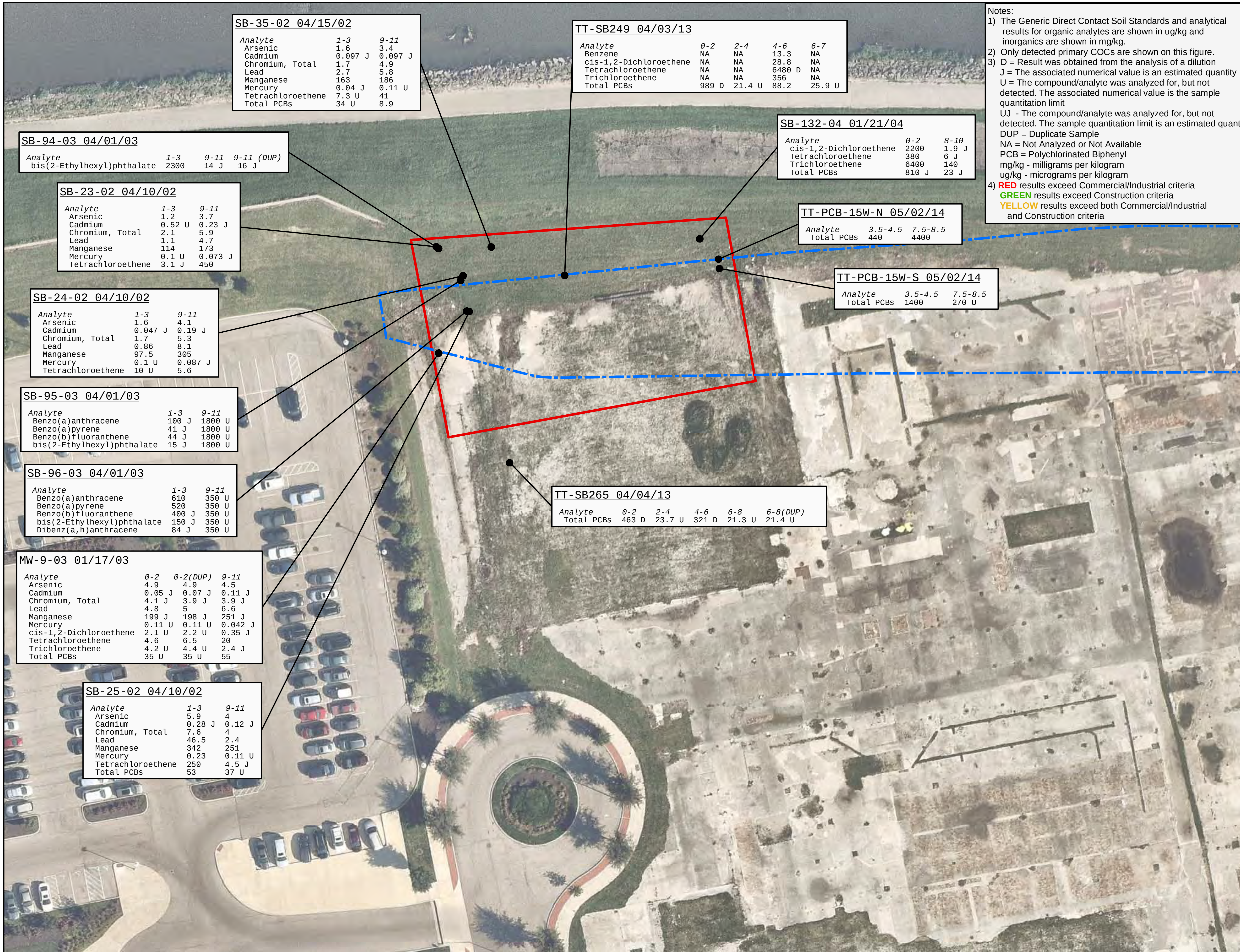
SOURCE: Nearmap 8-24-2018

WESTON SOLUTIONS

FIGURE 2.1
SOIL ANALYTICAL DATA
IDENTIFIED AREA: 3E/5W/21/33
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 2_1 Soil Data IA 3E5W2133_20200429.mxd 9:13:07 AM 4/29/2020 MYERSJT



**SB-35-02 04/15/02**

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 1.6 | 3.4 |
| Cadmium | 0.097 J | 0.097 J |
| Chromium, Total | 1.7 | 4.9 |
| Lead | 2.7 | 5.8 |
| Manganese | 163 | 186 |
| Mercury | 0.04 J | 0.11 U |
| Tetrachloroethene | 7.3 U | 41 |
| Total PCBs | 34 U | 8.9 |

**TT-SB249 04/03/13**

| Analyte | 0-2 | 2-4 | 4-6 | 6-7 |
|---|---|---|---|---|
| Benzene | NA | NA | 13.3 | NA |
| cis-1,2-Dichloroethene | NA | NA | 28.8 | NA |
| Tetrachloroethene | NA | NA | 6480 D | NA |
| Trichloroethene | NA | NA | 356 | NA |
| Total PCBs | 989 D | 21.4 U | 88.2 | 25.9 U |

**SB-94-03 04/01/03**

| Analyte | 1-3 | 9-11 | 9-11 (DUP) |
|---|---|---|---|
| bis(2-Ethylhexyl)phthalate | 2300 | 14 J | 16 J |

**SB-132-04 01/21/04**

| Analyte | 0-2 | 8-10 |
|---|---|---|
| cis-1,2-Dichloroethene | 2200 | 1.9 J |
| Tetrachloroethene | 380 | 6 J |
| Trichloroethene | 6400 | 140 |
| Total PCBs | 810 J | 23 J |

**SB-23-02 04/10/02**

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 1.2 | 3.7 |
| Cadmium | 0.52 U | 0.23 J |
| Chromium, Total | 2.1 | 5.9 |
| Lead | 1.1 | 4.7 |
| Manganese | 114 | 173 |
| Mercury | 0.1 U | 0.073 J |
| Tetrachloroethene | 3.1 J | 450 |

**TT-PCB-15W-N 05/02/14**

| Analyte | 3.5-4.5 | 7.5-8.5 |
|---|---|---|
| Total PCBs | 440 | 4400 |

**TT-PCB-15W-S 05/02/14**

| Analyte | 3.5-4.5 | 7.5-8.5 |
|---|---|---|
| Total PCBs | 1400 | 270 U |

**SB-24-02 04/10/02**

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 1.6 | 4.1 |
| Cadmium | 0.047 J | 0.19 J |
| Chromium, Total | 1.7 | 5.3 |
| Lead | 0.86 | 8.1 |
| Manganese | 97.5 | 305 |
| Mercury | 0.1 U | 0.087 J |
| Tetrachloroethene | 10 U | 5.6 |

**SB-95-03 04/01/03**

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Benzo(a)anthracene | 100 J | 1800 U |
| Benzo(a)pyrene | 41 J | 1800 U |
| Benzo(b)fluoranthene | 44 J | 1800 U |
| bis(2-Ethylhexyl)phthalate | 15 J | 1800 U |

**SB-96-03 04/01/03**

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Benzo(a)anthracene | 610 | 350 U |
| Benzo(a)pyrene | 520 | 350 U |
| Benzo(b)fluoranthene | 400 J | 350 U |
| bis(2-Ethylhexyl)phthalate | 150 J | 350 U |
| Dibenz(a,h)anthracene | 84 J | 350 U |

**TT-SB265 04/04/13**

| Analyte | 0-2 | 2-4 | 4-6 | 6-8 | 6-8(DUP) |
|---|---|---|---|---|---|
| Total PCBs | 463 D | 23.7 U | 321 D | 21.3 U | 21.4 U |

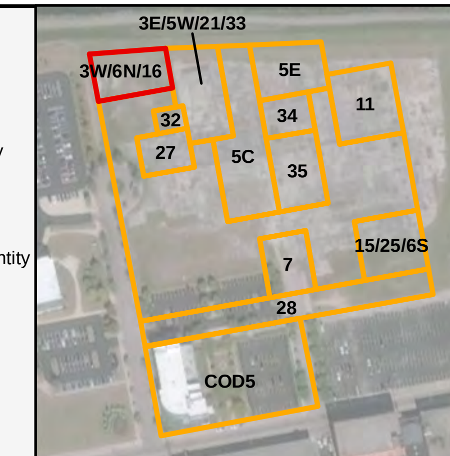
**MW-9-03 01/17/03**

| Analyte | 0-2 | 0-2(DUP) | 9-11 |
|---|---|---|---|
| Arsenic | 4.9 | 4.9 | 4.5 |
| Cadmium | 0.05 J | 0.07 J | 0.11 J |
| Chromium, Total | 4.1 J | 3.9 J | 3.9 J |
| Lead | 4.8 | 5 | 6.6 |
| Manganese | 199 J | 198 J | 251 J |
| Mercury | 0.11 U | 0.11 U | 0.042 J |
| cis-1,2-Dichloroethene | 2.1 U | 2.2 U | 0.35 J |
| Tetrachloroethene | 4.6 | 6.5 | 20 |
| Trichloroethene | 4.2 U | 4.4 U | 2.4 J |
| Total PCBs | 35 U | 35 U | 55 |

**SB-25-02 04/10/02**

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 5.9 | 4 |
| Cadmium | 0.28 J | 0.12 J |
| Chromium, Total | 7.6 | 4 |
| Lead | 46.5 | 2.4 |
| Manganese | 342 | 251 |
| Mercury | 0.23 | 0.11 U |
| Tetrachloroethene | 250 | 4.5 J |
| Total PCBs | 53 | 37 U |

Notes:
1) The Generic Direct Contact Soil Standards and analytical results for organic analytes are shown in ug/kg and inorganics are shown in mg/kg.
2) Only detected primary COCs are shown on this figure.
3) D = Result was obtained from the analysis of a dilution
J = The associated numerical value is an estimated quantity
U = The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity
DUP = Duplicate Sample
NA = Not Analyzed or Not Available
PCB = Polychlorinated Biphenyl
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
4) **RED** results exceed Commercial/Industrial criteria
**GREEN** results exceed Construction criteria
**YELLOW** results exceed both Commercial/Industrial and Construction criteria




**IA 18/19 is a site-wide IA that includes storm and process sewers.**

LEGEND

- Soil Sample Locations With Detected Contaminants of Concern
- Soil Sample Locations With No Detected Contaminants of Concern
- Area of Proposed Soil Cover
- Identified Areas

Station Name — Sample Date

**TT-PCB-650 05/02/14**

| Analyte | 0-3 | 3-12 |
|---|---|---|
| Total PCBs | 6100 | 1700 J |

Depth (ft bgs); Detected Analytes; Result; Qualifier

| Analyte | Generic Direct Contact Soil Standards for Single Chemical: Commercial/ Industrial | Construction |
|---|---|---|
| Arsenic | 77 | 690 |
| Cadmium | 2,600 | 1,000 |
| Chromium, Total | NA | NA |
| Lead | 800 | 400 |
| Manganese | NA | NA |
| Mercury | 3.1 | 3.1 |
| Benzo(a)anthracene | 58,000 | 1,200,000 |
| Benzo(a)pyrene | 5,800 | 120,000 |
| Benzo(b)fluoranthene | 58,000 | 1,200,000 |
| bis(2-Ethylhexyl)phthalate | 3,500,000 | 71,000,000 |
| Dibenz(a,h)anthracene | 5,800 | 120,000 |
| 1,1-Dichloroethene | 1,200,000 | 360,000 |
| Benzene | 140,000 | 1,200,000 |
| cis-1,2-Dichloroethene | 2,400,000 | 2,400,000 |
| Methylene chloride | 3,300,000 | 3,300,000 |
| Tetrachloroethene | 170,000 | 170,000 |
| Trichloroethene | 51,000 | 17,000 |
| Vinyl chloride | 50,000 | 280,000 |
| Total PCBs | 20,000 | 440,000 |

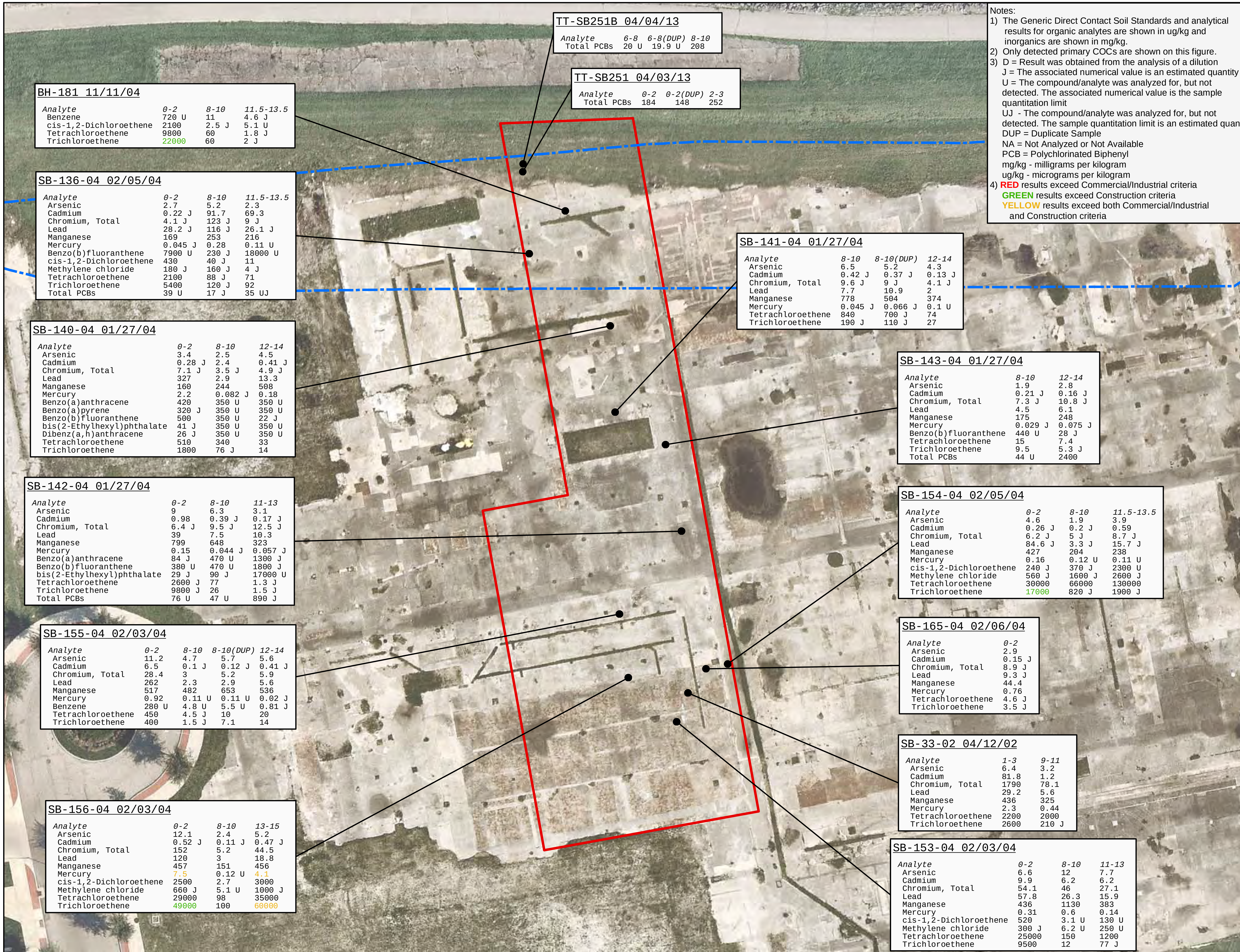
0 25 50
Feet
N

SOURCE: Nearmap 8-24-2018

WESTON SOLUTIONS

FIGURE 2.2
SOIL ANALYTICAL DATA
IDENTIFIED AREA: 3W/6N/16
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 | SCALE AS SHOWN |
|---|---|---|



## TT-SB251B 04/04/13

| Analyte | 6-8 | 6-8(DUP) | 8-10 |
|---|---|---|---|
| Total PCBs | 20 U | 19.9 U | 208 |

## TT-SB251 04/03/13

| Analyte | 0-2 | 0-2(DUP) | 2-3 |
|---|---|---|---|
| Total PCBs | 184 | 148 | 252 |

## BH-181 11/11/04

| Analyte | 0-2 | 8-10 | 11.5-13.5 |
|---|---|---|---|
| Benzene | 720 U | 11 | 4.6 J |
| cis-1,2-Dichloroethene | 2100 | 2.5 J | 5.1 U |
| Tetrachloroethene | 9800 | 60 | 1.8 J |
| Trichloroethene | 22000 | 60 | 2 J |

## SB-136-04 02/05/04

| Analyte | 0-2 | 8-10 | 11.5-13.5 |
|---|---|---|---|
| Arsenic | 2.7 | 5.2 | 2.3 |
| Cadmium | 0.22 J | 91.7 | 69.3 |
| Chromium, Total | 4.1 J | 123 J | 9 J |
| Lead | 28.2 J | 116 J | 26.1 J |
| Manganese | 169 | 253 | 216 |
| Mercury | 0.045 J | 0.28 | 0.11 U |
| Benzo(b)fluoranthene | 7900 U | 230 J | 18000 U |
| cis-1,2-Dichloroethene | 430 | 40 J | 11 |
| Methylene chloride | 180 J | 160 J | 4 J |
| Tetrachloroethene | 2100 | 88 J | 71 |
| Trichloroethene | 5400 | 120 J | 92 |
| Total PCBs | 39 U | 17 J | 35 UJ |

## SB-140-04 01/27/04

| Analyte | 0-2 | 8-10 | 12-14 |
|---|---|---|---|
| Arsenic | 3.4 | 2.5 | 4.5 |
| Cadmium | 0.28 J | 2.4 | 0.41 J |
| Chromium, Total | 7.1 J | 3.5 J | 4.9 J |
| Lead | 327 | 2.9 | 13.3 |
| Manganese | 160 | 244 | 508 |
| Mercury | 2.2 | 0.082 J | 0.18 |
| Benzo(a)anthracene | 420 | 350 U | 350 U |
| Benzo(a)pyrene | 320 J | 350 U | 350 U |
| Benzo(b)fluoranthene | 500 | 350 U | 22 J |
| bis(2-Ethylhexyl)phthalate | 41 J | 350 U | 350 U |
| Dibenz(a,h)anthracene | 26 J | 350 U | 350 U |
| Tetrachloroethene | 510 | 340 | 33 |
| Trichloroethene | 1800 | 76 J | 14 |

## SB-142-04 01/27/04

| Analyte | 0-2 | 8-10 | 11-13 |
|---|---|---|---|
| Arsenic | 9 | 6.3 | 3.1 |
| Cadmium | 0.98 | 0.39 J | 0.17 J |
| Chromium, Total | 6.4 J | 9.5 J | 12.5 J |
| Lead | 39 | 7.5 | 10.3 |
| Manganese | 799 | 648 | 323 |
| Mercury | 0.15 | 0.044 J | 0.057 J |
| Benzo(a)anthracene | 84 J | 470 U | 1300 J |
| Benzo(b)fluoranthene | 380 U | 470 U | 1800 J |
| bis(2-Ethylhexyl)phthalate | 29 J | 90 J | 17000 U |
| Tetrachloroethene | 2600 J | 77 | 1.3 J |
| Trichloroethene | 9800 J | 26 | 1.5 J |
| Total PCBs | 76 U | 47 U | 890 J |

## SB-155-04 02/03/04

| Analyte | 0-2 | 8-10 | 8-10(DUP) | 12-14 |
|---|---|---|---|---|
| Arsenic | 11.2 | 4.7 | 5.7 | 5.6 |
| Cadmium | 6.5 | 0.1 J | 0.12 J | 0.41 J |
| Chromium, Total | 28.4 | 3 | 5.2 | 5.9 |
| Lead | 262 | 2.3 | 2.9 | 5.6 |
| Manganese | 517 | 482 | 653 | 536 |
| Mercury | 0.92 | 0.11 U | 0.11 U | 0.02 J |
| Benzene | 280 U | 4.8 U | 5.5 U | 0.81 J |
| Tetrachloroethene | 450 | 4.5 J | 10 | 20 |
| Trichloroethene | 400 | 1.5 J | 7.1 | 14 |

## SB-156-04 02/03/04

| Analyte | 0-2 | 8-10 | 13-15 |
|---|---|---|---|
| Arsenic | 12.1 | 2.4 | 5.2 |
| Cadmium | 0.52 J | 0.11 J | 0.47 J |
| Chromium, Total | 152 | 5.2 | 44.5 |
| Lead | 120 | 3 | 18.8 |
| Manganese | 457 | 151 | 456 |
| Mercury | 7.5 | 0.12 U | 4.1 |
| cis-1,2-Dichloroethene | 2500 | 2.7 | 3000 |
| Methylene chloride | 660 J | 5.1 U | 1000 J |
| Tetrachloroethene | 29000 | 98 | 35000 |
| Trichloroethene | 49000 | 100 | 60000 |

## SB-141-04 01/27/04

| Analyte | 8-10 | 8-10(DUP) | 12-14 |
|---|---|---|---|
| Arsenic | 6.5 | 5.2 | 4.3 |
| Cadmium | 0.42 J | 0.37 J | 0.13 J |
| Chromium, Total | 9.6 J | 9 J | 4.1 J |
| Lead | 7.7 | 10.9 | 2 |
| Manganese | 778 | 504 | 374 |
| Mercury | 0.045 J | 0.066 J | 0.1 U |
| Tetrachloroethene | 840 | 700 J | 74 |
| Trichloroethene | 190 J | 110 J | 27 |

## SB-143-04 01/27/04

| Analyte | 8-10 | 12-14 |
|---|---|---|
| Arsenic | 1.9 | 2.8 |
| Cadmium | 0.21 J | 0.16 J |
| Chromium, Total | 7.3 J | 10.8 J |
| Lead | 4.5 | 6.1 |
| Manganese | 175 | 248 |
| Mercury | 0.029 J | 0.075 J |
| Benzo(b)fluoranthene | 440 U | 28 J |
| Tetrachloroethene | 15 | 7.4 |
| Trichloroethene | 9.5 | 5.3 J |
| Total PCBs | 44 U | 2400 |

## SB-154-04 02/05/04

| Analyte | 0-2 | 8-10 | 11.5-13.5 |
|---|---|---|---|
| Arsenic | 4.6 | 1.9 | 3.9 |
| Cadmium | 0.26 J | 0.2 J | 0.59 |
| Chromium, Total | 6.2 J | 5 J | 8.7 J |
| Lead | 84.6 J | 3.3 J | 15.7 J |
| Manganese | 427 | 204 | 238 |
| Mercury | 0.16 | 0.12 U | 0.11 U |
| cis-1,2-Dichloroethene | 240 J | 370 J | 2300 U |
| Methylene chloride | 560 J | 1600 J | 2600 J |
| Tetrachloroethene | 30000 | 66000 | 130000 |
| Trichloroethene | 17000 | 820 J | 1900 J |

## SB-165-04 02/06/04

| Analyte | 0-2 |
|---|---|
| Arsenic | 2.9 |
| Cadmium | 0.15 J |
| Chromium, Total | 8.9 J |
| Lead | 9.3 J |
| Manganese | 44.4 |
| Mercury | 0.76 |
| Tetrachloroethene | 4.6 J |
| Trichloroethene | 3.5 J |

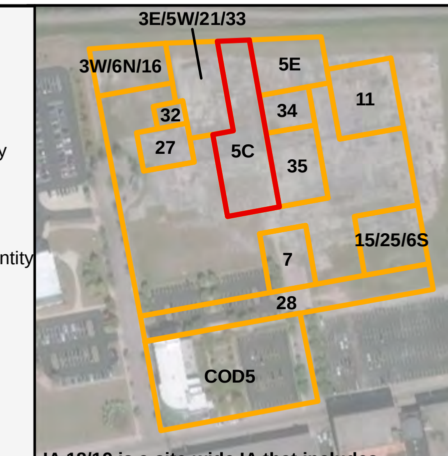
## SB-33-02 04/12/02

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 6.4 | 3.2 |
| Cadmium | 81.8 | 1.2 |
| Chromium, Total | 1790 | 78.1 |
| Lead | 29.2 | 5.6 |
| Manganese | 436 | 325 |
| Mercury | 2.3 | 0.44 |
| Tetrachloroethene | 2200 | 2000 |
| Trichloroethene | 2600 | 210 J |

## SB-153-04 02/03/04

| Analyte | 0-2 | 8-10 | 11-13 |
|---|---|---|---|
| Arsenic | 6.6 | 12 | 7.7 |
| Cadmium | 9.9 | 6.2 | 6.2 |
| Chromium, Total | 54.1 | 46 | 27.1 |
| Lead | 57.8 | 26.3 | 15.9 |
| Manganese | 436 | 1130 | 383 |
| Mercury | 0.31 | 0.6 | 0.14 |
| cis-1,2-Dichloroethene | 520 | 3.1 U | 130 U |
| Methylene chloride | 300 J | 6.2 U | 250 U |
| Tetrachloroethene | 25000 | 150 | 1200 |
| Trichloroethene | 9500 | 12 | 77 J |

Notes:
1) The Generic Direct Contact Soil Standards and analytical results for organic analytes are shown in ug/kg and inorganics are shown in mg/kg.
2) Only detected primary COCs are shown on this figure.
3) D = Result was obtained from the analysis of a dilution
J = The associated numerical value is an estimated quantity
U = The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity
DUP = Duplicate Sample
NA = Not Analyzed or Not Available
PCB = Polychlorinated Biphenyl
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
4) RED results exceed Commercial/Industrial criteria
GREEN results exceed Construction criteria
YELLOW results exceed both Commercial/Industrial and Construction criteria




IA 18/19 is a site-wide IA that includes storm and process sewers.

LEGEND

- Soil Sample Locations With Detected Contaminants of Concern
- Soil Sample Locations With No Detected Contaminants of Concern
- Area of Proposed Soil Cover
- Identified Areas

| Station Name: TT-PCB-650 | Sample Date: 05/02/14 | |
|---|---|---|
| Analyte | 0-3 | 3-12 (Depth (ft bgs)) |
| Total PCBs | 6100 | 1700 J |

Detected Analytes — Result — Qualifier

| Analyte | Generic Direct Contact Soil Standards for Single Chemical: Commercial/ Industrial | Construction |
|---|---|---|
| Arsenic | 77 | 690 |
| Cadmium | 2,600 | 1,000 |
| Chromium, Total | NA | NA |
| Lead | 800 | 400 |
| Manganese | NA | NA |
| Mercury | 3.1 | 3.1 |
| Benzo(a)anthracene | 58,000 | 1,200,000 |
| Benzo(a)pyrene | 5,800 | 120,000 |
| Benzo(b)fluoranthene | 58,000 | 1,200,000 |
| bis(2-Ethylhexyl)phthalate | 3,500,000 | 71,000,000 |
| Dibenz(a,h)anthracene | 5,800 | 120,000 |
| 1,1-Dichloroethene | 1,200,000 | 360,000 |
| Benzene | 140,000 | 1,200,000 |
| cis-1,2-Dichloroethene | 2,400,000 | 2,400,000 |
| Methylene chloride | 3,300,000 | 3,300,000 |
| Tetrachloroethene | 170,000 | 170,000 |
| Trichloroethene | 51,000 | 17,000 |
| Vinyl chloride | 50,000 | 280,000 |
| Total PCBs | 20,000 | 440,000 |

0 25 50 Feet — N

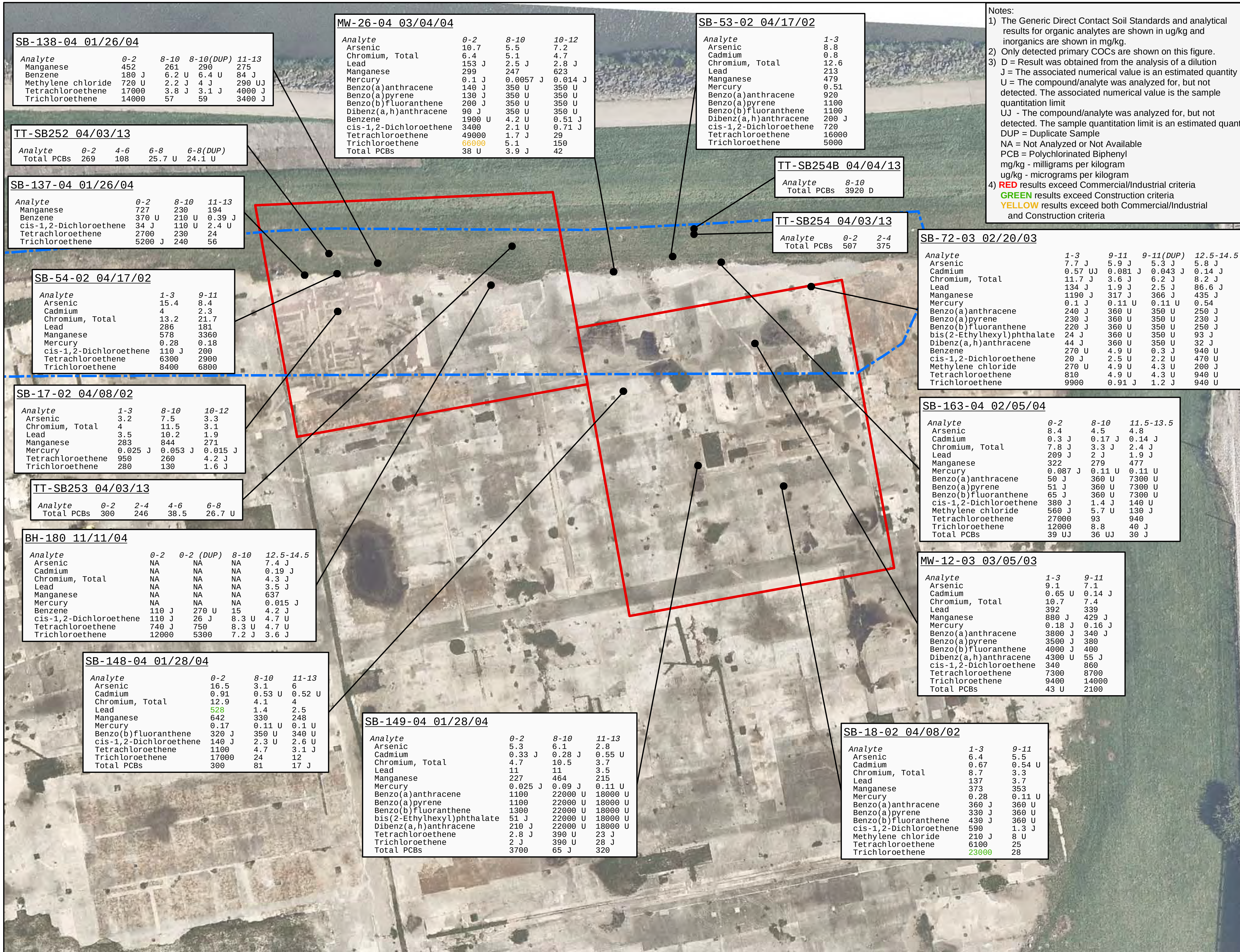
SOURCE: Nearmap 8-24-2018

WESTON SOLUTIONS

FIGURE 2.3
SOIL ANALYTICAL DATA
IDENTIFIED AREA: 5C
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 2_3 Soil Data IA 5C_200429.mxd 9:26:20 AM 4/29/2020 MYERSJT



## SB-138-04 01/26/04

| Analyte | 0-2 | 8-10 | 8-10(DUP) | 11-13 |
|---|---|---|---|---|
| Manganese | 452 | 261 | 290 | 275 |
| Benzene | 180 J | 6.2 U | 6.4 U | 84 J |
| Methylene chloride | 720 U | 2.2 J | 4 J | 290 UJ |
| Tetrachloroethene | 17000 | 3.8 J | 3.1 J | 4000 J |
| Trichloroethene | 14000 | 57 | 59 | 3400 J |

## TT-SB252 04/03/13

| Analyte | 0-2 | 4-6 | 6-8 | 6-8(DUP) |
|---|---|---|---|---|
| Total PCBs | 269 | 108 | 25.7 U | 24.1 U |

## SB-137-04 01/26/04

| Analyte | 0-2 | 8-10 | 11-13 |
|---|---|---|---|
| Manganese | 727 | 230 | 194 |
| Benzene | 370 U | 210 U | 0.39 J |
| cis-1,2-Dichloroethene | 34 J | 110 U | 2.4 U |
| Tetrachloroethene | 2700 | 230 | 24 |
| Trichloroethene | 5200 J | 240 | 56 |

## SB-54-02 04/17/02

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 15.4 | 8.4 |
| Cadmium | 4 | 2.3 |
| Chromium, Total | 13.2 | 21.7 |
| Lead | 286 | 181 |
| Manganese | 578 | 3360 |
| Mercury | 0.28 | 0.18 |
| cis-1,2-Dichloroethene | 110 J | 200 |
| Tetrachloroethene | 6300 | 2900 |
| Trichloroethene | 8400 | 6800 |

## SB-17-02 04/08/02

| Analyte | 1-3 | 8-10 | 10-12 |
|---|---|---|---|
| Arsenic | 3.2 | 7.5 | 3.3 |
| Chromium, Total | 4 | 11.5 | 3.1 |
| Lead | 3.5 | 10.2 | 1.9 |
| Manganese | 283 | 844 | 271 |
| Mercury | 0.025 J | 0.053 J | 0.015 J |
| Tetrachloroethene | 950 | 260 | 4.2 J |
| Trichloroethene | 280 | 130 | 1.6 J |

## TT-SB253 04/03/13

| Analyte | 0-2 | 2-4 | 4-6 | 6-8 |
|---|---|---|---|---|
| Total PCBs | 300 | 246 | 38.5 | 26.7 U |

## BH-180 11/11/04

| Analyte | 0-2 | 0-2 (DUP) | 8-10 | 12.5-14.5 |
|---|---|---|---|---|
| Arsenic | NA | NA | NA | 7.4 J |
| Cadmium | NA | NA | NA | 0.19 J |
| Chromium, Total | NA | NA | NA | 4.3 J |
| Lead | NA | NA | NA | 3.5 J |
| Manganese | NA | NA | NA | 637 |
| Mercury | NA | NA | NA | 0.015 J |
| Benzene | 110 J | 270 U | 15 | 4.2 J |
| cis-1,2-Dichloroethene | 110 J | 26 J | 8.3 U | 4.7 U |
| Tetrachloroethene | 740 J | 750 | 8.3 U | 4.7 U |
| Trichloroethene | 12000 | 5300 | 7.2 J | 3.6 J |

## SB-148-04 01/28/04

| Analyte | 0-2 | 8-10 | 11-13 |
|---|---|---|---|
| Arsenic | 16.5 | 3.1 | 6 |
| Cadmium | 0.91 | 0.53 U | 0.52 U |
| Chromium, Total | 12.9 | 4.1 | 4 |
| Lead | 528 | 1.4 | 2.5 |
| Manganese | 642 | 330 | 248 |
| Mercury | 0.17 | 0.11 U | 0.1 U |
| Benzo(b)fluoranthene | 320 J | 350 U | 340 U |
| cis-1,2-Dichloroethene | 140 J | 2.3 U | 2.6 U |
| Tetrachloroethene | 1100 | 4.7 | 3.1 J |
| Trichloroethene | 17000 | 24 | 12 |
| Total PCBs | 300 | 81 | 17 J |

## MW-26-04 03/04/04

| Analyte | 0-2 | 8-10 | 10-12 |
|---|---|---|---|
| Arsenic | 10.7 | 5.5 | 7.2 |
| Chromium, Total | 6.4 | 5.1 | 4.7 |
| Lead | 153 J | 2.5 J | 2.8 J |
| Manganese | 299 | 247 | 623 |
| Mercury | 0.1 J | 0.0057 J | 0.014 J |
| Benzo(a)anthracene | 140 J | 350 U | 350 U |
| Benzo(a)pyrene | 130 J | 350 U | 350 U |
| Benzo(b)fluoranthene | 200 J | 350 U | 350 U |
| Dibenz(a,h)anthracene | 90 J | 350 U | 350 U |
| Benzene | 1900 U | 4.2 U | 0.51 J |
| cis-1,2-Dichloroethene | 3400 | 2.1 U | 0.71 J |
| Tetrachloroethene | 49000 | 1.7 J | 29 |
| Trichloroethene | 66000 | 5.1 | 150 |
| Total PCBs | 38 U | 3.9 J | 42 |

## SB-53-02 04/17/02

| Analyte | 1-3 |
|---|---|
| Arsenic | 8.8 |
| Cadmium | 0.8 |
| Chromium, Total | 12.6 |
| Lead | 213 |
| Manganese | 479 |
| Mercury | 0.51 |
| Benzo(a)anthracene | 920 |
| Benzo(a)pyrene | 1100 |
| Benzo(b)fluoranthene | 1100 |
| Dibenz(a,h)anthracene | 200 J |
| cis-1,2-Dichloroethene | 720 |
| Tetrachloroethene | 16000 |
| Trichloroethene | 5000 |

## TT-SB254B 04/04/13

| Analyte | 8-10 |
|---|---|
| Total PCBs | 3920 D |

## TT-SB254 04/03/13

| Analyte | 0-2 | 2-4 |
|---|---|---|
| Total PCBs | 507 | 375 |

## SB-72-03 02/20/03

| Analyte | 1-3 | 9-11 | 9-11(DUP) | 12.5-14.5 |
|---|---|---|---|---|
| Arsenic | 7.7 J | 5.9 J | 5.3 J | 5.8 J |
| Cadmium | 0.57 UJ | 0.081 J | 0.043 J | 0.14 J |
| Chromium, Total | 11.7 J | 3.6 J | 6.2 J | 8.2 J |
| Lead | 134 J | 1.9 J | 2.5 J | 86.6 J |
| Manganese | 1190 J | 317 J | 366 J | 435 J |
| Mercury | 0.1 J | 0.11 U | 0.11 U | 0.54 |
| Benzo(a)anthracene | 240 J | 360 U | 350 U | 250 J |
| Benzo(a)pyrene | 230 J | 360 U | 350 U | 230 J |
| Benzo(b)fluoranthene | 220 J | 360 U | 350 U | 250 J |
| bis(2-Ethylhexyl)phthalate | 24 J | 360 U | 350 U | 93 J |
| Dibenz(a,h)anthracene | 44 J | 360 U | 350 U | 32 J |
| Benzene | 270 U | 4.9 U | 0.3 J | 940 U |
| cis-1,2-Dichloroethene | 20 J | 2.5 U | 2.2 U | 470 U |
| Methylene chloride | 270 U | 4.9 U | 4.3 U | 200 J |
| Tetrachloroethene | 810 | 4.9 U | 4.3 U | 940 U |
| Trichloroethene | 9900 | 0.91 J | 1.2 J | 940 U |

## SB-163-04 02/05/04

| Analyte | 0-2 | 8-10 | 11.5-13.5 |
|---|---|---|---|
| Arsenic | 8.4 | 4.5 | 4.8 |
| Cadmium | 0.3 J | 0.17 J | 0.14 J |
| Chromium, Total | 7.8 J | 3.3 J | 2.4 J |
| Lead | 209 J | 2 J | 1.9 J |
| Manganese | 322 | 279 | 477 |
| Mercury | 0.087 J | 0.11 U | 0.11 U |
| Benzo(a)anthracene | 50 J | 360 U | 7300 U |
| Benzo(a)pyrene | 51 J | 360 U | 7300 U |
| Benzo(b)fluoranthene | 65 J | 360 U | 7300 U |
| cis-1,2-Dichloroethene | 380 J | 1.4 J | 140 U |
| Methylene chloride | 560 J | 5.7 U | 130 J |
| Tetrachloroethene | 27000 | 93 | 940 |
| Trichloroethene | 12000 | 8.8 | 40 J |
| Total PCBs | 39 UJ | 36 UJ | 30 J |

## MW-12-03 03/05/03

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 9.1 | 7.1 |
| Cadmium | 0.65 U | 0.14 J |
| Chromium, Total | 10.7 | 7.4 |
| Lead | 392 | 339 |
| Manganese | 880 J | 429 J |
| Mercury | 0.18 J | 0.16 J |
| Benzo(a)anthracene | 3800 J | 340 J |
| Benzo(a)pyrene | 3500 J | 380 |
| Benzo(b)fluoranthene | 4000 J | 400 |
| Dibenz(a,h)anthracene | 4300 U | 55 J |
| cis-1,2-Dichloroethene | 340 | 860 |
| Tetrachloroethene | 7300 | 8700 |
| Trichloroethene | 9400 | 14000 |
| Total PCBs | 43 U | 2100 |

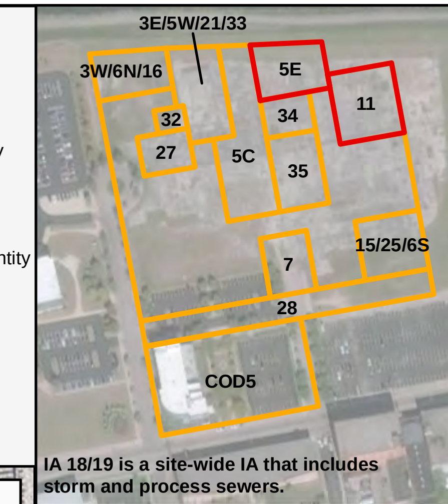
## SB-149-04 01/28/04

| Analyte | 0-2 | 8-10 | 11-13 |
|---|---|---|---|
| Arsenic | 5.3 | 6.1 | 2.8 |
| Cadmium | 0.33 J | 0.28 J | 0.55 U |
| Chromium, Total | 4.7 | 10.5 | 3.7 |
| Lead | 11 | 11 | 3.5 |
| Manganese | 227 | 464 | 215 |
| Mercury | 0.025 J | 0.09 J | 0.11 U |
| Benzo(a)anthracene | 1100 | 22000 U | 18000 U |
| Benzo(a)pyrene | 1100 | 22000 U | 18000 U |
| Benzo(b)fluoranthene | 1300 | 22000 U | 18000 U |
| bis(2-Ethylhexyl)phthalate | 51 J | 22000 U | 18000 U |
| Dibenz(a,h)anthracene | 210 J | 22000 U | 18000 U |
| Tetrachloroethene | 2.8 J | 390 U | 23 J |
| Trichloroethene | 2 J | 390 U | 28 J |
| Total PCBs | 3700 | 65 J | 320 |

## SB-18-02 04/08/02

| Analyte | 1-3 | 9-11 |
|---|---|---|
| Arsenic | 6.4 | 5.5 |
| Cadmium | 0.67 | 0.54 U |
| Chromium, Total | 8.7 | 3.3 |
| Lead | 137 | 3.7 |
| Manganese | 373 | 353 |
| Mercury | 0.28 | 0.11 U |
| Benzo(a)anthracene | 360 J | 360 U |
| Benzo(a)pyrene | 330 J | 360 U |
| Benzo(b)fluoranthene | 430 J | 360 U |
| cis-1,2-Dichloroethene | 590 | 1.3 J |
| Methylene chloride | 210 J | 8 U |
| Tetrachloroethene | 6100 | 25 |
| Trichloroethene | 23000 | 28 |

Notes:
1) The Generic Direct Contact Soil Standards and analytical results for organic analytes are shown in ug/kg and inorganics are shown in mg/kg.
2) Only detected primary COCs are shown on this figure.
3) D = Result was obtained from the analysis of a dilution
J = The associated numerical value is an estimated quantity
U = The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity
DUP = Duplicate Sample
NA = Not Analyzed or Not Available
PCB = Polychlorinated Biphenyl
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
4) **RED** results exceed Commercial/Industrial criteria
**GREEN** results exceed Construction criteria
**YELLOW** results exceed both Commercial/Industrial and Construction criteria




LEGEND

- ● Soil Sample Locations With Detected Contaminants of Concern
- ● Soil Sample Locations With No Detected Contaminants of Concern
- Area of Proposed Soil Cover
- Identified Areas

Station Name → TT-PCB-650 ; Sample Date → 05/02/14

| Analyte | 0-3 | 3-12 |
|---|---|---|
| Total PCBs | 6100 | 1700 J |

Depth (ft bgs); Detected Analytes; Result; Qualifier

| Analyte | Generic Direct Contact Soil Standards for Single Chemical: Commercial/ Industrial | Construction |
|---|---|---|
| Arsenic | 77 | 690 |
| Cadmium | 2,600 | 1,000 |
| Chromium, Total | NA | NA |
| Lead | 800 | 400 |
| Manganese | NA | NA |
| Mercury | 3.1 | 3.1 |
| Benzo(a)anthracene | 58,000 | 1,200,000 |
| Benzo(a)pyrene | 5,800 | 120,000 |
| Benzo(b)fluoranthene | 58,000 | 1,200,000 |
| bis(2-Ethylhexyl)phthalate | 3,500,000 | 71,000,000 |
| Dibenz(a,h)anthracene | 5,800 | 120,000 |
| 1,1-Dichloroethene | 1,200,000 | 360,000 |
| Benzene | 140,000 | 1,200,000 |
| cis-1,2-Dichloroethene | 2,400,000 | 2,400,000 |
| Methylene chloride | 3,300,000 | 3,300,000 |
| Tetrachloroethene | 170,000 | 170,000 |
| Trichloroethene | 51,000 | 17,000 |
| Vinyl chloride | 50,000 | 280,000 |
| Total PCBs | 20,000 | 440,000 |

0 25 50
Feet
N

SOURCE: Nearmap 8-24-2018

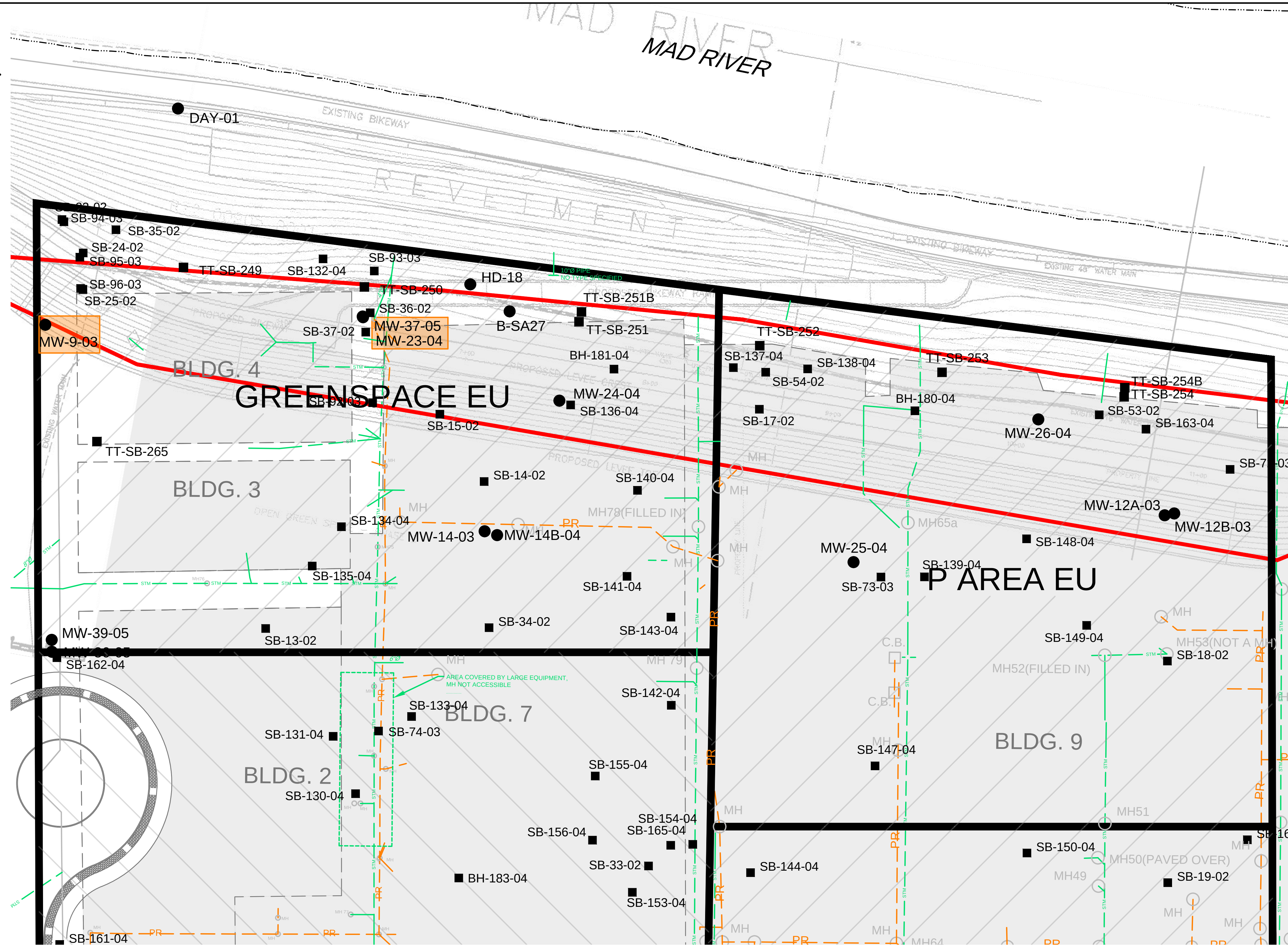
FIGURE 2.4
SOIL ANALYTICAL DATA
IDENTIFIED AREAS: 5E and 11
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 2_4 Soil Data IA 5E_11_200429.mxd 9:27:26 AM 4/29/2020 MYERSJT

## LEGEND

- FORMER BUILDING FOOTPRINT
- MAD RIVER SHORELINE
- REMAINING BUILDING SLAB
- FORMER PROCESS SEWER LINE
- FORMER STORM SEWER LINE
- EXPOSURE UNIT (EU)
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- MAY 2015 GROUNDWATER CONCENTRATIONS EXCEED VAPOR INTRUSION SCREENING LEVEL (VISL); WILL BE ADDRESSED BY THE ENVIRONMENTAL COVENANT
- CUMULATIVE RISK RATIO FOR SOIL (0-12 FT BGS) EXCEEDS 1 FOR DIRECT CONTACT EXPOSURE PATHWAY FOR CONSTRUCTION WORKER RECEPTOR. RISK MITIGATION REQUIRED.
- CUMULATIVE RISK RATIO FOR SURFACE SOIL (0-3 FT BGS) EXCEEDS 1 FOR DIRECT CONTACT EXPOSURE PATHWAY FOR COMMERCIAL/INDUSTRIAL RECEPTOR. REMEDIATION OR MITIGATION REQUIRED.
- AREA OF PROPOSED SOIL COVER



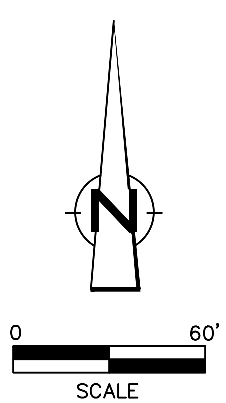




FIGURE 2.5

WESTON SOLUTIONS

714 E. Monument Ave.
Suite 215
Dayton, Ohio
45402

LOCATIONS EXCEEDING RISK SCREENING LEVELS
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
Dayton, Ohio

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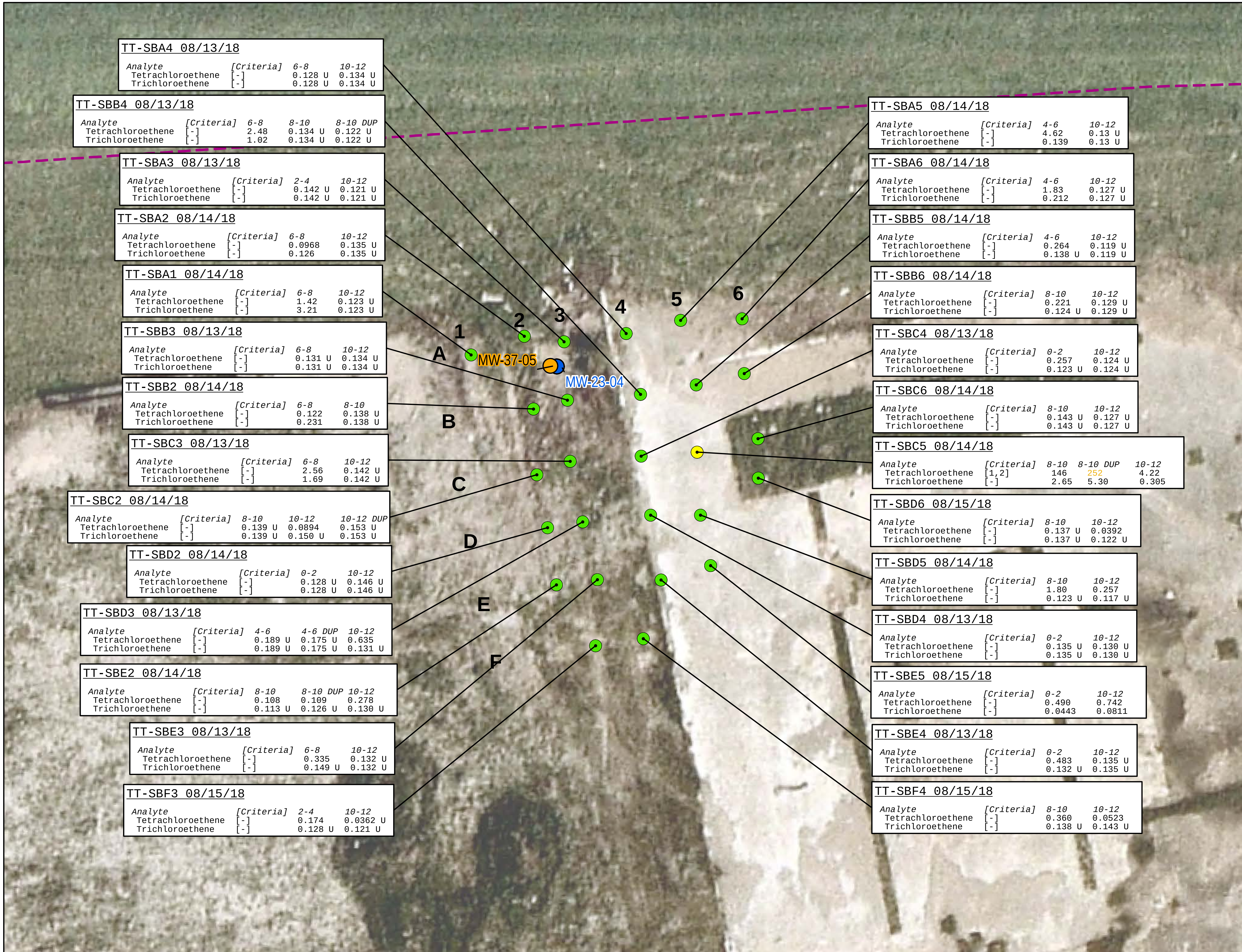



LEGEND

- Soil Sample Exceeds Criteria
- Soil Sample Does Not Exceed Criteria
- Upper Aquifer -Water Table
- Upper Aquifer -Top of Till
- East Phase Boundary
- West Phase Boundary

Notes:
- All units in mg/kg
- U = non-detect
- DUP = duplicate result
- RED results exceed Commercial/Industrial criteria
- GREEN results exceed Construction criteria
- YELLOW results exceed both Commercial/Industrial and Construction criteria

| | Generic Direct Contact Soil Standards for Single Chemical (2019) | |
|---|---|---|
| Analyte | Commercial/ Industrial [2] | Construction [1] |
| Tetrachloroethene | 170 | 170 |
| Trichloroethene | 48 | 17 |



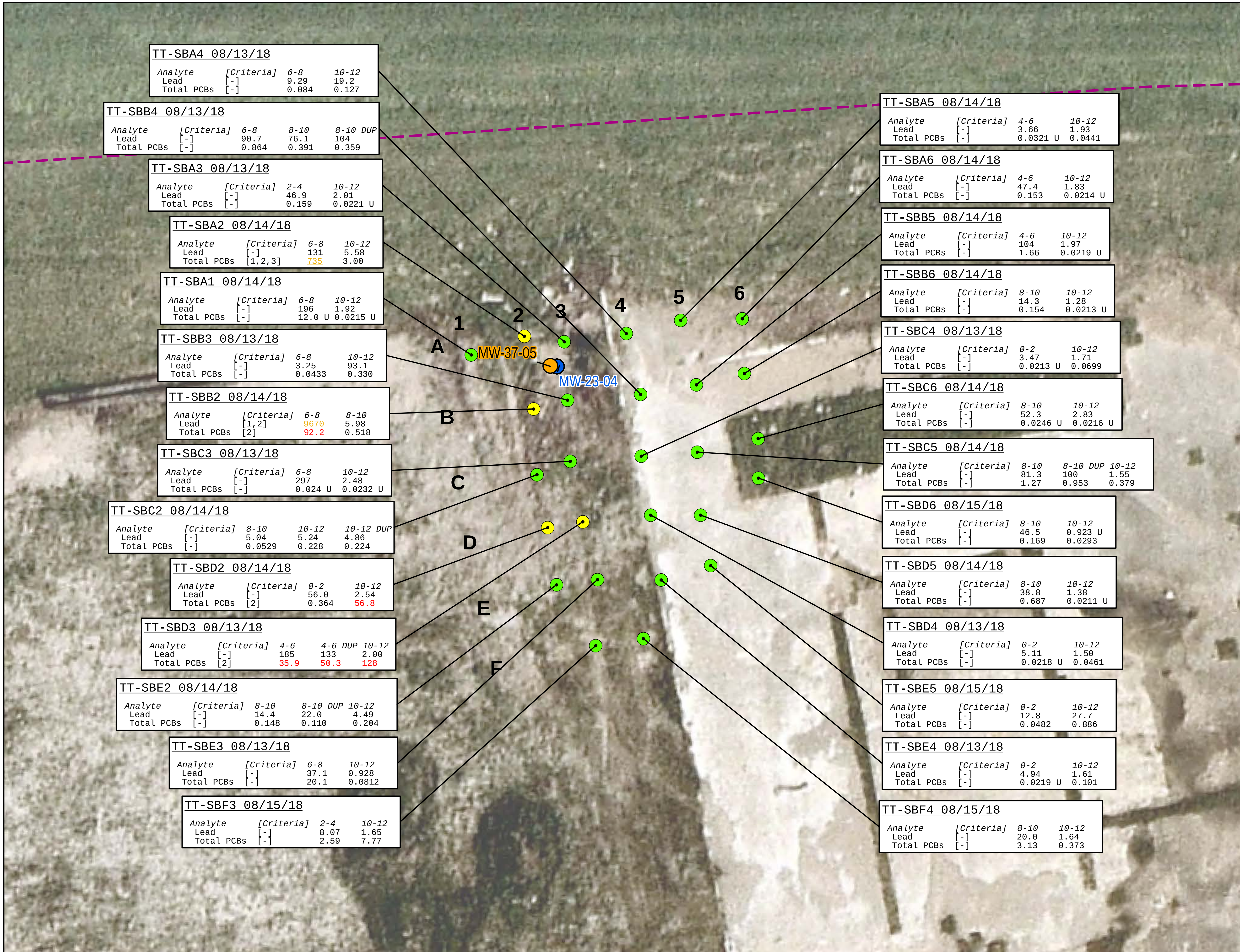
AERIAL SOURCE: Nearmap 8-24-2018

WESTON SOLUTIONS

FIGURE 2.6
TCE AND PCE IN SOIL
AUGUST 2018
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0590 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 2_6 Soil PCE and TCE Results - August 2018_200429.mxd 9:28:49 AM 4/29/2020 MYERSJT




## LEGEND

- Soil Sample Exceeds Criteria
- Soil Sample Does Not Exceed Criteria
- Upper Aquifer -Water Table
- Upper Aquifer -Top of Till
- East Phase Boundary
- West Phase Boundary

Notes:
- All units in mg/kg
- U = non-detect
- DUP = duplicate result
- **RED** results exceed Commercial/Industrial criteria
- **GREEN** results exceed Construction criteria
- **YELLOW** results exceed both Commercial/Industrial and Construction criteria
- [3] Total PCB result exceeds site-specific single chemical PCB soil standard protective of short-term exposure (226 mg/kg). Result is underlined

| | Generic Direct Contact Soil Standards for Single Chemical (2019) | |
|---|---|---|
| Analyte | Commercial/ Industrial [2] | Construction [1] |
| Lead | 800 | 400 |
| Total PCBs | 30 | 490 |

Station Name
Sample Date
Depth (ft bgs)

TT-SBD6 08/15/18

| Analyte | [Criteria] | 8-10 | 10-12 |
|---|---|---|---|
| Lead | [-] | 46.5 | 0.923 U |
| Total PCBs | [-] | 0.169 | 0.0293 |

N

0 15 30
Feet

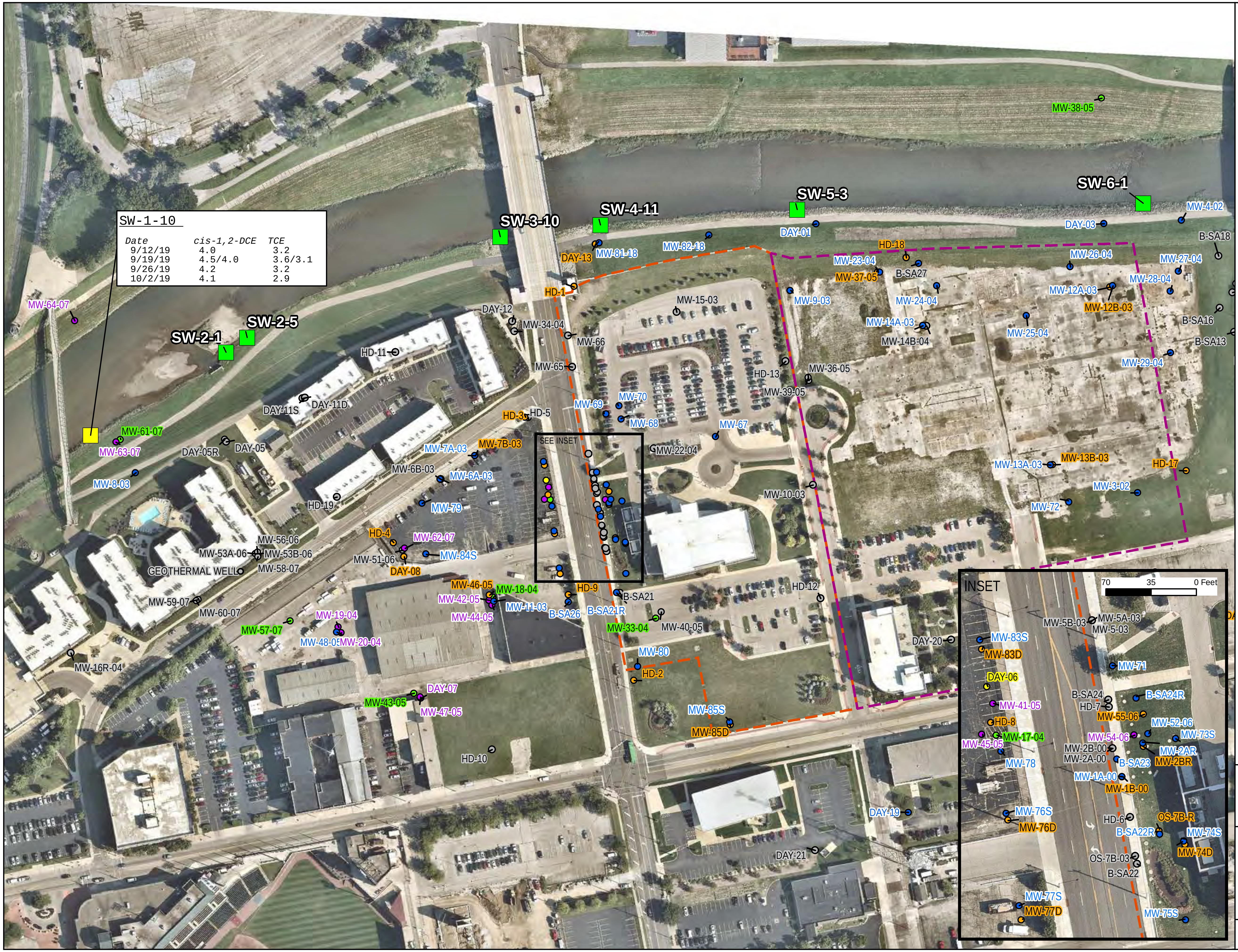
AERIAL SOURCE: Nearmap 8-24-2018

WESTON SOLUTIONS

FIGURE 2.7
PCBs AND LEAD IN SOIL
AUGUST 2018
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0590 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 2_7 Soil PCBs and Lead Results August 2018_200429.mxd 9:31:19 AM 4/29/2020 MYERSJT




LEGEND

- East Phase Boundary
- West Phase Boundary
- Upper Aquifer - Water Table
- Upper Aquifer - Intermediate
- Upper Aquifer - Top of Till
- Till Rich Zone
- Lower Aquifer
- Inactive/Abandoned
- Surface Water Sample Location with Detected VOCs
- Surface Water Sample Location with No Detected VOCs

Notes
- only detected results shown
- all results in ug/l
- value shown after "/" indicates duplicate result
- cis-1,2-DCE = cis-1,2-Dichloroethene
- TCE = trichloroethene
- VOC = volatile organic compound

N

0 175 350
Feet

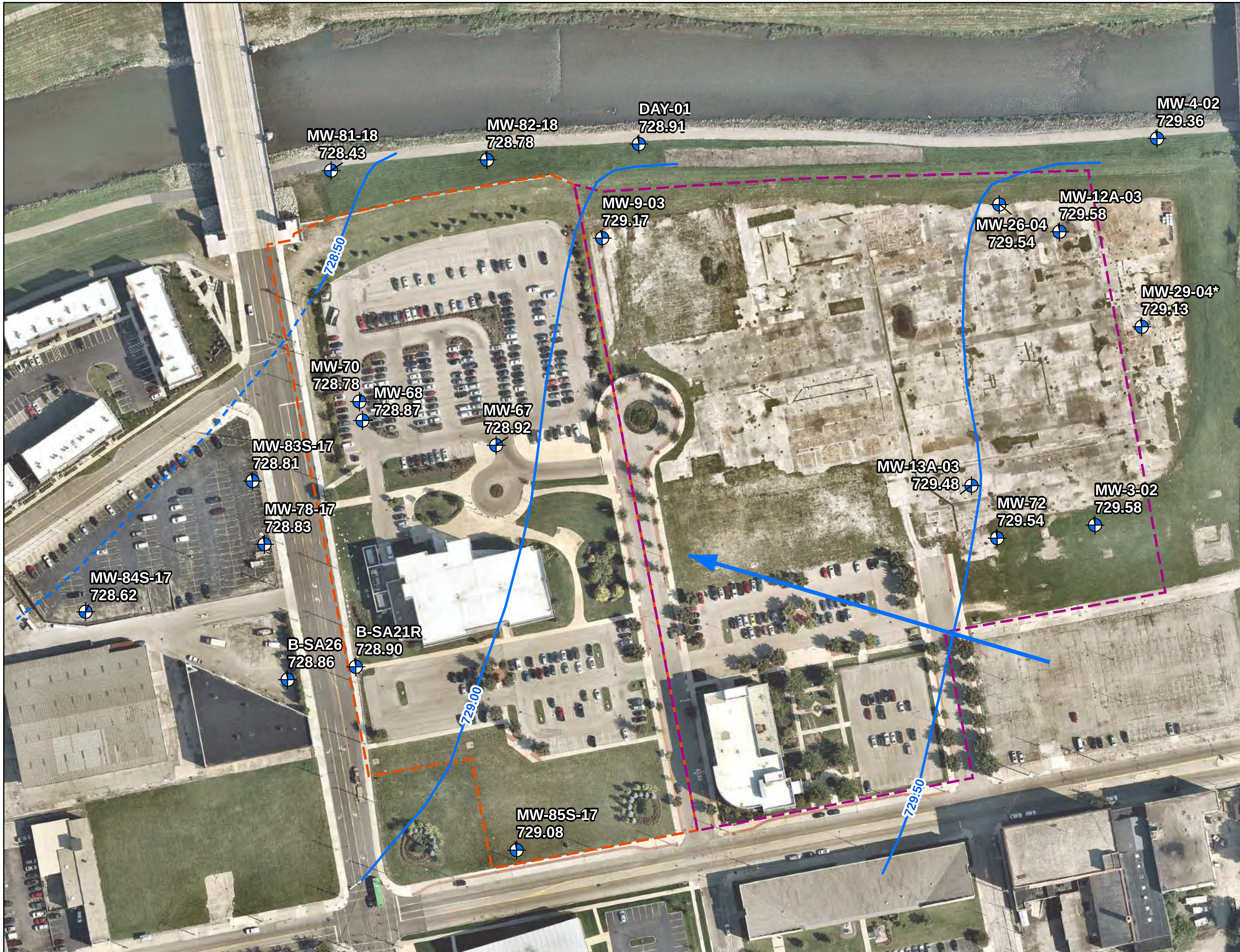
SOURCE: Nearmap August 24, 2018

WESTON SOLUTIONS

FIGURE 2.8
SURFACE WATER SAMPLE VOC ANALYTICAL RESULTS - SEPT/OCT 2019
FORMER GM DELPHI HARRISON THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| | PROJECT NO | SCALE |
|---|---|---|
| APR 2020 | 12473.005.010.4002 | AS SHOWN |

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 2-8 Surface Water Sampling VOC Results_200429.mxd 9:32:50 AM 4/29/2020 MYERSJT




LEGEND

- Monitoring Well with Groundwater Elevation Shown in Feet Above Mean Sea Level (AMSL)
- Potentiometric Surface 06 May 2019
- Groundwater Flow Direction
- East Phase Boundary
- West Phase Boundary

**Notes:**
- Generalized potentiometric surface contours are depicted; some localized flow vector variations occur
- All wells screened in the Upper Aquifer

N

0 125 250

Feet

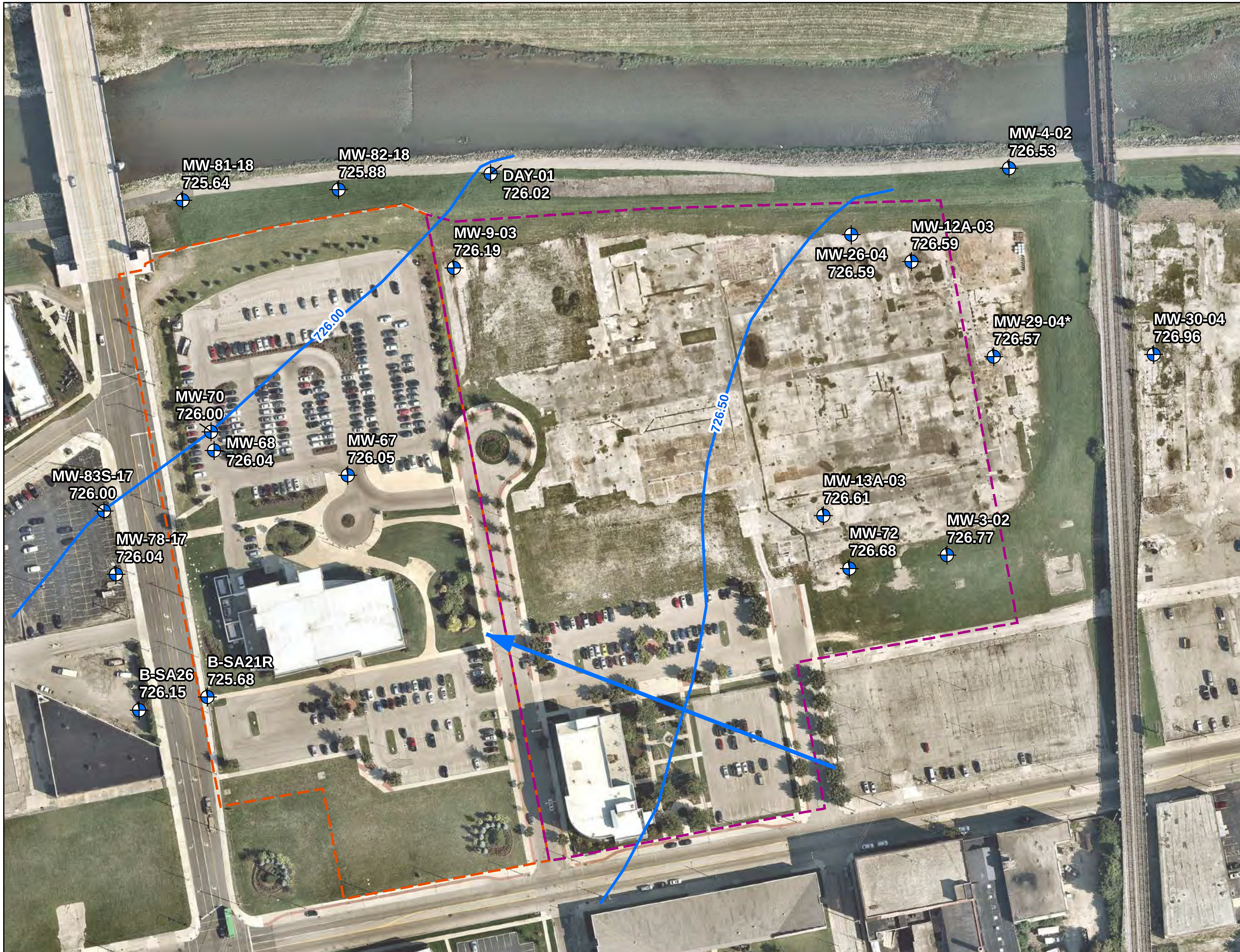
AERIAL SOURCE: Nearmap August 24, 2018

WESTON SOLUTIONS

FIGURE 3.1
MAY 2019
POTENTIOMETRIC SURFACE MAP
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0590 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 3-1 Potentiometric Surface May 2019_200429.mxd 9:33:16 AM 4/29/2020 MYERSJT




LEGEND

- Monitoring Well with Groundwater Elevation Shown in Feet Above Mean Sea Level (AMSL)
- Potentiometric Surface 13 November 2019
- Groundwater Flow Direction
- East Phase Boundary
- West Phase Boundary

**Notes:**
- Generalized potentiometric surface contours are depicted; some localized flow vector variations occur
- All wells screened in the Upper Aquifer

N

0 125 250
Feet

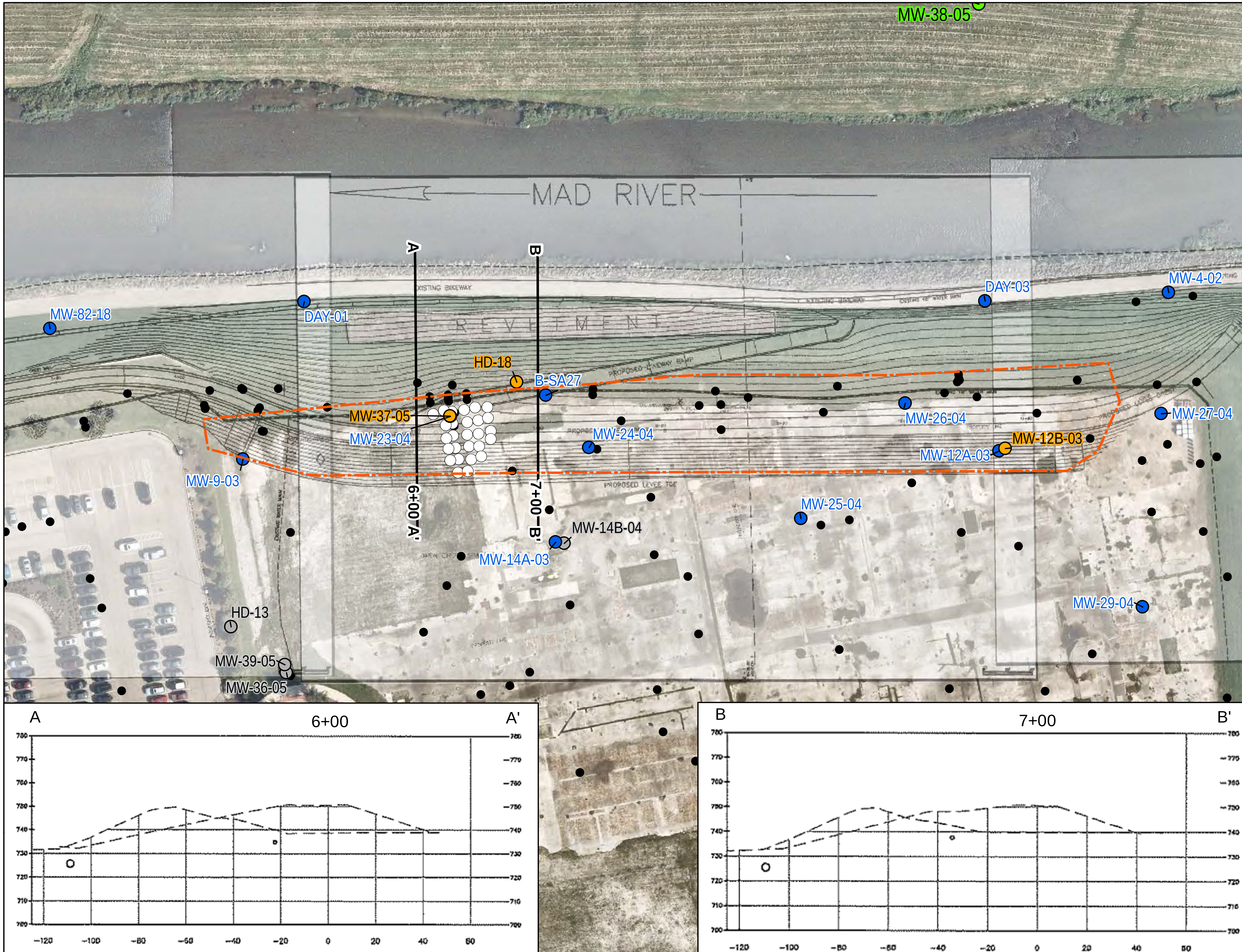
AERIAL SOURCE: Nearmap August 24, 2018

WESTON SOLUTIONS

FIGURE 3.2
NOVEMBER 2019
POTENTIOMETRIC SURFACE MAP
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0590 | SCALE AS SHOWN |
|---|---|---|

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 3-2 Potentiometric Surface Nov 2019_200429.mxd 9:33:41 AM 4/29/2020 MYERSJT




LEGEND

- Upper Aquifer - Water Table
- Upper Aquifer - Top of Till
- Abandoned Monitoring Well
- August 2018 Soil Sample Location
- Historical Soil Sample Location
- MCD Cross Section Location
- Area of Proposed Soil Cover

Notes:
- Miami Conservancy District (MCD) proposed levee modiciation drawings dated 7-26-2019 overlayed
- MCD cross sections of proposed levee modifications shown in AOI 3 area
- AOI = area of interest

SOURCE: Nearmap 8-24-18

WESTON SOLUTIONS

FIGURE 5.1
PROPOSED LEVEE MODIFICATIONS
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| | | |
|---|---|---|
| APR 2020 | PROJECT NO 12473.005.008.0450 | SCALE AS SHOWN |

FILE: E:\Dayton Technology Campus\GIS\2020\Figure 5-1 Levee Mods_200429.mxd 9:42:23 AM 4/29/2020 MYERSJT

# TABLES

# TABLE 1.1
## SUMMARY OF ANALYTICAL RESULTS FOR SOIL PLACED IN EXISTING BERM
## NORTHERN PORTION OF TECH TOWN PROPERTY
## DAYTON, OHIO

| FieldSampleID | Reporting Units | C/I GDCSS | Const. GDCSS | S-1 | | S-2 | | S-3 | | TT-TSSP-01-C | TT-TSSP-01-G | TT-TSSP-02-C | TT-TSSP-02-G | TT-TSSP-03-C | TT-TSSP-03-G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | | | | 2/13/2009 | 2/13/2009 | 2/13/2009 | 2/13/2009 | 2/13/2009 | 2/13/2009 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 |
| **VOCs** | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ug/kg | 230,000 | 680,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,1,1-Trichloroethane | ug/kg | 640,000 | 640,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,1,2,2-Tetrachloroethane | ug/kg | 71,000 | 670,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,1,2-Trichloroethane | ug/kg | 130,000 | 1,200,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,1-Dichloroethane | ug/kg | 390,000 | 1,700,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,1-Dichloroethene | ug/kg | 1,200,000 | 360,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,1-Dichloropropene | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,2,4-Trichlorobenzene, VOC | ug/kg | 400,000 | 400,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,2,4-Trimethylbenzene | ug/kg | 220,000 | 220,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,2-Dichlorobenzene, VOC | ug/kg | 380,000 | 380,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,2-Dichloroethane | ug/kg | 52,000 | 480,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,2-Dichloropropane | ug/kg | 170,000 | 180,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,3,5-Trimethylbenzene | ug/kg | 180,000 | 180,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,3-Dichlorobenzene, VOC | ug/kg | NC | NC | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,3-Dichloropropane | ug/kg | 1,500,000 | 1,500,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 1,4-Dichlorobenzene, VOC | ug/kg | 290,000 | 2,600,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 2,2-Dichloropropane | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 2-Butanone | ug/kg | 28,000,000 | 28,000,000 | 20 U | NS | 20 U | NS | 20 U | NS | 58.3 U | 79.3 U | 62.2 U | 73.7 U | 62.3 U | 54.6 U |
| 2-Chlorotoluene | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 2-Hexanone | ug/kg | NC | NC | 20 U | NS | 20 U | NS | 20 U | NS | 58.3 U | 79.3 U | 62.2 U | 73.7 U | 62.3 U | 54.6 U |
| 4-Chlorotoluene | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| 4-Methyl-2-Pentanone | ug/kg | 3,400,000 | 3,400,000 | 20 U | NS | 20 U | NS | 20 U | NS | 58.3 U | 79.3 U | 62.2 U | 73.7 U | 62.3 U | 54.6 U |
| Acetone | ug/kg | 110,000,000 | 110,000,000 | 50 U | NS | 50 U | NS | 50 U | NS | 117 U | 159 U | 124 U | 147 U | 125 U | 109 U |
| Benzene | ug/kg | 130,000 | 1,200,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Bromobenzene | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Bromodichloromethane | ug/kg | 33,000 | 300,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Bromoform | ug/kg | 910,000 | 910,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Bromomethane | ug/kg | 76,000 | 550,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 11.7 U | 15.9 U | 12.4 U | 14.7 U | 12.5 U | 10.9 U |
| Carbon disulfide | ug/kg | 740,000 | 740,000 | 20 U | NS | 20 U | NS | 20 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Carbon tetrachloride | ug/kg | 74,000 | 460,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Chlorobenzene | ug/kg | 760,000 | 760,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Chloroethane | ug/kg | 2,100,000 | 2,100,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 11.7 U | 15.9 U | 12.4 U | 14.7 U | 12.5 U | 10.9 U |
| Chloroform | ug/kg | 35,000 | 320,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Chloromethane | ug/kg | 1,200,000 | 1,300,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 11.7 U | 15.9 U | 12.4 U | 14.7 U | 12.5 U | 10.9 U |
| cis-1,2-Dichloroethene | ug/kg | 2,400,000 | 2,400,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| cis-1,3-Dichloropropene | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Dibromochloromethane | ug/kg | 800,000 | 800,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Dibromomethane | ug/kg | 250,000 | 870,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Dichlorodifluoromethane | ug/kg | 850,000 | 850,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Ethylbenzene | ug/kg | 480,000 | 480,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Hexachlorobutadiene, VOC | ug/kg | 17,000 | 270,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Isopropylbenzene, VOC | ug/kg | 270,000 | 270,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Methyl tert butyl ether | ug/kg | 5,400,000 | 8,900,000 | 10 U | NS | 10 U | NS | 10 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Methylene chloride | ug/kg | 3,300,000 | 3,300,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 58.3 U | 79.3 U | 62.2 U | 73.7 U | 62.3 U | 54.6 U |
| n-Butylbenzene | ug/kg | 110,000 | 110,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| n-Hexane | ug/kg | 140,000 | 140,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 23.3 U | 31.7 U | 24.9 U | 29.5 U | 24.9 U | 21.8 U |
| n-Propylbenzene | ug/kg | 260,000 | 260,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| p-Isopropyltoluene | ug/kg | 160,000 | 160,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| sec-Butylbenzene | ug/kg | 140,000 | 140,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Styrene | ug/kg | 870,000 | 870,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| tert-Butylbenzene | ug/kg | 180,000 | 180,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Tetrachloroethene | ug/kg | 170,000 | 170,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | **32.5** | 6.23 U | **26** |
| Toluene | ug/kg | 820,000 | 820,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| trans-1,2-Dichloroethene | ug/kg | 1,900,000 | 1,900,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| trans-1,3-Dichloropropene | ug/kg | NC | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Trichloroethene | ug/kg | 48,000 | 17,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | **12.4** | 6.23 U | **16.7** |
| Trichlorofluoromethane | ug/kg | 1,200,000 | 1,200,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Vinyl acetate | ug/kg | 2,700,000 | 620,000 | 10 U | NS | 10 U | NS | 10 U | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| Vinyl chloride | ug/kg | 49,000 | 280,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 2.33 U | 3.17 U | 2.49 U | 2.95 U | 2.49 U | 2.18 U |
| Xylene (Total) | ug/kg | 260,000 | 260,000 | NS | NS | NS | NS | NS | NS | 5.83 U | 7.93 U | 6.22 U | 7.37 U | 6.23 U | 5.46 U |
| **SVOCs** | | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene, SVOC | ug/kg | 400,000 | 400,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 1,2-Dichlorobenzene, SVOC | ug/kg | 380,000 | 380,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 1,3-Dichlorobenzene, SVOC | ug/kg | NC | NC | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 1,4-Dichlorobenzene, SVOC | ug/kg | 290,000 | 2,600,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,2-oxybis(2-Chloropropane | ug/kg | NC | NC | NS | NS | NS | NS | NS | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,4,5-Trichlorophenol | ug/kg | 250,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,4,6-Trichlorophenol | ug/kg | 2,500,000 | 1,600,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,4-Dichlorophenol | ug/kg | 7,600,000 | 32,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,4-Dimethylphenol | ug/kg | 51,000,000 | 95,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,4-Dinitrotoluene | ug/kg | 230,000 | 3,600,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2,6-Dinitrotoluene | ug/kg | 47,000 | 750,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2-Chloronaphthalene | ug/kg | 370,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2-Chlorophenol | ug/kg | 23,000,000 | 27,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2-Methylnaphthalene | ug/kg | 8,900,000 | 5,800,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| 2-Methylphenol | ug/kg | 130,000,000 | 790,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 2-Nitrophenol | ug/kg | NC | NC | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 4,6-Dinitro-2-methylphenol | ug/kg | 200,000 | 1,300,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 4-Bromophenyl phenyl ether | ug/kg | NC | NC | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 4-Chloro-3-methylphenol | ug/kg | 250,000,000 | 160,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 4-Chloroaniline | ug/kg | 350,000 | 800,000 | NS | NS | NS | NS | NS | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| 4-Methylphenol | ug/kg | 250,000,000 | 32,000,000 | NS | NS | NS | NS | NS | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Acenaphthene | ug/kg | 1,000,000,000 | 290,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| Acenaphthylene | ug/kg | 130,000,000 | 290,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| Anthracene | ug/kg | 670,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| Benzo(a)anthracene | ug/kg | 610,000 | 9,600,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | **970** | NS | 365 U | NS |
| Benzo(a)pyrene | ug/kg | 62,000 | 230,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | **469** | NS | **1150** | NS | **229** | NS |
| Benzo(b)fluoranthene | ug/kg | 620,000 | 10,000,000 | 0.10 U | NS | 0.10 U | NS | **1.40** | NS | **456** | NS | **1070** | NS | 365 U | NS |
| Benzo(g,h,i)perylene | ug/kg | 67,000,000 | 430,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | **567** | NS | 365 U | NS |
| Benzo(k)fluoranthene | ug/kg | 6,200,000 | 100,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | **477** | NS | 365 U | NS |
| Benzoic acid | ug/kg | 1,000,000,000 | 1,000,000,000 | NS | NS | NS | NS | NS | NS | 3520 U | NS | 3680 U | NS | 3650 U | NS |
| Benzyl alcohol | ug/kg | NC | NC | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Benzyl butyl phthalate | ug/kg | 37,000,000 | 590,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| bis(2-Chloroethoxy)methane | ug/kg | 7,600,000 | 48,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| bis(2-Chloroethyl)ether | ug/kg | 30,000 | 290,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| bis(2-Ethylhexyl)phthalate | ug/kg | 5,100,000 | 79,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Chrysene | ug/kg | 62,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | **1.31** | NS | 352 U | NS | **837** | NS | 365 U | NS |
| Dibenz(a,h)anthracene | ug/kg | 62,000 | 1,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 176 U | NS | **349** | NS | 182 U | NS |
| Dibenzofuran | ug/kg | 4,700,000 | 9,700,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Diethyl phthalate | ug/kg | 1,000,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Dimethyl phthalate | ug/kg | 1,000,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Di-N-Octyl phthalate | ug/kg | 25,000,000 | 160,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Fluoranthene | ug/kg | 89,000,000 | 170,000,000 | 0.10 U | NS | 0.10 U | NS | **3.30** | NS | **455** | NS | **1120** | NS | 365 U | NS |
| Fluorene | ug/kg | 89,000,000 | 580,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| Hexachlorobenzene | ug/kg | 22,000 | 16,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| Hexachlorobutadiene, SVOC | ug/kg | 17,000 | 17,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | NA | NS | NA | NS | NA | NS |
| Hexachlorocyclopentadiene | ug/kg | 16,000 | 16,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 1410 U | NS | 1470 U | NS | 1460 U | NS |
| Hexachloroethane | ug/kg | 210,000 | 2,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Indeno(1,2,3-cd)pyrene | ug/kg | 620,000 | 10,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | **600** | NS | 365 U | NS |
| Isophorone | ug/kg | 75,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Naphthalene, SVOC | ug/kg | 420,000 | 560,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | 368 U | NS | 365 U | NS |
| Nitrobenzene | ug/kg | 560,000 | 3,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| N-Nitrosodi-n-propylamine | ug/kg | 10,000 | 160,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Pentachlorophenol | ug/kg | 100,000 | 1,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Phenanthrene | ug/kg | 670,000,000 | 1,000,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 352 U | NS | **538** | NS | 365 U | NS |
| Phenol | ug/kg | 760,000,000 | 940,000,000 | 0.10 U | NS | 0.10 U | NS | 0.10 U | NS | 704 U | NS | 735 U | NS | 729 U | NS |
| Pyrene, SVOC | ug/kg | 67,000,000 | 430,000,000 | 0.10 U | NS | 0.10 U | NS | **2.67** | NS | **457** | NS | **1160** | NS | 365 U | NS |
| **PCBs** | | | | | | | | | | | | | | | |
| Aroclor-1016 | mg/kg | 150 | 290 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | 0.04 U | NS | 0.041 U | NS | 0.041 U | NS |
| Aroclor-1221 | mg/kg | 22 | 300 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | 0.04 U | NS | 0.041 U | NS | 0.041 U | NS |
| Aroclor-1232 | mg/kg | 18 | 230 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | 0.04 U | NS | 0.041 U | NS | 0.041 U | NS |
| Aroclor-1242 | mg/kg | 27 | 400 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | 0.04 U | NS | 0.041 U | NS | 0.041 U | NS |
| Aroclor-1248 | mg/kg | 26 | 390 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | 0.04 U | NS | 0.041 U | NS | 0.041 U | NS |
| Aroclor-1254 | mg/kg | 28 | 84 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | **0.082** | NS | 0.041 U | NS | 0.041 U | NS |
| Aroclor-1260 | mg/kg | 28 | 450 | NS | 0.0211 U | NS | 0.0226 U | NS | 0.0218 U | 0.04 U | NS | 0.041 U | NS | 0.041 U | NS |
| **Metals** | | | | | | | | | | | | | | | |
| Antimony | mg/kg | 1,900 | 970 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 38.5 UM,RL3 | NS | 20.2 U | NS | 40.7 URL3 | NS |
| Arsenic | mg/kg | 100 | 760 | **4.49** | NS | **3.49** | NS | **5.51** | NS | **8.81 RL3** | NS | **6.71** | NS | 8.15 URL3 | NS |
| Beryllium | mg/kg | 8,800 | 3,500 | 0.50 U | NS | 0.50 U | NS | 0.50 U | NS | 1.93 URL3 | NS | 1.02 U | NS | 2.04 URL3 | NS |
| Cadmium | mg/kg | 3,300 | 710 | 1.0 U | NS | 1.0 U | NS | 1.0 U | NS | 11.5 URL3 | NS | 6.08 U | NS | 12.2 URL3 | NS |
| Chromium Total | mg/kg | NC` | NC | **5.59** | NS | **5.73** | NS | **6.24** | NS | 15.4 URL3 | NS | **8.59** | NS | 16.2 URL3 | NS |
| Copper | mg/kg | 190,000 | 24,000 | **18.9** | NS | **21.7** | NS | **28.6** | NS | **176 M** | NS | **23** | NS | **12.8** | NS |
| Lead | mg/kg | 800 | 400 | **34.7** | NS | **32.2** | NS | **54.8** | NS | **41 M** | NS | **36.1** | NS | 32.5 URL3 | NS |
| Mercury | mg/kg | 3.1 | 3.1 | 0.10 U | NS | **0.15** | NS | **0.222** | NS | **0.342 M** | NS | **0.485** | NS | **0.31** | NS |
| Nickel | mg/kg | 83,000 | 24,000 | **6.85** | NS | **6.25** | NS | **7.78** | NS | **10.3** | NS | **12.1** | NS | **7.44** | NS |
| Selenium | mg/kg | 23,000 | 12,000 | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 38.5 URL3 | NS | 20.2 U | NS | 40.7 URL3 | NS |
| Silver | mg/kg | 23,000 | 12,000 | 1.0 U | NS | 1.0 U | NS | 1.0 U | NS | 15.4 URL3 | NS | 8.09 U | NS | 16.2 URL3 | NS |
| Thallium | mg/kg | NC` | NC | 5.0 U | NS | 5.0 U | NS | 5.0 U | NS | 11.5 URL3 | NS | 6.08 U | NS | 12.2 URL3 | NS |
| Zinc | mg/kg | 1,000,000 | 730,000 | **51.2** | NS | **52.9** | NS | **91.2** | NS | **58.8** | NS | **59** | NS | **44.1** | NS |
| **TPH** | | | | | | | | | | | | | | | |
| DRO (C10-C20) | ug/kg | NC | NC | NS | NS | NS | NS | NS | NS | 100000 UH | NS | 100000 UH | NS | 100000 UH | NS |
| DRO (C20-C34) | ug/kg | NC | NC | NS | NS | NS | NS | NS | NS | 100000 UH | NS | **113000 H** | NS | 100000 UH | NS |

**Notes:**
**Parameters with detections are bolded**
Data for imported Farm Soil used in the berm were not available to include in the table, but were evaluated in 2009 and determined to meet C/I GDCSS.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
H = Analyzed outside of method holding time
J = Result is estimated
M = Matrix spike and/or matrix spike duplicate recovery outside acceptance limits
NC= No criteria
NA = Not available
NS = Not sampled for this analysis
PCBs = Polychlorinated biphenyls
RL1 = Reporting limit raised due to sample matrix effects
RL3 = Reporting limit raised due to high concentrations of non-target analytes
R-05 = The sample was diluted due to the presence of high levels of non-target analytes resulting in elevated reporting limits
SVOCs = Semi-volatile organic compounds
U = Not detected at or above the reporting limit identified
VOCs = Volatile organic compounds

**Analyte concentration exceeds the criteria for:**
**2019 Commercial/Industrial Generic Direct Contact Soil Standard for a Single Chemical (C/I GDCSS)**
**2019 Construction Worker Generic Direct Contact Soil Standard for a Single Chemical (Const. GDCSS)**

**TABLE 1.1**
**SUMMARY OF ANALYTICAL RESULTS FOR SOIL PLACED IN EXISTING BERM**
**NORTHERN PORTION OF TECH TOWN PROPERTY**
**DAYTON, OHIO**

| FieldSampleID | Reporting Units | C/I GDCSS | Const. GDCSS | TT-TSSP-04-C | TT-TSSP-04-G | TT-TSSP-05-C | TT-TSSP-05-G | TT-TSSP-06-C | TT-TSSP-06-G | TT-TSSP-07-C | TT-TSSP-07-G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | | | | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 | 3/18/2011 |
| **VOCs** | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ug/kg | 230,000 | 680,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,1,1-Trichloroethane | ug/kg | 640,000 | 640,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,1,2,2-Tetrachloroethane | ug/kg | 71,000 | 670,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,1,2-Trichloroethane | ug/kg | 130,000 | 1,200,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,1-Dichloroethane | ug/kg | 390,000 | 1,700,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,1-Dichloroethene | ug/kg | 1,200,000 | 360,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,1-Dichloropropene | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,2,4-Trichlorobenzene, VOC | ug/kg | 400,000 | 400,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,2,4-Trimethylbenzene | ug/kg | 220,000 | 220,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,2-Dichlorobenzene, VOC | ug/kg | 380,000 | 380,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,2-Dichloroethane | ug/kg | 52,000 | 480,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,2-Dichloropropane | ug/kg | 170,000 | 180,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,3,5-Trimethylbenzene | ug/kg | 180,000 | 180,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,3-Dichlorobenzene, VOC | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,3-Dichloropropane | ug/kg | 1,500,000 | 1,500,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 1,4-Dichlorobenzene, VOC | ug/kg | 290,000 | 2,600,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 2,2-Dichloropropane | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 2-Butanone | ug/kg | 28,000,000 | 28,000,000 | 57.8 U | 52.8 U | 59.4 U | 54.8 U | 57.7 U | 53.7 U | 54.3 U | 62.9 U |
| 2-Chlorotoluene | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 2-Hexanone | ug/kg | NC | NC | 57.8 U | 52.8 U | 59.4 U | 54.8 U | 57.7 U | 53.7 U | 54.3 U | 62.9 U |
| 4-Chlorotoluene | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| 4-Methyl-2-Pentanone | ug/kg | 3,400,000 | 3,400,000 | 57.8 U | 52.8 U | 59.4 U | 54.8 U | 57.7 U | 53.7 U | 54.3 U | 62.9 U |
| Acetone | ug/kg | 110,000,000 | 110,000,000 | 116 U | 106 U | 119 U | 110 U | 115 U | 107 U | 109 U | 126 U |
| Benzene | ug/kg | 130,000 | 1,200,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Bromobenzene | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Bromodichloromethane | ug/kg | 33,000 | 300,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Bromoform | ug/kg | 910,000 | 910,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Bromomethane | ug/kg | 76,000 | 550,000 | 11.6 U | 10.6 U | 11.9 U | 11 U | 11.5 U | 10.7 U | 10.9 U | 12.6 U |
| Carbon disulfide | ug/kg | 740,000 | 740,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Carbon tetrachloride | ug/kg | 74,000 | 460,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Chlorobenzene | ug/kg | 760,000 | 760,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Chloroethane | ug/kg | 2,100,000 | 2,100,000 | 11.6 U | 10.6 U | 11.9 U | 11 U | 11.5 U | 10.7 U | 10.9 U | 12.6 U |
| Chloroform | ug/kg | 35,000 | 320,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Chloromethane | ug/kg | 1,200,000 | 1,300,000 | 11.6 U | 10.6 U | 11.9 U | 11 U | 11.5 U | 10.7 U | 10.9 U | 12.6 U |
| cis-1,2-Dichloroethene | ug/kg | 2,400,000 | 2,400,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| cis-1,3-Dichloropropene | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Dibromochloromethane | ug/kg | 800,000 | 800,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Dibromomethane | ug/kg | 250,000 | 870,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Dichlorodifluoromethane | ug/kg | 850,000 | 850,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Ethylbenzene | ug/kg | 480,000 | 480,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Hexachlorobutadiene, VOC | ug/kg | 17,000 | 17,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Isopropylbenzene, VOC | ug/kg | 270,000 | 270,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Methyl tert butyl ether | ug/kg | 5,400,000 | 8,900,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Methylene chloride | ug/kg | 3,300,000 | 3,300,000 | 57.8 U | 52.8 U | 59.4 U | 54.8 U | 57.7 U | 53.7 U | 54.3 U | 62.9 U |
| n-Butylbenzene | ug/kg | 110,000 | 110,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| n-Hexane | ug/kg | 140,000 | 140,000 | 23.1 U | 21.1 U | 23.8 U | 21.9 U | 23.1 U | 21.5 U | 21.7 U | 25.2 U |
| n-Propylbenzene | ug/kg | 260,000 | 260,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| p-Isopropyltoluene | ug/kg | 160,000 | 160,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| sec-Butylbenzene | ug/kg | 140,000 | 140,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Styrene | ug/kg | 870,000 | 870,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| tert-Butylbenzene | ug/kg | 180,000 | 180,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Tetrachloroethene | ug/kg | 170,000 | 170,000 | 5.78 U | **12.6** | 5.94 U | **41.8** | 5.77 U | **44.7** | 5.43 U | 6.29 U |
| Toluene | ug/kg | 820,000 | 820,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| trans-1,2-Dichloroethene | ug/kg | 1,900,000 | 1,900,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| trans-1,3-Dichloropropene | ug/kg | NC | NC | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Trichloroethene | ug/kg | 48,000 | 17,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | **36.2** | 5.43 U | 6.29 U |
| Trichlorofluoromethane | ug/kg | 1,200,000 | 1,200,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Vinyl acetate | ug/kg | 2,700,000 | 620,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| Vinyl chloride | ug/kg | 49,000 | 280,000 | 2.31 U | 2.11 U | 2.38 U | 2.19 U | 2.31 U | 2.15 U | 2.17 U | 2.52 U |
| Xylene (Total) | ug/kg | 260,000 | 260,000 | 5.78 U | 5.28 U | 5.94 U | 5.48 U | 5.77 U | 5.37 U | 5.43 U | 6.29 U |
| **SVOCs** | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene, SVOC | ug/kg | 400,000 | 400,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 1,2-Dichlorobenzene, SVOC | ug/kg | 380,000 | 380,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 1,3-Dichlorobenzene, SVOC | ug/kg | NC | NC | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 1,4-Dichlorobenzene, SVOC | ug/kg | 290,000 | 2,600,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,2-oxybis(2-Chloropropane | ug/kg | NC | NC | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,4,5-Trichlorophenol | ug/kg | 250,000,000 | 1,000,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,4,6-Trichlorophenol | ug/kg | 2,500,000 | 1,600,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,4-Dichlorophenol | ug/kg | 7,600,000 | 32,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,4-Dimethylphenol | ug/kg | 51,000,000 | 95,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,4-Dinitrotoluene | ug/kg | 230,000 | 3,600,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2,6-Dinitrotoluene | ug/kg | 47,000 | 750,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2-Chloronaphthalene | ug/kg | 370,000,000 | 1,000,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2-Chlorophenol | ug/kg | 23,000,000 | 27,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2-Methylnaphthalene | ug/kg | 8,900,000 | 5,800,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| 2-Methylphenol | ug/kg | 130,000,000 | 790,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 2-Nitrophenol | ug/kg | NC | NC | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 4,6-Dinitro-2-methylphenol | ug/kg | 200,000 | 1,300,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 4-Bromophenyl phenyl ether | ug/kg | NC | NC | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 4-Chloro-3-methylphenol | ug/kg | 250,000,000 | 160,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 4-Chloroaniline | ug/kg | 350,000 | 800,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| 4-Methylphenol | ug/kg | 250,000,000 | 32,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Acenaphthene | ug/kg | 1,000,000,000 | 290,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Acenaphthylene | ug/kg | 130,000,000 | 290,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Anthracene | ug/kg | 670,000,000 | 1,000,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Benzo(a)anthracene | ug/kg | 610,000 | 9,600,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Benzo(a)pyrene | ug/kg | 62,000 | 230,000 | 1720 URL1 | NS | **288** | NS | **264** | NS | **266** | NS |
| Benzo(b)fluoranthene | ug/kg | 620,000 | 10,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Benzo(g,h,i)perylene | ug/kg | 67,000,000 | 430,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Benzo(k)fluoranthene | ug/kg | 6,200,000 | 100,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Benzoic acid | ug/kg | 1,000,000,000 | 1,000,000,000 | 34300 URL1 | NS | 3590 U | NS | 3500 U | NS | 3250 U | NS |
| Benzyl alcohol | ug/kg | NC | NC | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Benzyl butyl phthalate | ug/kg | 37,000,000 | 590,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| bis(2-Chloroethoxy)methane | ug/kg | 7,600,000 | 48,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| bis(2-Chloroethyl)ether | ug/kg | 30,000 | 290,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| bis(2-Ethylhexyl)phthalate | ug/kg | 5,100,000 | 79,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Chrysene | ug/kg | 62,000,000 | 1,000,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Dibenz(a,h)anthracene | ug/kg | 62,000 | 1,000,000 | 1720 URL1 | NS | 180 U | NS | 175 U | NS | 162 U | NS |
| Dibenzofuran | ug/kg | 4,700,000 | 9,700,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Diethyl phthalate | ug/kg | 1,000,000,000 | 1,000,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Dimethyl phthalate | ug/kg | 1,000,000,000 | 1,000,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Di-N-Octyl phthalate | ug/kg | 25,000,000 | 160,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Fluoranthene | ug/kg | 89,000,000 | 170,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | **432** | NS |
| Fluorene | ug/kg | 89,000,000 | 580,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Hexachlorobenzene | ug/kg | 22,000 | 16,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Hexachlorobutadiene, SVOC | ug/kg | 17,000 | 17,000 | NA | NS | NA | NS | NA | NS | NA | NS |
| Hexachlorocyclopentadiene | ug/kg | 16,000 | 16,000 | 13700 URL1 | NS | 1440 U | NS | 1400 U | NS | 1300 U | NS |
| Hexachloroethane | ug/kg | 210,000 | 2,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Indeno(1,2,3-cd)pyrene | ug/kg | 620,000 | 10,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Isophorone | ug/kg | 75,000,000 | 1,000,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Naphthalene, SVOC | ug/kg | 420,000 | 560,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Nitrobenzene | ug/kg | 560,000 | 3,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| N-Nitrosodi-n-propylamine | ug/kg | 10,000 | 160,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Pentachlorophenol | ug/kg | 100,000 | 1,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Phenanthrene | ug/kg | 670,000,000 | 1,000,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | 325 U | NS |
| Phenol | ug/kg | 760,000,000 | 940,000,000 | 6860 URL1 | NS | 719 U | NS | 701 U | NS | 650 U | NS |
| Pyrene, SVOC | ug/kg | 67,000,000 | 430,000,000 | 3430 URL1 | NS | 359 U | NS | 350 U | NS | **417** | NS |
| **PCBs** | | | | | | | | | | | |
| Aroclor-1016 | mg/kg | 150 | 290 | 0.04 U | NS | 0.041 U | NS | 0.038 U | NS | 0.04 U | NS |
| Aroclor-1221 | mg/kg | 22 | 300 | 0.04 U | NS | 0.041 U | NS | 0.038 U | NS | 0.04 U | NS |
| Aroclor-1232 | mg/kg | 18 | 230 | 0.04 U | NS | 0.041 U | NS | 0.038 U | NS | 0.04 U | NS |
| Aroclor-1242 | mg/kg | 27 | 400 | 0.04 U | NS | 0.041 U | NS | **0.046** | NS | 0.04 U | NS |
| Aroclor-1248 | mg/kg | 26 | 390 | 0.04 U | NS | 0.041 U | NS | 0.038 U | NS | 0.04 U | NS |
| Aroclor-1254 | mg/kg | 28 | 84 | 0.04 U | NS | **0.065** | NS | **0.053** | NS | **0.15** | NS |
| Aroclor-1260 | mg/kg | 28 | 450 | 0.04 U | NS | 0.041 U | NS | 0.038 U | NS | 0.04 U | NS |
| **Metals** | | | | | | | | | | | |
| Antimony | mg/kg | 1,900 | 970 | 19 U | NS | 39 URL3 | NS | 38.4 URL3 | NS | 18.1 U | NS |
| Arsenic | mg/kg | 100 | 760 | **4.79** | NS | 7.82 URL3 | NS | 7.7 URL3 | NS | **7.27** | NS |
| Beryllium | mg/kg | 8,800 | 3,500 | 0.952 U | NS | 1.96 URL3 | NS | 1.93 URL3 | NS | 0.906 U | NS |
| Cadmium | mg/kg | 3,300 | 710 | 5.7 U | NS | 11.7 URL3 | NS | 11.5 URL3 | NS | 5.43 U | NS |
| Chromium Total | mg/kg | NC` | NC | 7.58 U | NS | 15.6 URL3 | NS | 15.3 URL3 | NS | **8.32** | NS |
| Copper | mg/kg | 190,000 | 24,000 | **16.4** | NS | **23.1** | NS | **16.9** | NS | **20.7** | NS |
| Lead | mg/kg | 800 | 400 | **19.8** | NS | **47.7** | NS | 30.7 URL3 | NS | **21.8** | NS |
| Mercury | mg/kg | 3.1 | 3.1 | **0.14** | NS | **0.296** | NS | **0.192** | NS | **0.422** | NS |
| Nickel | mg/kg | 83,000 | 24,000 | **7.35** | NS | **8.6** | NS | **6.57** | NS | **11.7** | NS |
| Selenium | mg/kg | 23,000 | 12,000 | 19 U | NS | 39 URL3 | NS | 38.4 URL3 | NS | 18.1 U | NS |
| Silver | mg/kg | 23,000 | 12,000 | 7.58 U | NS | 15.6 URL3 | NS | 15.3 URL3 | NS | 7.22 U | NS |
| Thallium | mg/kg | NC` | NC | 5.7 U | NS | 11.7 URL3 | NS | 11.5 URL3 | NS | 5.43 U | NS |
| Zinc | mg/kg | 1,000,000 | 730,000 | **48.5** | NS | **124** | NS | **34.9** | NS | **72.7** | NS |
| **TPH** | | | | | | | | | | | |
| DRO (C10-C20) | ug/kg | NC | NC | 100000 UH | NS | 100000 UH | NS | 100000 UH | NS | 100000 UH | NS |
| DRO (C20-C34) | ug/kg | NC | NC | 100000 UH | NS | 100000 UH | NS | 100000 UH | NS | 100000 UH | NS |

**Notes:**
**Parameters with detections are bolded**
Data for imported Farm Soil used in the berm were not available to include in the table, but were evaluated in 2009 and determined to meet C/I GDCSS.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
H = Analyzed outside of method holding time
J = Result is estimated
M = Matrix spike and/or matrix spike duplicate recovery outside acceptance limits
NC= No criteria
NA = Not available
NS = Not sampled for this analysis
PCBs = Polychlorinated biphenyls
RL1 = Reporting limit raised due to sample matrix effects
RL3 = Reporting limit raised due to high concentrations of non-target analytes
R-05 = The sample was diluted due to the presence of high levels of non-target analytes resulting in elevated reporting limits
SVOCs = Semi-volatile organic compounds
U = Not detected at or above the reporting limit identified
VOCs = Volatile organic compounds

**Analyte concentration exceeds the criteria for:**
**2019 Commercial/Industrial Generic Direct Contact Soil Standard for a Single Chemical (C/I GDCSS)**
**2019 Construction Worker Generic Direct Contact Soil Standard for a Single Chemical (Const. GDCSS)**

**TABLE 2.1**
**SUMMARY OF IDENTIFIED AREAS AND AREAS OF INTEREST**
**NORTHERN TECH TOWN PROPERTY BOUNDARY**
**DAYTON, OHIO**

| GM AOI | Corresponding Identified Area | Location | Description | COCs |
|---|---|---|---|---|
| AOI 3: Waste Tank (N. Bldg. 4) | IA 3W/6N/16: Building 4 Tank Area: Location of USTs, ASTs, a spill interceptor, and waste tank sump located north, east, and west of Building 4 | North/Northwest of Former Building 4 | This AOI was the former location of a 1,000 gallon waste tank (UST) used to store scrap oil, solvents, and scrap kerosene. A release occurred from this UST in 1971 which entered a storm sewer. Oil and solvents were also removed from the ground surface. This tank was removed in approximately 1978. | Petroleum products and solvents. |
| AOI 6: Spill Interceptor tank (N. Bldg. 4) | | North of former Building 4 | This AOI is the location of a 10,000 gallon (UST) spill interceptor tank that was cleaned and inspected in 1998. The interceptor was designed to receive any waste or product spilled in the Building 4 Tank Area. RCRA closure of the tank was approved by OEPA in 2002. Closure included cleaning the tank and filling with lean concrete. | Petroleum products and solvents. |
| AOI 16: Fuel USTs | | Northwest of Former Building 4 | This AOI is the former location of three USTs that were used to store fuel and were installed in approximately 1974. The AOI included a 10,000 gallon unleaded gasoline UST that was removed in 1992, a 5,500 gallon regular gasoline/diesel fuel UST that was removed in 1992, and a 2,000 gallon diesel fuel UST that was removed in 1989. A release was reported for the 2,000 gallon UST in 1989, but an NFA letter was received from BUSTR in 1993. A release was also reported for the 10,000 gallon UST and the 5,500 gallon UST. Several ASTs storing gasoline and diesel fuel were also used in this area. | Petroleum Products |
| AOI 3: Waste Tank (E. Bldg. 4) | IA 3E/5W/21/33: hydromation pit, tanks, electroplating, and product storage area | East of Former Building 4 | This AOI was the former location of a 2,000 gallon waste tank (AST) and sump used to store waste oil and solvents. RCRA closure of this AST and sump was approved by OEPA in 2002. Closure included cleaning the sump and filling with lean concrete. | Petroleum products and chlorinated solvents. |
| AOI 33: Paint and Enamel Storage | | North end of Former Building 7 | This AOI is the former location of a paint and enamel storage area that was reportedly located outside at the north end of building 7. This area was identified on the 1943 insurance map. | Metals, petroleum products, VOCs |
| AOI 5: Electroplating (Bldg. 7) | | Former Building 7 | This AOI is the location of former plating operations located in the northwestern portion of Former Building 7. The plating operations consisted of multiple electroplating lines that used tanks and trenches. Wastes initially were discharged to the POTW and later in 1980 discharged to the WWTP. | Metals (including Zn, Cd, Cu, Sn, Cr), cyanide, VOCs |

**TABLE 2.1**
**SUMMARY OF IDENTIFIED AREAS AND AREAS OF INTEREST**
**NORTHERN TECH TOWN PROPERTY BOUNDARY**
**DAYTON, OHIO**

| GM AOI | Corresponding Identified Area | Location | Description | COCs |
|---|---|---|---|---|
| AOI 21: Hydromation Pit | | Beneath former Building 7 | This AOI is the location of a concrete pit used to re-circulate non-hazardous oil. The pit is located within an integral basement area to Building 7. The depth of the pit is reported to be between 10 to 14 feet deep and was backfilled with miscellaneous fill materials. LNAPL was discovered in this area and was investigated and delineated. Sanborn maps also identify three 800-gallon storage tanks in pit in this area. | Petroleum Products, PCBs |
| AOI 5: Electroplating (Bldg. 7) | IA5C: Electroplating area | Former Building 7 | This AOI is the location of former plating operations located in the central-eastern portion of Former Building 7. | Metals (including Zn, Cd, Cu, Sn, Cr), cyanide, VOCs |
| AOI 5: Electroplating (Bldg. 9) | IA5E: Electroplating area | Former Building 9 | This AOI is the location of former plating operations located in the northwestern portion of Former Building 9. The plating operations consisted of multiple electroplating lines that used tanks and trenches. Wastes initially were discharged to the POTW and later in 1980 discharged to the WWTP. | Metals (including Zn, Cd, Cu, Sn, Cr), cyanide, VOCs |
| AOI 11: Chip handling areas | IA 11: Chip handling area | Former Building 9 | Oil reclamation was conducted in Building 9 beginning in 1986 and metal chips (aluminum, cast iron and steel) were loaded into trucks in the northeast corner of Building 10 for transportation off Site. | VOCs, SVOCs, Petroleum Products, PCBs, Metals |
| AOI 18: Storm Sewers | IA 18/19: Underground Sewers | Property - wide | In 1971, Delphi identified various connections allowing discharges of process wastewater to the storm sewers. These connections were eliminated in 1971. Non-contact cooling water, water from the basement dewatering sumps, and stormwater runoff were discharged by outfalls to the Mad River. Four of these outfalls were located on the Property. Storm sewer interceptors were installed upstream of the outfalls in 1977. Wooden sewers were identified along Amelia Street near Buildings 5 and 7. Various releases to storm sewers on the Property have been reported, including releases of PCE (1975), refrigerant oil (1975), rotofinish product (1990), process wastewater (1990), and oil (1993). GM conducted sewer cleaning and abandonment activities for the Property as an interim remedial measure in 2006. | Metals, VOCs, Petroleum products, cyanide, PCBs |

# TABLE 2.1
# SUMMARY OF IDENTIFIED AREAS AND AREAS OF INTEREST
# NORTHERN TECH TOWN PROPERTY BOUNDARY
# DAYTON, OHIO

| GM AOI | Corresponding Identified Area | Location | Description | COCs |
|---|---|---|---|---|
| AOI 19: Process Sewers | | Property - wide | Historically, sanitary and process sewers were combined and discharged to the City of Dayton POTW. In 1981, the GM WWTP began operation. Sanitary sewer lines were installed overhead, and sanitary and process wastes were segregated. Process sewer lines were divided into plating wastes (from adjacent Building 9) and general oily waste and routed to the WWTP for treatment prior to discharge to the POTW. Process sewers were cleaned as part of decommissioning activities. All process manholes, sewer pits, and sumps were filled with concrete. Stained soil was observed around a sewer line during the Meigs Street improvement project in the area of Amelia Street. The stained soil was stockpiled, sampled, and removed from the site. The sample contained 200 mg/kg of PCBs. | Metals, VOCs, Petroleum products, cyanide, PCBs |
| NA | IA GW: Groundwater with potential for impact to Property from off-Property sources | Property-wide | Several sites located upgradient of the Property had regulatory listings deemed to indicate the potential to impact the Property through groundwater migration. Multiple AOIs located on the former GM site but off the Property indicate the potential to have impacted the Property. Light non-aqueous phase liquid (LNAPL) has been identified in a monitoring well near the eastern boundary of the Property. The LNAPL originates in the former Chip Handling area (AOI 11), which is off the Site to the east. PCBs have been detected in samples from the Chip Handling LNAPL plume at concentrations up to 1,120 mg/kg. | Petroleum products, metals, VOCs, PCBs, |

**Notes:**

AOI = Area of interest
AST = Aboveground storage tank
BUSTR = Bureau of Underground Storage Tank Regulations
COCs = Chemicals of concern
EU = Exposure Unit
IA = Identified Area
GM = General Motors
mg/kg = Milligram per kilogram
NFA = No further action
PCB = Polychlorinated biphenyl
PCE = Tetrachloroethene
POTW = Publicly owned treatment works
RCRA = Resource Conservation and Recovery Act
SVOCs = Semivolatile organic compounds
UST = Underground storage tank
VOCs = Volatile organic compounds
WESTON = Weston Solutions, Inc.
WWTP = Wastewater treatment plant
NA = Not applicable

**Table 2.2**
**Summary of Groundwater Analytical Results - Outside of VAP Property, West of Webster, January 2015 - September 2019**

| Well ID | Sample Date | Parameter Name | Maximum Detected Concentration (All wells/all dates) | Voluntary Action Program Generic Numerical Standards | |
|---|---|---|---|---|---|
| | | | | GW GUPUS - MCL | GW GUPUS - Risk Derived |
| **Inorganics (mg/L)** | | | | | |
| HD-8 | 21-Sep-16 | Aluminum | 0.183 | | 20 (RSL) |
| HD-8 | 21-Sep-16 | Arsenic | 0.00657 | 0.01 | |
| HD-8 | 23-Mar-16 | Barium | 0.123 | 2 | |
| HD-8 | 21-Sep-16 | Cadmium | 0.00383* | 0.005 | |
| HD-8 | 23-Mar-16 | Copper | 0.00651 | 1.3 | |
| HD-8 | 21-Sep-16 | Iron | 0.766 | | 14 (RSL) |
| HD-8 | 21-Sep-16 | Lead | 0.00742 | 0.015 | |
| HD-8 | 21-Sep-16 | Manganese | 0.215 | | 0.43 |
| HD-8 | 21-Sep-16 | Silver | 0.00211 | | 0.094 |
| HD-8 | 22-Jun-16 | Zinc | 0.0363 | | 6 |
| **Organics (ug/L)** | | | | | |
| MW-18-04 | 15-Jun-17 | 1,1-Dichloroethene | **13.2** | 7 | |
| MW-76S-17 | 12-Sep-19 | Bromomethane | 1.5 | | 7.5 |
| MW-78-17 | 12-Sep-19 | Chloroethane | 4.4 | | 21000 |
| MW-48-05 | 22-Jun-16 | Chloroform | 18.2 | 80 (a) | |
| MW-57-07 | 15-Jun-17 | cis-1,2-Dichloroethene | **658** | 70 | |
| MW-18-04 | 29-Mar-18 | Dichlorodifluoromethane | 38.9 | | 3600 |
| DAY-05R | 05-Jan-15 | Tetrachloroethene | **171** | 5 | |
| MW-57-07 | 21-Sep-16 | trans-1,2-Dichloroethene | 44.6 | 100 | |
| MW-57-07 | 29-Mar-18 | Trichloroethene | **955.5 ** ** | 5 | |
| MW-17-04 | 15-Jun-17 | Vinyl chloride | **21** | 2 | |

**Notes:**

Shaded/Bolded values indicate concentration exceeds the Voluntary Action Program Generic Numerical Standard, Effective October 17, 2019

µg/L = micrograms per kilogram

mg/L = Milligrams per liter

U = Parameter not detected, reporting limit is presented

RSL - EPA November 2019 regional screening level for tap water.

* Most recent sample result (21 September 2016); duplicate result was non-detect (0.002 U mg/L); maximum result was 0.00961 mg/L on 22 June 2016; duplicate resut was non-detect (0.002 U mg/L).

(a) MCL is for Total Trihalomethaneshe. The trihalomethanes are chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

** average of duplicate results (901 ug/L and 1010 ug/L)

**Table 2.3**

**Off-Property Groundwater Analytical Results for Constituents of Potential Concern - West of Webster Street, January 2015 - March 2020**

| Well ID | Date | Chemical | Result (ug/L) | Aquifer Zone | Current Status |
|---|---|---|---|---|---|
| MW-18-04 | 15-Jun-17 | 1,1-Dichloroethene | 13.2 | Lower Aquifer | Active |
| MW-18-04 | 29-Mar-18 | 1,1-Dichloroethene | 12 | Lower Aquifer | Active |
| MW-57-07 | 15-Jun-17 | 1,1-Dichloroethene | 8.64 | Lower Aquifer | Active |
| MW-57-07 | 29-Mar-18 | 1,1-Dichloroethene | 10.2 | Lower Aquifer | Active |
| MW-57-07 | 31-Aug-18 | 1,1-Dichloroethene | 6.74 | Lower Aquifer | Active |
| MW-17-04 | 21-Sep-16 | cis-1,2-Dichloroethene | 27.4 | Lower Aquifer | Active |
| MW-17-04 | 15-Jun-17 | cis-1,2-Dichloroethene | 24.1 | Lower Aquifer | Active |
| MW-17-04 | 27-Mar-18 | cis-1,2-Dichloroethene | 85.4 | Lower Aquifer | Active |
| MW-18-04 | 15-Jun-17 | cis-1,2-Dichloroethene | 371 | Lower Aquifer | Active |
| MW-18-04 | 29-Mar-18 | cis-1,2-Dichloroethene | 327 | Lower Aquifer | Active |
| MW-43-05 | 14-Jun-17 | cis-1,2-Dichloroethene | 81.9 | Lower Aquifer | Active |
| MW-43-05 | 29-Mar-18 | cis-1,2-Dichloroethene | 153 | Lower Aquifer | Active |
| MW-57-07 | 21-Sep-16 | cis-1,2-Dichloroethene | 558 | Lower Aquifer | Active |
| MW-57-07 | 15-Jun-17 | cis-1,2-Dichloroethene | 658 | Lower Aquifer | Active |
| MW-57-07 | 29-Mar-18 | cis-1,2-Dichloroethene | 636 | Lower Aquifer | Active |
| MW-57-07 | 31-Aug-18 | cis-1,2-Dichloroethene | 570 | Lower Aquifer | Active |
| MW-18-04 | 15-Jun-17 | Trichloroethene | 14.4 | Lower Aquifer | Active |
| MW-18-04 | 29-Mar-18 | Trichloroethene | 46.2 | Lower Aquifer | Active |
| MW-43-05 | 14-Jun-17 | Trichloroethene | 9.81 | Lower Aquifer | Active |
| MW-43-05 | 29-Mar-18 | Trichloroethene | 15.8 | Lower Aquifer | Active |
| MW-57-07 | 21-Sep-16 | Trichloroethene | 568 | Lower Aquifer | Active |
| MW-57-07 | 15-Jun-17 | Trichloroethene | 550 | Lower Aquifer | Active |
| MW-57-07 | 29-Mar-18 | Trichloroethene | 955.5 | Lower Aquifer | Active |
| MW-57-07 | 31-Aug-18 | Trichloroethene | 555 | Lower Aquifer | Active |
| MW-17-04 | 21-Sep-16 | Vinyl chloride | 2.84 | Lower Aquifer | Active |
| MW-17-04 | 15-Jun-17 | Vinyl chloride | 2.31 | Lower Aquifer | Active |
| MW-17-04 | 27-Mar-18 | Vinyl chloride | 2.65 | Lower Aquifer | Active |
| MW-18-04 | 15-Jun-17 | Vinyl chloride | 21 | Lower Aquifer | Active |
| MW-18-04 | 29-Mar-18 | Vinyl chloride | 7.7 | Lower Aquifer | Active |
| MW-43-05 | 14-Jun-17 | Vinyl chloride | 5.68 | Lower Aquifer | Active |
| MW-43-05 | 29-Mar-18 | Vinyl chloride | 5.53 | Lower Aquifer | Active |
| MW-57-07 | 15-Jun-17 | Vinyl chloride | 3.34 | Lower Aquifer | Active |
| MW-57-07 | 29-Mar-18 | Vinyl chloride | 4.75 | Lower Aquifer | Active |
| MW-57-07 | 31-Aug-18 | Vinyl chloride | 1.99 | Lower Aquifer | Active |
| DAY-05R | 05-Jan-15 | cis-1,2-Dichloroethene | 27.1 | Upper Aquifer - Intermediate | In Active |
| DAY-06 | 28-Mar-18 | cis-1,2-Dichloroethene | 23.5 | Upper Aquifer - Intermediate | Active |
| DAY-11S | 05-Jan-15 | cis-1,2-Dichloroethene | 15.1 | Upper Aquifer - Intermediate | Abandoned |
| DAY-05R | 05-Jan-15 | Tetrachloroethene | 171 | Upper Aquifer - Intermediate | In Active |
| DAY-11S | 05-Jan-15 | Tetrachloroethene | 55.6 | Upper Aquifer - Intermediate | Abandoned |
| DAY-05R | 05-Jan-15 | Trichloroethene | 10.1 | Upper Aquifer - Intermediate | In Active |
| DAY-11S | 05-Jan-15 | Trichloroethene | 11.8 | Upper Aquifer - Intermediate | Abandoned |
| DAY-06 | 28-Mar-18 | Vinyl chloride | 13.4 | Upper Aquifer - Intermediate | Active |
| DAY-11D | 05-Jan-15 | cis-1,2-Dichloroethene | 10.1 | Upper Aquifer - Top of Till | Abandoned |
| DAY-12 | 06-Jan-15 | cis-1,2-Dichloroethene | 10.7 | Upper Aquifer - Top of Till | In Active |
| HD-19 | 05-Jan-15 | cis-1,2-Dichloroethene | 8.67 | Upper Aquifer - Top of Till | Abandoned |
| HD-9 | 28-Mar-18 | cis-1,2-Dichloroethene | 5.02 | Upper Aquifer - Top of Till | Active |
| HD-9 | 13-Dec-18 | cis-1,2-Dichloroethene | 7.2 | Upper Aquifer - Top of Till | Active |
| MW-6B-03 | 11-Dec-18 | cis-1,2-Dichloroethene | 19.8 | Upper Aquifer - Top of Till | In Active |
| MW-76D-17 | 09-Jan-18 | cis-1,2-Dichloroethene | 6.66 | Upper Aquifer - Top of Till | Active |
| MW-76D-17 | 26-Mar-18 | cis-1,2-Dichloroethene | 7.98 | Upper Aquifer - Top of Till | Active |
| MW-76D-17 | 11-Dec-18 | cis-1,2-Dichloroethene | 2.3 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 12-Mar-19 | cis-1,2-Dichloroethene | 1.9 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 17-Mar-20 | cis-1,2-Dichloroethene | 1.2 | Upper Aquifer - Top of Till | Active |

See notes on Page 4.

**Table 2.3**

**Off-Property Groundwater Analytical Results for Constituents of Potential Concern - West of Webster Street, January 2015 - March 2020**

| Well ID | Date | Chemical | Result (ug/L) | Aquifer Zone | Current Status |
|---|---|---|---|---|---|
| MW-7B-03 | 09-Jan-18 | cis-1,2-Dichloroethene | 24.1 | Upper Aquifer - Top of Till | Active |
| MW-7B-03 | 11-Dec-18 | cis-1,2-Dichloroethene | 32.1 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 12-Dec-18 | cis-1,2-Dichloroethene | 5.5 | Upper Aquifer - Top of Till | Active |
| DAY-08 | 28-Mar-18 | Tetrachloroethene | 5.68 | Upper Aquifer - Top of Till | Active |
| DAY-11D | 05-Jan-15 | Tetrachloroethene | 38.5 | Upper Aquifer - Top of Till | Abandoned |
| DAY-12 | 06-Jan-15 | Tetrachloroethene | 49.9 | Upper Aquifer - Top of Till | In Active |
| HD-11 | 06-Jan-15 | Tetrachloroethene | 42.1 | Upper Aquifer - Top of Till | Abandoned |
| HD-19 | 05-Jan-15 | Tetrachloroethene | 84.7 | Upper Aquifer - Top of Till | Abandoned |
| HD-3 | 28-Mar-18 | Tetrachloroethene | 14.6 | Upper Aquifer - Top of Till | Active |
| HD-3 | 12-Dec-18 | Tetrachloroethene | 20 | Upper Aquifer - Top of Till | Active |
| HD-4 | 28-Mar-18 | Tetrachloroethene | 27.4 | Upper Aquifer - Top of Till | Active |
| HD-8 | 23-Mar-16 | Tetrachloroethene | 14.4 | Upper Aquifer - Top of Till | Active |
| HD-8 | 21-Sep-16 | Tetrachloroethene | 27.5 | Upper Aquifer - Top of Till | Active |
| HD-8 | 05-Dec-17 | Tetrachloroethene | 10.3 | Upper Aquifer - Top of Till | Active |
| HD-8 | 28-Mar-18 | Tetrachloroethene | 12.6 | Upper Aquifer - Top of Till | Active |
| HD-8 | 12-Dec-18 | Tetrachloroethene | 11.1 | Upper Aquifer - Top of Till | Active |
| HD-9 | 05-Dec-17 | Tetrachloroethene | 18.4 | Upper Aquifer - Top of Till | Active |
| HD-9 | 28-Mar-18 | Tetrachloroethene | 16.6 | Upper Aquifer - Top of Till | Active |
| HD-9 | 13-Dec-18 | Tetrachloroethene | 18.4 | Upper Aquifer - Top of Till | Active |
| MW-6B-03 | 11-Dec-18 | Tetrachloroethene | 16.5 | Upper Aquifer - Top of Till | In Active |
| MW-76D-17 | 09-Jan-18 | Tetrachloroethene | 86.9 | Upper Aquifer - Top of Till | Active |
| MW-76D-17 | 26-Mar-18 | Tetrachloroethene | 147 | Upper Aquifer - Top of Till | Active |
| MW-76D-17 | 11-Dec-18 | Tetrachloroethene | 164 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 10-Jan-18 | Tetrachloroethene | 15.6 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 28-Mar-18 | Tetrachloroethene | 14.5 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 11-Dec-18 | Tetrachloroethene | 15.1 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 12-Mar-19 | Tetrachloroethene | 24 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 13-Sep-19 | Tetrachloroethene | 9.1 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 17-Mar-20 | Tetrachloroethene | 20.3 | Upper Aquifer - Top of Till | Active |
| MW-7B-03 | 11-Dec-18 | Tetrachloroethene | 1.3 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 09-Jan-18 | Tetrachloroethene | 10.5 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 27-Mar-18 | Tetrachloroethene | 9.68 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 12-Dec-18 | Tetrachloroethene | 5.6 | Upper Aquifer - Top of Till | Active |
| DAY-11D | 05-Jan-15 | Trichloroethene | 6.07 | Upper Aquifer - Top of Till | Abandoned |
| DAY-12 | 06-Jan-15 | Trichloroethene | 10.4 | Upper Aquifer - Top of Till | In Active |
| HD-11 | 06-Jan-15 | Trichloroethene | 9.66 | Upper Aquifer - Top of Till | Abandoned |
| HD-19 | 05-Jan-15 | Trichloroethene | 31.1 | Upper Aquifer - Top of Till | Abandoned |
| HD-3 | 28-Mar-18 | Trichloroethene | 6.11 | Upper Aquifer - Top of Till | Active |
| HD-3 | 12-Dec-18 | Trichloroethene | 7.3 | Upper Aquifer - Top of Till | Active |
| HD-4 | 28-Mar-18 | Trichloroethene | 22 | Upper Aquifer - Top of Till | Active |
| HD-8 | 23-Mar-16 | Trichloroethene | 9.51 | Upper Aquifer - Top of Till | Active |
| HD-8 | 21-Sep-16 | Trichloroethene | 9.66 | Upper Aquifer - Top of Till | Active |
| HD-8 | 05-Dec-17 | Trichloroethene | 6.18 | Upper Aquifer - Top of Till | Active |
| HD-8 | 28-Mar-18 | Trichloroethene | 7.08 | Upper Aquifer - Top of Till | Active |
| HD-8 | 12-Dec-18 | Trichloroethene | 6.2 | Upper Aquifer - Top of Till | Active |
| HD-9 | 05-Dec-17 | Trichloroethene | 54 | Upper Aquifer - Top of Till | Active |
| HD-9 | 28-Mar-18 | Trichloroethene | 22.2 | Upper Aquifer - Top of Till | Active |
| HD-9 | 13-Dec-18 | Trichloroethene | 59.9 | Upper Aquifer - Top of Till | Active |
| MW-6B-03 | 11-Dec-18 | Trichloroethene | 2.5 | Upper Aquifer - Top of Till | In Active |
| MW-76D-17 | 09-Jan-18 | Trichloroethene | 9.25 | Upper Aquifer - Top of Till | Active |
| MW-76D-17 | 26-Mar-18 | Trichloroethene | 11.6 | Upper Aquifer - Top of Till | Active |
| MW-76D-17 | 11-Dec-18 | Trichloroethene | 7 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 10-Jan-18 | Trichloroethene | 13.8 | Upper Aquifer - Top of Till | Active |

See notes on Page 4.

**Table 2.3**

**Off-Property Groundwater Analytical Results for Constituents of Potential Concern - West of Webster Street, January 2015 - March 2020**

| Well ID | Date | Chemical | Result (ug/L) | Aquifer Zone | Current Status |
|---|---|---|---|---|---|
| MW-77D-17 | 28-Mar-18 | Trichloroethene | 11.5 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 11-Dec-18 | Trichloroethene | 3.5 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 12-Mar-19 | Trichloroethene | 4.7 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 13-Sep-19 | Trichloroethene | 1.7 | Upper Aquifer - Top of Till | Active |
| MW-77D-17 | 17-Mar-20 | Trichloroethene | 14.7 | Upper Aquifer - Top of Till | Active |
| MW-7B-03 | 11-Dec-18 | Trichloroethene | 2.2 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 09-Jan-18 | Trichloroethene | 5.88 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 27-Mar-18 | Trichloroethene | 6.34 | Upper Aquifer - Top of Till | Active |
| MW-83D-17 | 12-Dec-18 | Trichloroethene | 3.4 | Upper Aquifer - Top of Till | Active |
| DAY-11D | 05-Jan-15 | Vinyl chloride | 1.24 | Upper Aquifer - Top of Till | Abandoned |
| HD-8 | 28-Mar-18 | Vinyl chloride | 1.06 | Upper Aquifer - Top of Till | Active |
| MW-7B-03 | 09-Jan-18 | Vinyl chloride | 4.89 | Upper Aquifer - Top of Till | Active |
| MW-7B-03 | 11-Dec-18 | Vinyl chloride | 2.3 | Upper Aquifer - Top of Till | Active |
| MW-21-04 | 05-Jan-15 | cis-1,2-Dichloroethene | 13.9 | Upper Aquifer - Water Table | In Active |
| MW-76S-17 | 12-Mar-19 | cis-1,2-Dichloroethene | 1.4 | Upper Aquifer - Water Table | Active |
| MW-77S-17 | 13-Sep-19 | cis-1,2-Dichloroethene | 1.1 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 11-Dec-18 | cis-1,2-Dichloroethene | 11.4 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Mar-19 | cis-1,2-Dichloroethene | 9.4 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Sep-19 | cis-1,2-Dichloroethene | 13.9 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 11-Jan-18 | cis-1,2-Dichloroethene | 22 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 27-Mar-18 | cis-1,2-Dichloroethene | 8.97 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Dec-18 | cis-1,2-Dichloroethene | 8.7 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Mar-19 | cis-1,2-Dichloroethene | 4.5 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Sep-19 | cis-1,2-Dichloroethene | 34.5 | Upper Aquifer - Water Table | Active |
| MW-8-03 | 27-Mar-18 | cis-1,2-Dichloroethene | 5.1 | Upper Aquifer - Water Table | Active |
| MW-83S-17 | 12-Sep-19 | cis-1,2-Dichloroethene | 8.9 | Upper Aquifer - Water Table | Active |
| MW-83S-17 | 17-Mar-20 | cis-1,2-Dichloroethene | 8.2 | Upper Aquifer - Water Table | Active |
| MW-21-04 | 05-Jan-15 | Tetrachloroethene | 10.7 | Upper Aquifer - Water Table | In Active |
| MW-48-05 | 23-Mar-16 | Tetrachloroethene | 37.8 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 22-Jun-16 | Tetrachloroethene | 29 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 22-Sep-16 | Tetrachloroethene | 23.8 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 28-Mar-18 | Tetrachloroethene | 15 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 12-Dec-18 | Tetrachloroethene | 15.9 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 17-Mar-20 | Tetrachloroethene | 9.1 | Upper Aquifer - Water Table | Active |
| MW-77S-17 | 13-Sep-19 | Tetrachloroethene | 1.7 | Upper Aquifer - Water Table | Active |
| MW-77S-17 | 17-Mar-20 | Tetrachloroethene | 2.6 | Upper Aquifer - Water Table | Active |
| MW-77S-17-DUP | 17-Mar-20 | Tetrachloroethene | 2.9 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 11-Dec-18 | Tetrachloroethene | 3.6 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Mar-19 | Tetrachloroethene | 2.7 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Sep-19 | Tetrachloroethene | 3.8 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 17-Mar-20 | Tetrachloroethene | 1.8 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 11-Jan-18 | Tetrachloroethene | 84 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 27-Mar-18 | Tetrachloroethene | 11.5 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Sep-19 | Tetrachloroethene | 13.2 | Upper Aquifer - Water Table | Active |
| MW-8-03 | 22-Sep-16 | Tetrachloroethene | 6.34 | Upper Aquifer - Water Table | Active |
| MW-8-03 | 12-Dec-18 | Tetrachloroethene | 6.8 | Upper Aquifer - Water Table | Active |
| MW-83S-17 | 12-Sep-19 | Tetrachloroethene | 11.3 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 10-Jan-18 | Tetrachloroethene | 6.28 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 27-Mar-18 | Tetrachloroethene | 5.42 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 11-Dec-18 | Tetrachloroethene | 5.3 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 12-Sep-19 | Tetrachloroethene | 4.6 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 17-Mar-20 | Tetrachloroethene | 6.6 | Upper Aquifer - Water Table | Active |
| MW-84S-17-DUP | 17-Mar-20 | Tetrachloroethene | 6.2 | Upper Aquifer - Water Table | Active |

See notes on Page 4.

**Table 2.3**

**Off-Property Groundwater Analytical Results for Constituents of Potential Concern - West of Webster Street, January 2015 - March 2020**

| Well ID | Date | Chemical | Result (ug/L) | Aquifer Zone | Current Status |
|---|---|---|---|---|---|
| MW-21-04 | 05-Jan-15 | Trichloroethene | 11.7 | Upper Aquifer - Water Table | In Active |
| MW-48-05 | 23-Mar-16 | Trichloroethene | 63.5 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 22-Jun-16 | Trichloroethene | 43.5 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 22-Sep-16 | Trichloroethene | 56.3 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 28-Mar-18 | Trichloroethene | 5.74 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 12-Dec-18 | Trichloroethene | 4.8 | Upper Aquifer - Water Table | Active |
| MW-48-05 | 17-Mar-20 | Trichloroethene | 1.6 | Upper Aquifer - Water Table | Active |
| MW-77S-17 | 13-Sep-19 | Trichloroethene | 1.2 | Upper Aquifer - Water Table | Active |
| MW-77S-17 | 17-Mar-20 | Trichloroethene | 1.5 | Upper Aquifer - Water Table | Active |
| MW-77S-17-DUP | 17-Mar-20 | Trichloroethene | 1.6 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 11-Dec-18 | Trichloroethene | 2.5 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Mar-19 | Trichloroethene | 5.9 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Sep-19 | Trichloroethene | 13.5 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 11-Jan-18 | Trichloroethene | 92.6 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 27-Mar-18 | Trichloroethene | 24.4 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Dec-18 | Trichloroethene | 3.8 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Mar-19 | Trichloroethene | 1.6 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 12-Sep-19 | Trichloroethene | 24.3 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 17-Mar-20 | Trichloroethene | 2.2 | Upper Aquifer - Water Table | Active |
| MW-8-03 | 22-Sep-16 | Trichloroethene | 6.95 | Upper Aquifer - Water Table | Active |
| MW-8-03 | 12-Dec-18 | Trichloroethene | 7.6 | Upper Aquifer - Water Table | Active |
| MW-83S-17 | 12-Sep-19 | Trichloroethene | 4.4 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 11-Dec-18 | Trichloroethene | 1.5 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 12-Sep-19 | Trichloroethene | 1.2 | Upper Aquifer - Water Table | Active |
| MW-84S-17 | 17-Mar-20 | Trichloroethene | 1.3 | Upper Aquifer - Water Table | Active |
| MW-84S-17-DUP | 17-Mar-20 | Trichloroethene | 1.3 | Upper Aquifer - Water Table | Active |
| MW-6A-03 | 23-Mar-16 | Vinyl chloride | 5.22 | Upper Aquifer - Water Table | Active |
| MW-6A-03 | 20-Jun-16 | Vinyl chloride | 2.02 | Upper Aquifer - Water Table | Active |
| MW-6A-03 | 21-Sep-16 | Vinyl chloride | 5.8 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 09-Jan-18 | Vinyl chloride | 1.25 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Mar-19 | Vinyl chloride | 5.5 | Upper Aquifer - Water Table | Active |
| MW-78-17 | 12-Sep-19 | Vinyl chloride | 1.7 | Upper Aquifer - Water Table | Active |
| MW-79-17 | 11-Jan-18 | Vinyl chloride | 1.32 | Upper Aquifer - Water Table | Active |

NOTES:

- (yellow) Most recent MW-57-07 result evaluated for fountain well exposure scenario; 1,1-DCE not evaluated/below MCL
- (blue) Maximum upper aquifer- water table well result evaluated for excavation exposure scenario
- (box) Maximum lower aquifer/upper aquifer result evaluated for geothermal well exposure scenario

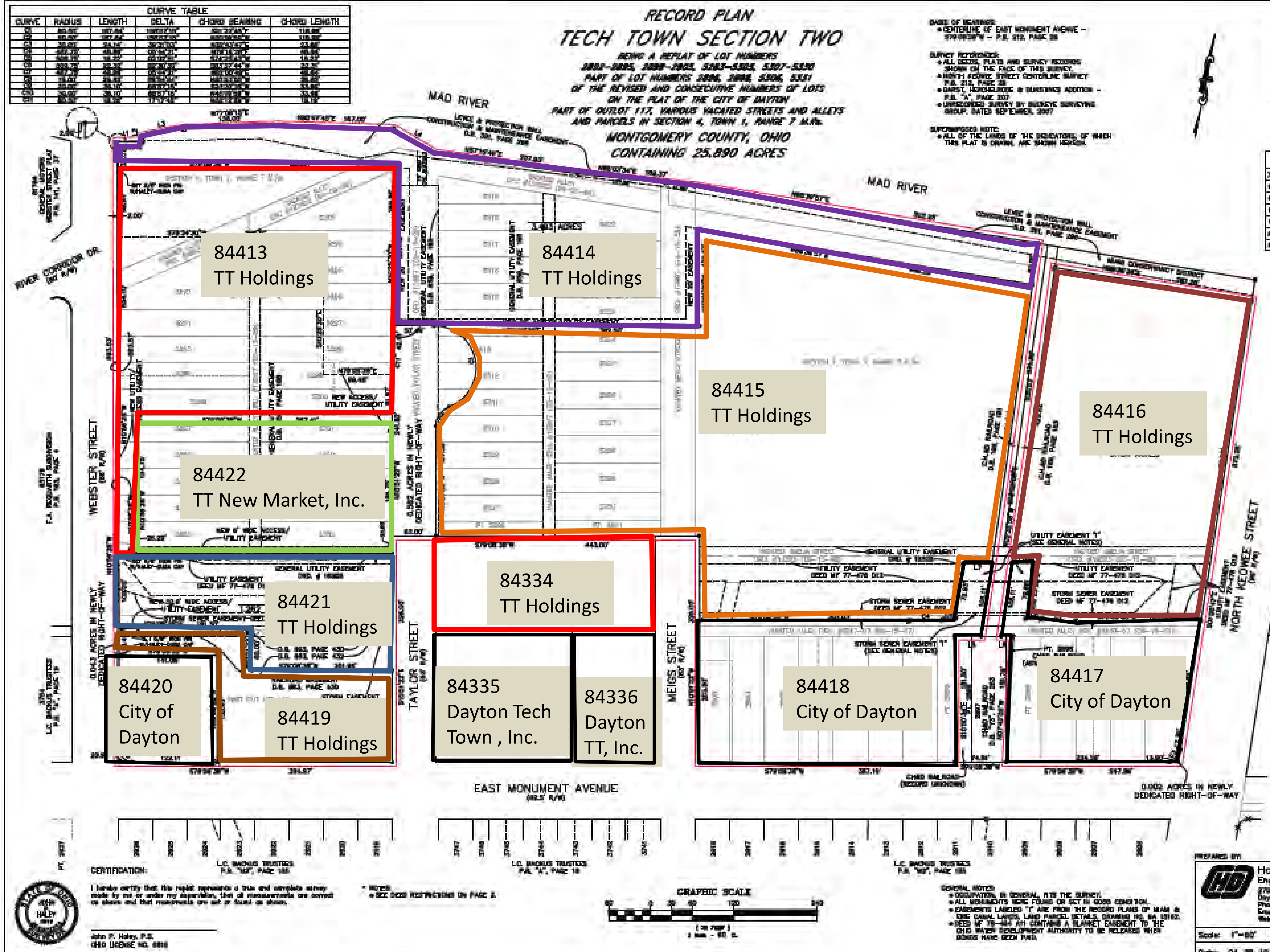
See notes on Page 4.

**Table 3.1**
**Summary of COCs Exceeding Applicable Standards and Proposed Remedial Activities**
**Northern Tech Town Property Boundary**
**Dayton, Ohio**

| Exposure Pathway and Receptor | Exposure Unit | Identified Area | Affected Media | Sampling Location and Collection Depth | Chemical of Concern and Max Concentration | | | Applicable Ohio VAP Generic Standard | Point of Compliance | Type of Remedy Proposed | Cleanup Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Maximum | Entire EU 95% UCL | | | | |
| Direct Contact with Soil - Commercial/Industrial Worker | P Area | N/A | Soil | MW-26-04 (0-2) | TCE (66 mg/kg) | 66 mg/kg | 63.947 mg/kg | 51 mg/kg (C/I GDCSS) | 0 to 2 ft | Soil cover | Prevent Pathway |
| | Greenspace | 3E/5W/21/33 | Soil | MW-23-04 (0-2) | Lead | 6470 mg/kg | 2146 mg/kg (403 mg/kg)** | 800 mg/kg (C/I GDCSS) | 0 to 2 ft | Soil cover | Prevent Pathway |
| | | | | | | | | | | | |
| Direct Contact with Soil and Groundwater - Construction/Excavation Workers | P Area | 11 | Soil | SB-148-04 (0-2) | Lead | 528 mg/kg | 282 mg/kg | 400 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | SB-148-04 (0-2) | TCE | 17 mg/kg | 41.7 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | N/A | Soil | MW-26-04 (0-2) | TCE | 66 mg/kg | 41.7 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | Greenspace | 5C | Soil | BH-181 (0-2) | TCE | 22 mg/kg | 14.9 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | 3E/5W/21/33 | Soil | MW-23-04 (0-2) | Lead | 6470 mg/kg | 411 mg/kg | 400 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | MW-14B-04 (0-2) | TCE | 25 mg/kg | 14.9 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | MW-23-04 (0-2) | TCE | 30 mg/kg | 14.9 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | MW-24-04 (0-2) | TCE | 44 mg/kg | 14.9 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | SB-14-02 (10-12) | Cadmium | 3340 mg/kg | 949 mg/kg | 2600 mg/kg (C/I GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | SB-14-02 (4-6) | TCE | 20 mg/kg | 14.9 mg/kg | 17 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | Soil (2018) | TT-SBC5 (8-10 ft bgs) | PCE | 252 mg/kg | 1.47 mg/kg | 170 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | TT-SBB2 (6-8 ft bgs) | Lead | 9670 mg/kg | 992 mg/kg | 400 mg/kg (CW GDCSS) | 0 to 10 ft | Risk Mitigation Plan | Mitigate Pathway |
| | | | | | | | | | | | |
| Vapor Intrusion - Migration of COCs from Soil to Indoor Air | P Area | Multiple | Indoor Air (future building) | No buildings currently constructed to sample | NA | | | Indoor Air Standards | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | Greenspace | Multiple | Indoor Air (future building) | No buildings currently constructed to sample | NA | | | Indoor Air Standards | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | | | | | | | | | | | |
| Vapor Intrusion - Migration of COCs from Groundwater to Indoor Air | Greenspace | 3E/5W/21/33 | Indoor Air (future building) | MW23-04, MW37-05 | PCE (max 4600 ug/L) | in groundwater | | Groundwater Screening Level 540 ug/L | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | | | | HD-18, MW23-04, MW37-05 | TCE (max 1390 ug/L) | in groundwater | | Groundwater Screening Level 44 ug/L | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | | | | MW23-04 | VC (max 3480 ug/L) | in groundwater | | Groundwater Screening Level 37 ug/L | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | | 3W/6N/16 | | MW9-03 | VC (max 68.3 ug/L) | in groundwater | | Groundwater Screening Level 37 ug/L | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | P Area | n/a | | MW26-04 | TCE (max 93 ug/L) | in groundwater (max was in 2006) | | Groundwater Screening Level 44 ug/L | On-Property Building | Vapor Mitigation System | Mitigate Pathway |
| | | | | | | | | | | | |
| Potable Use of Groundwater from beneath the Property | All | Multiple | Groundwater | Upper Aquifer | 1,1-DCE | 39.4 ug/L- MW-23-04 - 9/2012 | | 7 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | cis-1,2-DCE | 35,000 ug/L- MW-23-04 - 4/2005 | | 70 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | Methylene Chloride | 70 ug/L- MW-23-04 - 11/2006 | | 5 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | PCE | 4600 ug/L- MW-23-04 - 11/2004 | | 5 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | TCE | 1390 ug/L- MW-23-04 - 9/2012 | | 5 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | trans-1,2-DCE | 141 ug/L - MW-23-04 - 9/2012 | | 100 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | VC | 3480 ug/L - MW-23-04 - 9/2012 | | 2 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | Multiple | Groundwater | Till Rich | cis-1,2-DCE | 72 ug/L- MW-36-05 - 11/2006 | | 70 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | PCE | 13ug/L - MW-36-05 - 11/2006 | | 5 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | | | | TCE | 190 ug/L- MW-36-05 - 6/2005 | | 5 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |
| | | Multiple | Groundwater | Lower Aquifer | VC | 4.1 ug/L - MW-39-05 - 9/2006 | | 2 ug/L GUPUS | On-Property | Activity and Use Limitation | Mitigate Pathway |

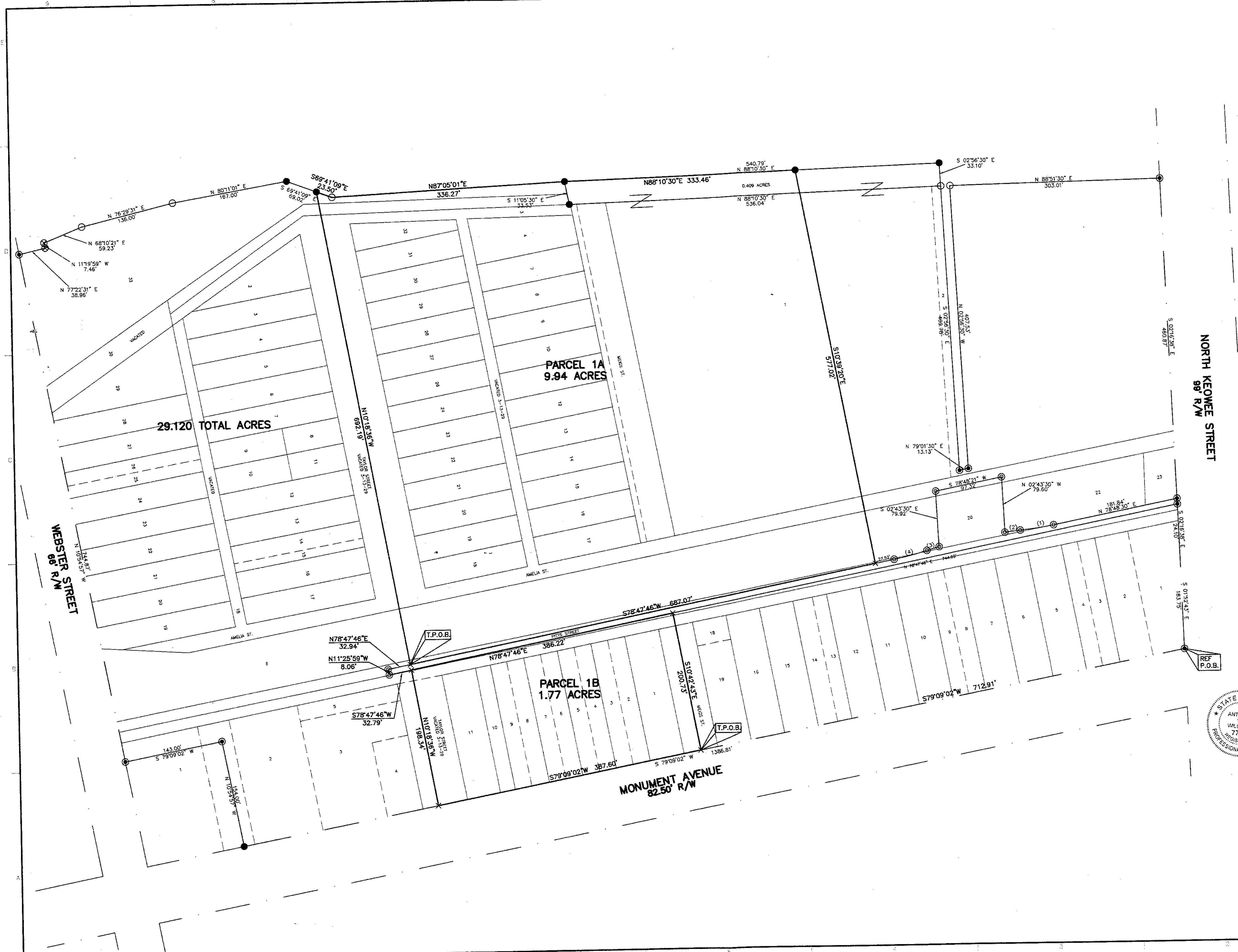
Notes:
[a] Ohio EPA Generic Cleanup Number for Hazardous Waste Closure
AOI = Area of Interest
BKGD = Background concentration
BUSTR = Bureau of Underground Storage Tank Regulations
cis-1,2-DCE = cis-1,2-dichloroethene
C/I = Commercial/Industrial Worker
COC = Chemical of concern
Conc. = Concentration
$C_{SAT}$ = Saturation concentration
Cum = Cumulatively
DCSS = Direct contact soil standard
DRO = Diesel range organics
EU = Exposure unit
ft = feet
GDCSS = Generic direct contact soil standard
GRO = Gasoline range organics
GUPUS = Generic unrestricted potable use standard
LBSV = Leach-based soil value
LNAPL = Light non-aqueous phase liquid
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
PCB = polychlorinated biphenyls
PCE = tetrachloroethene
PSRA = Property specific risk assessment
SVE = Soil Vapor Extraction
TCE = Trichloroethene
TPH = Total Petroleum Hydrocarbons
USD = Urban Setting Designation
µg/L = micrograms per liter
95% UCL -= 95% upper confidence limit on the mean
* sample not included in surface soil 95% UCL calculation
** arithmetic mean

# APPENDIX A
# LEGAL DESCRIPTION



CURVE TABLE
CURVE
RADIUS
LENGTH
DELTA
CHORD BEARING
CHORD LENGTH
RECORD PLAN
TECH TOWN SECTION TWO
MONTGOMERY COUNTY, OHIO
CONTAINING 25.890 ACRES
MAD RIVER
MAD RIVER
RIVER CORRIDOR DR.
WEBSTER STREET
TAYLOR STREET
MEIGS STREET
NORTH KEOWEE STREET
EAST MONUMENT AVENUE
84413
TT Holdings
84414
TT Holdings
84415
TT Holdings
84416
TT Holdings
84422
TT New Market, Inc.
84421
TT Holdings
84334
TT Holdings
84420
City of Dayton
84419
TT Holdings
84335
Dayton Tech Town , Inc.
84336
Dayton TT, Inc.
84418
City of Dayton
84417
City of Dayton
CERTIFICATION:
GRAPHIC SCALE
GENERAL NOTES:
PREPARED BY:

| REVISION RECORD | | |
|---|---|---|
| NO | DATE | DESCRIPTION | BY |




## Curve Table

CURVE (1)
RADIUS= 487.75'
DELTA= 05°44'23"
ARC= 48.86'
CHORD= 48.84'
CHORD BEARING=
S 81°40'41" W

CURVE (2)
RADIUS= 508.75'
DELTA= 02°30'58"
ARC= 22.34'
CHORD= 22.34'
CHORD BEARING=
S 83°28'39" W

CURVE (3)
RADIUS= 509.75'
DELTA= 02°04'26"
ARC= 18.45'
CHORD= 18.45'
CHORD BEARING=
S 74°06'21" W

CURVE (4)
RADIUS= 487.75'
DELTA= 05°44'23"
ARC= 48.86'
CHORD= 48.84'
CHORD BEARING=
S 75°56'20" W

## Boundary Survey Note

This plat constitutes a boundary survey as set forth in the minimum standards for boundary surveying in the State of Ohio, Administrative Code Chapter 4733-37 and promulgated by the Board of Registration for Professional Engineers and Surveyors of the State of Ohio pursuant to Chapter 4733.

## Surveyor's Certificate

This exhibit was based on an actual field survey by Civil & Environmental Consultants, Inc. in November, 2004.

## Legend of Symbols & Abbreviations

- Found P.K. Nail
- Found 5/8" Iron Pipe with an ID Cap stamped WOOLPERT
- Found Chiseled X
- Set P.K. Nail
- Set 3/4" Iron Pipe, 30" in Length with an ID Cap stamped CEC PROP CORNER
- Set Chiseled X

## Situate

Situated in the State of Ohio, County of Montgomery, City of Dayton, Section 4, Township 1, Range 7, and Being a 29.120 Total Acres.

## Basis of Bearings

Bearings were based on State Plane Coordinate System from Delaware County Monuments D-10 to MOT-1091. Ohio South Zone, NAD 83.

STATE OF OHIO ★ ANTHONY W. WILLIAMS 7726 REGISTERED ★ PROFESSIONAL SURVEYOR

Date: 6/21/05

Registered Surveyor: Anthony W. Williams
Registered Land Surveyor No.: 7726
In the State of: Ohio

**Civil & Environmental Consultants, Inc.**
3600 Park 42 Drive, Suite 130B
Cincinnati, OH 45241
(513) 985-0226 (800) 759-5614
Pittsburgh, PA Columbus, OH Indianapolis, IN Nashville, TN
Chicago, IL Export, PA St. Louis, MO

TECH TOWN REDEVELOPMENT SITE
(PHASE 2)
DAYTON, OHIO

| | | | |
|---|---|---|---|
| EDIT DATE: 06/15/05 | DWN BY: MJW | APPROVED BY: | |
| SCALE: 1"= 60 | CHKD. BY: JDD | PROJ NO: 505-071.0001 | |
| BOUNDARY SURVEY | | SHEET 1 OF 1 | DRAWING NUMBER 050-071 |

Civil & Environmental Consultants, Inc.
8740 Orion Place, Suite 100 • Columbus, Ohio 43240
Phone 614.540.6633 • Fax 614.540.6638
CHICAGO, IL. • CINCINNATI, OH • EXPORT, PA. • INDIANAPOLIS IN.
NASHVILLE, TN. • PITTSBURGH, PA. • ST. LOUIS, MO.

# Description of Parcel 1A and 1B for Peerless Realty Group LTD

## Parcel 1A

Situated in the State of Ohio, County of Montgomery, City of Dayton, Section 4, Township 1, Range 7 M.R.s and being all of Lots 5283 thru 5331, and Out Lot 117 of the revised and consecutive numbered lots of the Plat of said City of Dayton, Ohio, and part of vacated Taylor Street, Meigs Street and Amelia Street, and being all of the land conveyed by deeds to General Motor Corporation as recorded in Deed Book 732, Page 519, Deed Book 1260, Page 357, Deed Book 2316, Page 273, Deed Book 440, Page 478, Deed Microfiche No. 77-588A07, Deed Book 2308, Page 506, and Deed Microfiche No. 79-138E09 and part of thee land conveyed in Deed Microfiche No 77-467D12 (all references to deeds, microfiche, plats, surveys, etc. refer to the records of the Montgomery County Recorders Office, unless noted otherwise), said tract of land being more particularly bounded and described as follows:

Beginning for reference with a set P.K. Nail at the intersection of the north right-of-way line of Monument Avenue and the west right-of-way line of North Keowee Street;

Thence South 79°09'02" West, following said right-of-way, a distance of 1100.51 feet to a Set Chiseled "X" in vacated Taylor Street;

Thence North 10°18'36" West, following said vacated Taylor Street, a distance of 198.34 feet to a Set Chiseled "X" in the southerly right-of-way line of Pitts Street;

Thence South 78°47'46" West, following said southerly right-of-way line, a distance of 32.79 feet to a Found P.K. Nail;

Thence leaving said right-of-way line, North 11°25'59" West, a distance of 8.06 feet to a Found P.K. Nail in the northerly right-of-way line of Pitts Street;

Thence North 78°47'46" East, following said northerly right-of-way line, a distance of 32.94 feet to a Set Chiseled "X", said Set Chiseled "X" being the True Point of Beginning;

Thence leaving said northerly right-of-way line, North 10°18'36" West, following vacated Taylor Street, a distance of 692.19 feet to a Set ¾" Iron Pipe, 30" in length with an ID cap stamped CEC PROP CORNER in the southerly line of a tract of land conveyed to The City of Dayton by Deed Book 117, Page 181;

Thence with the following three (3) courses along said southerly line:

1. South 69°41'09" East a distance of 23.50 feet to a Found 5/8" Iron Pipe with an ID cap stamped Woolpert;
2. North 87°05'01" East a distance of 336.27 feet to a Set ¾" Iron Pipe, 30" in length with an ID cap stamped CEC PROP CORNER;
3. North 88°10'30" East a distance of 333.46 feet to a Set ¾" Iron Pipe, 30" in length with an ID cap stamped CEC PROP CORNER;

Thence leaving said southerly line South 10°39'20" East, with a new severance line, a distance of 577.02 feet to a Set Chiseled "X" in the northerly right-of-way line of Pitts Street;

Thence South 78°47'46" West, following said northerly right-of-way line, a distance of 687.07 feet to the True Point of Beginning;

Containing 9.94 acres, more or less, subject to all easements, right-of-ways, and restrictions.

Bearings were based on State Plane Coordinate System from Delaware County Monuments D-10 to MOT-1091. Ohio South Zone, NAD83.

This description was based on field survey performed by Civil & Environmental Consultants in November, 2004.

**Parcel 1B**

Situated in the State of Ohio, County of Montgomery, City of Dayton, Section 4, Township 1, Range 7 M.R.s, and being all of Lots 3484 thru 3490 and Lots 2892 thru 2905, and part of vacated Meigs Street and Taylor Street, and part of the lands conveyed by Deed to General Motors Corporation as recorded in Deed Book 732, Page 519, (all references to deed, microfiche, plats, surveys, etc. refer to the records of the Montgomery County Recorders Office, unless noted otherwise), said tract of land being more particularly bounded and described as follows:

Beginning for reference with a set P.K. Nail at the intersection of the north right-of-way line of Monument Avenue and the west right-of-way line of North Keowee Street;

Thence South 79°09'02" West following the east right-of-way line of Monument Avenue, a distance of 712.91 feet to a Set Chiseled "X" in the centerline of vacated Meigs Street, said Chiseled "X" being the True Point of Beginning;

Thence South 79°09'02" West, following said right-of-way, a distance of 387.60 feet to a Set Chiseled "X" in vacated Taylor Street;

Thence North 10°18'36" West, following said vacated Taylor Street, a distance of 198.34 feet to a Set Chiseled "X" in the southerly right-of-way line of Pitts Street;

Thence North 78°47'46" East, following said southerly right-of-way line, a distance of 386.22 feet to a Set Chiseled "X" in the centerline of vacated Meigs Street;

Thence South 10°42'43" East, following said centerline, a distance of 200.73 feet to the True Point of Beginning

Containing 1.77 acres, more or less, subject to all easements, right-of-ways and restrictions.

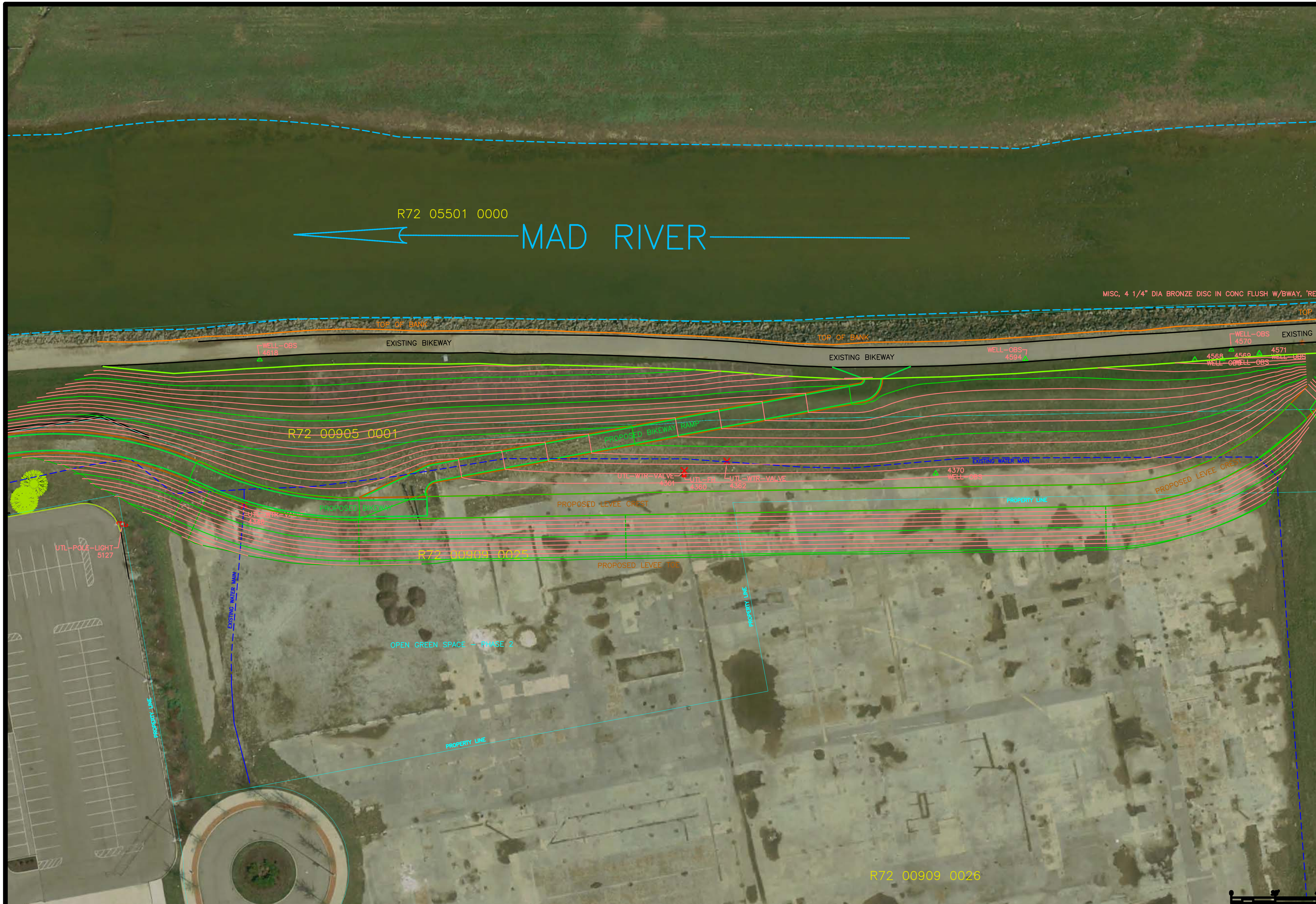
Bearings were based on State Plane Coordinate System from Delaware County Monuments D-10 to MOT-1091. Ohio South Zone, NAD83.

Anthony W. Williams P.S. 7726

6/21/05
Date

STATE OF OHIO
ANTHONY W. WILLIAMS
7726
REGISTERED
PROFESSIONAL SURVEYOR

# APPENDIX B
# LEVEE MODIFICATION PLANS

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REVISION DESCRIPTION

DATE

MCD
MIAMI CONSERVANCY DISTRICT

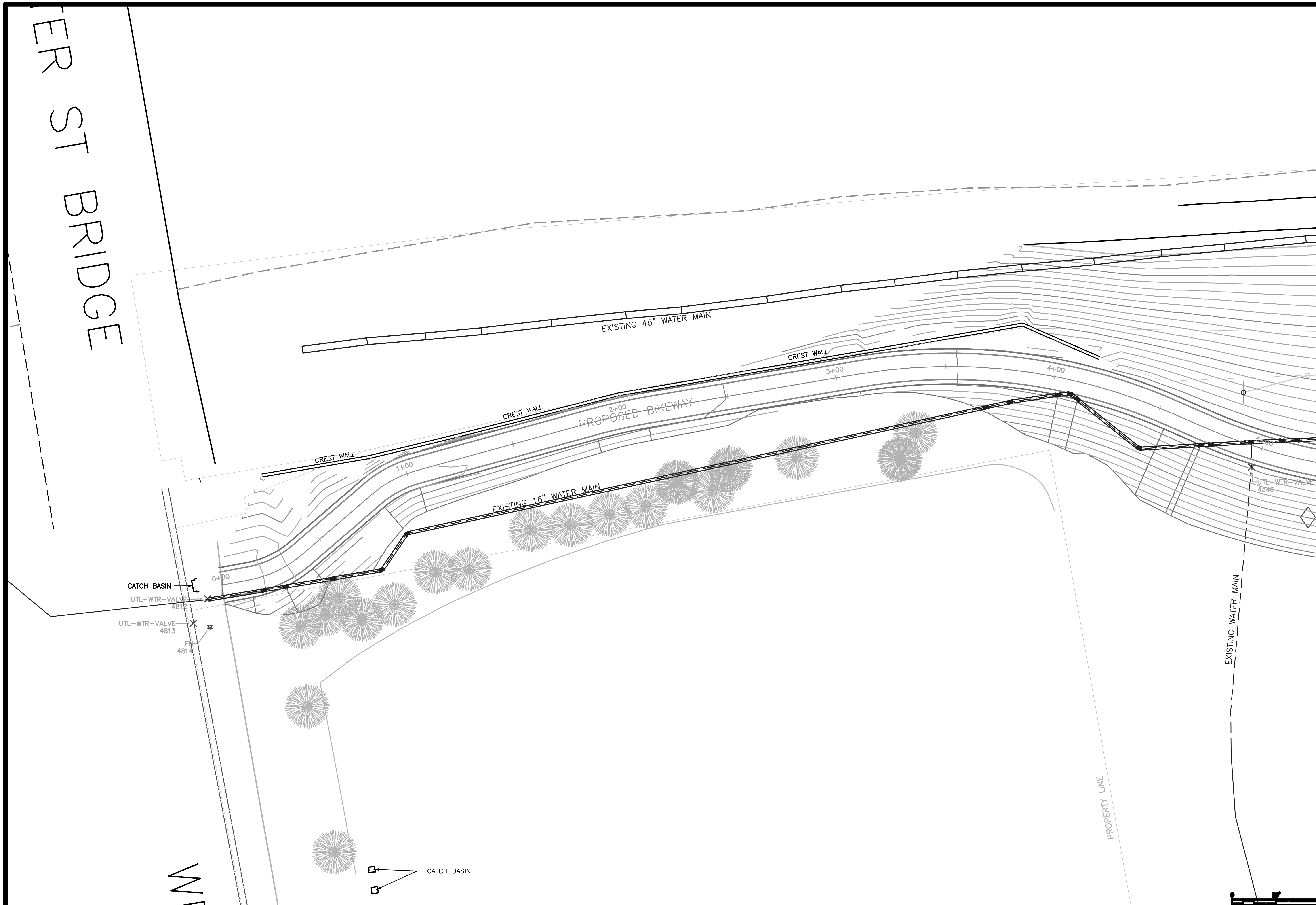
DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT
DRAFT OPTION 5

DATE: 04/12/2019

DRAWN BY: DPO

MCD NUMBER: .

SHEET: 2 of __

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| REVISION DESCRIPTION | DATE |
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MIAMI CONSERVANCY DISTRICT

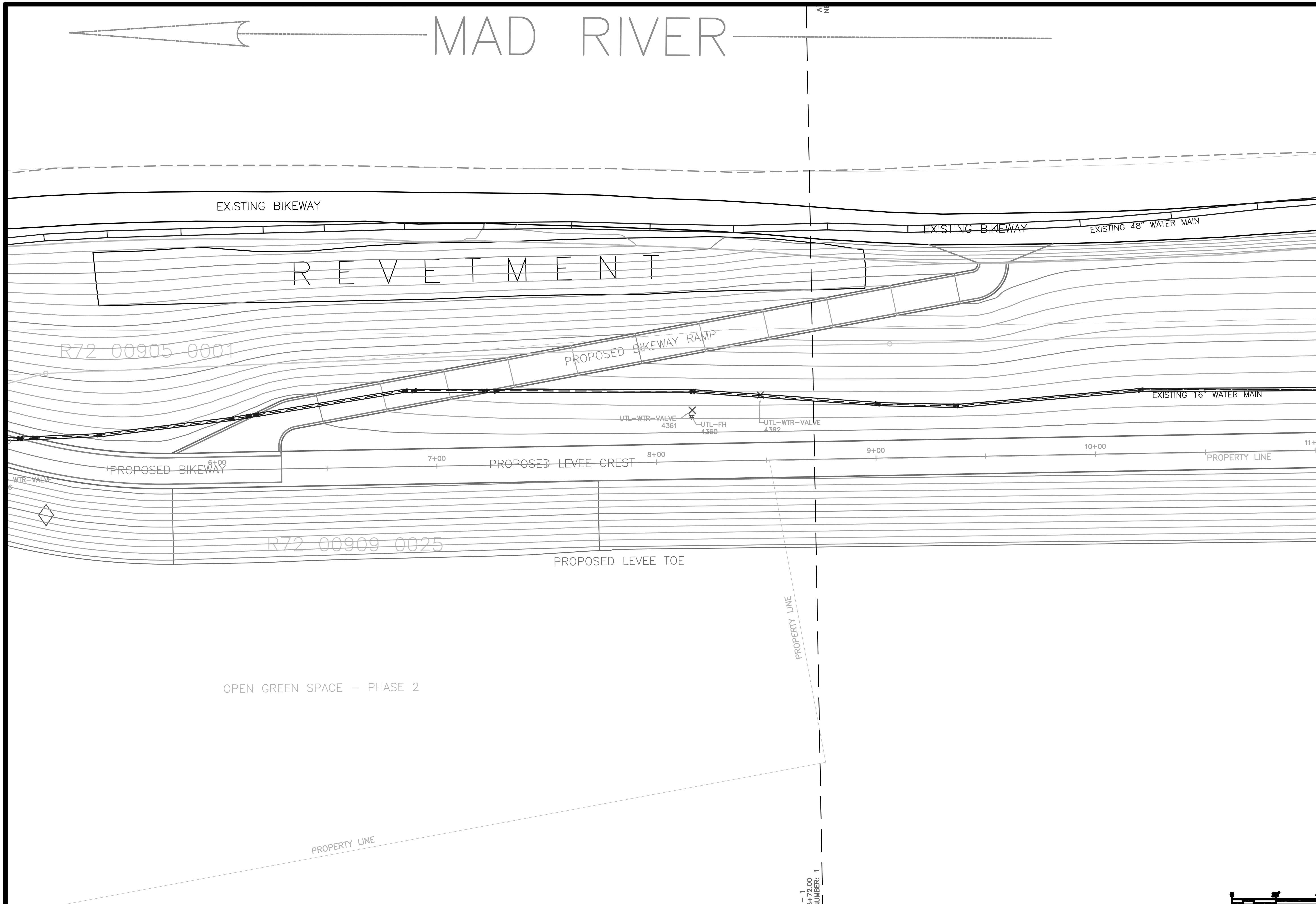
DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE: 07/26/2019

DRAWN BY: DPO

MCD NUMBER: .

SHEET: 4 of __

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REVISION DESCRIPTION

DATE

MCD
MIAMI CONSERVANCY DISTRICT

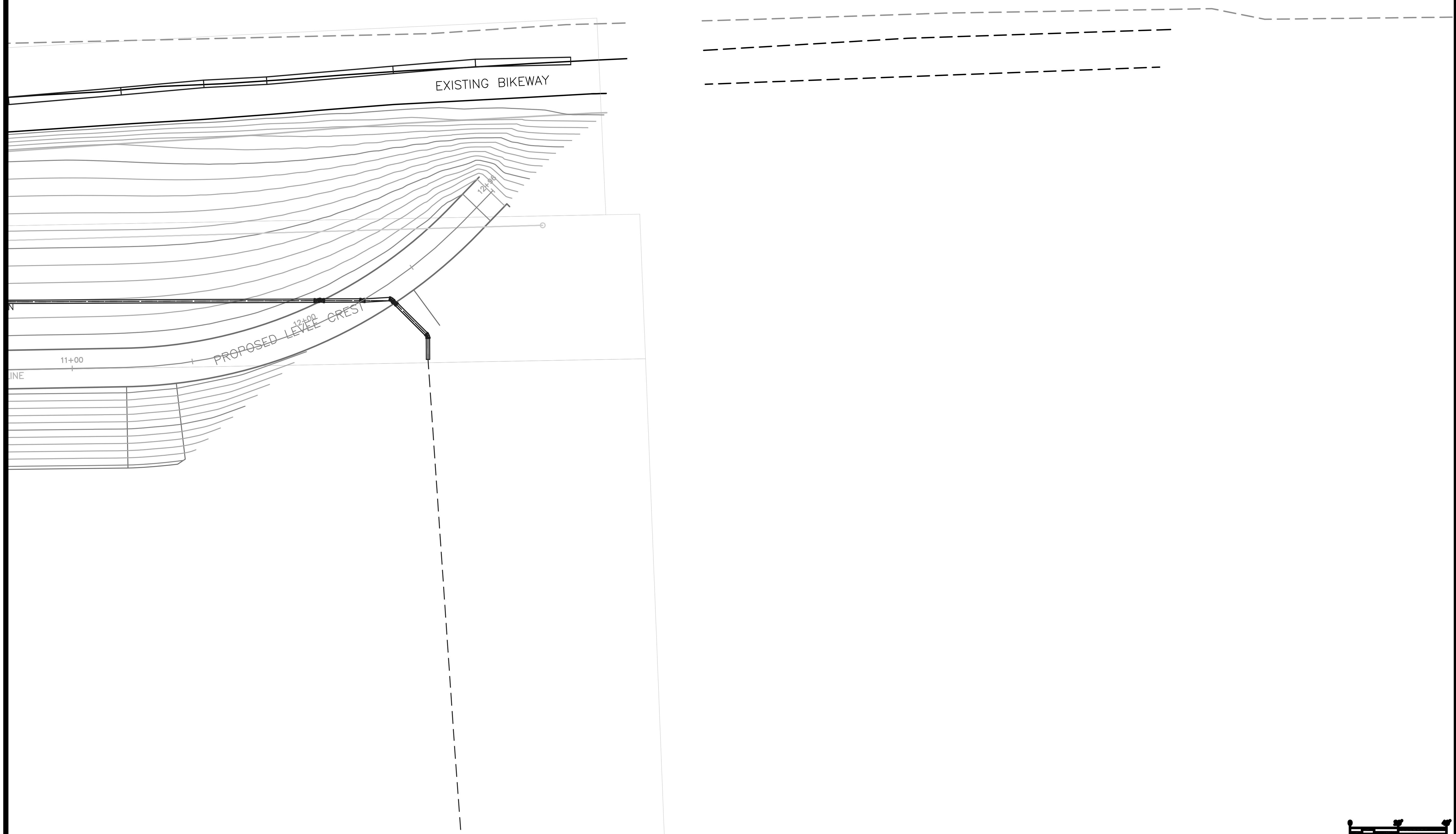
DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE:
07/26/2019

DRAWN BY:
DPO

MCD NUMBER:
.

SHEET:
5 of __

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| REVISION DESCRIPTION | | | | |
|---|---|---|---|---|
| DATE | | | | |

MCD
MIAMI CONSERVANCY DISTRICT

DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE:
07/26/2019

DRAWN BY:
DPO

MCD NUMBER:
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6 of __

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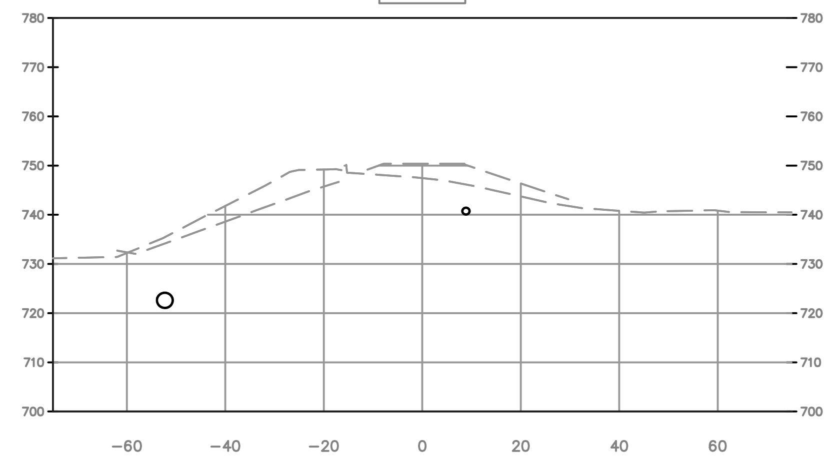

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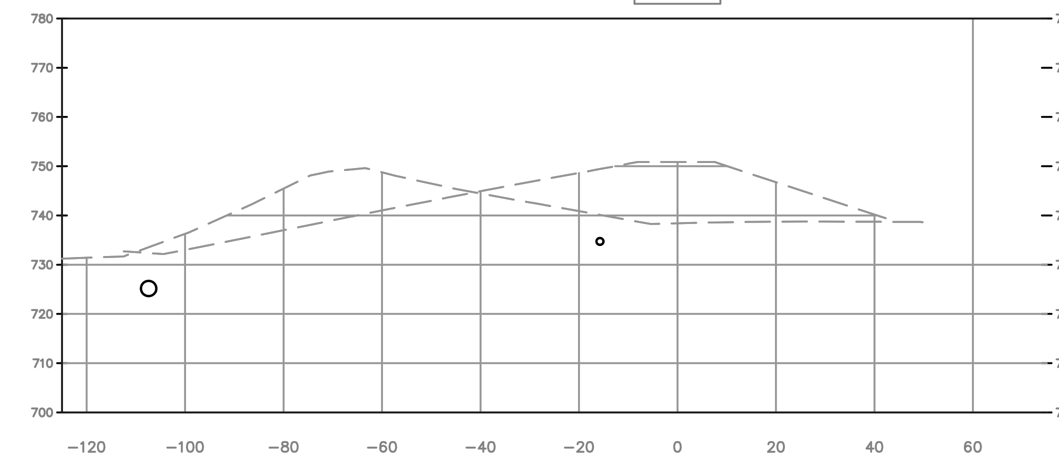

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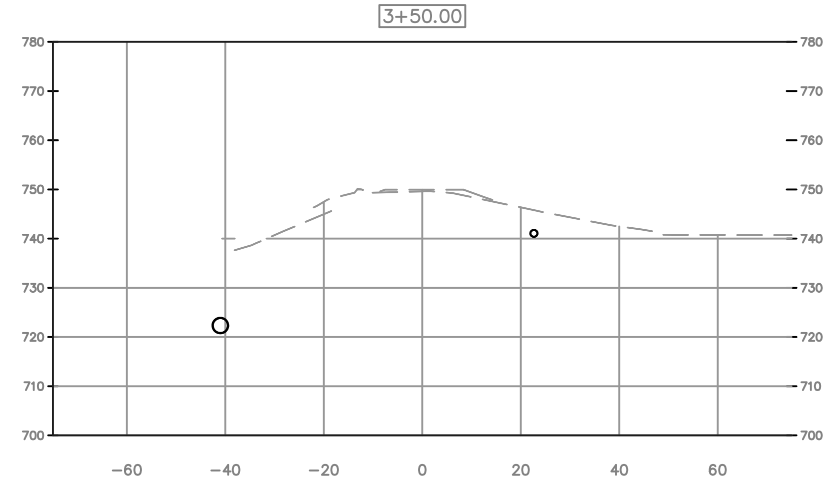

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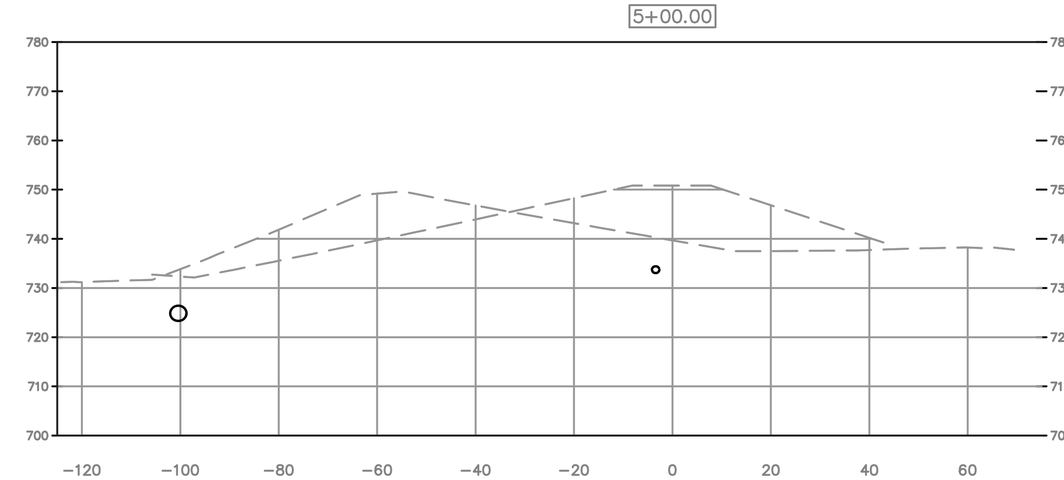

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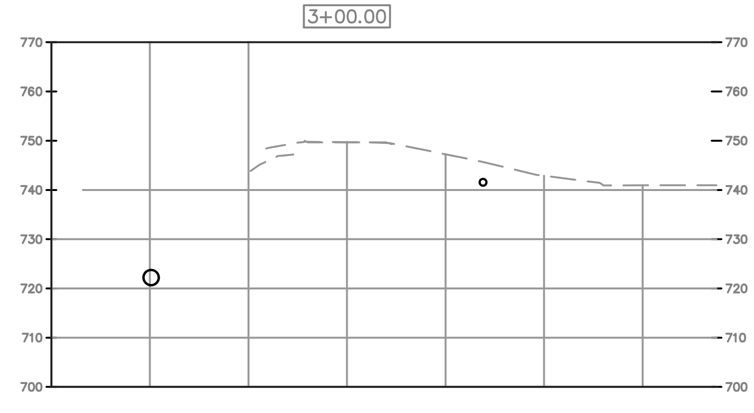

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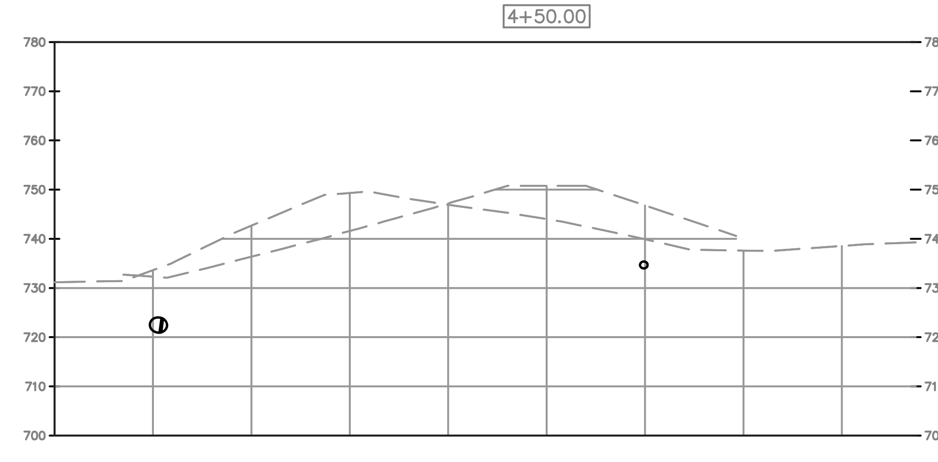

REVISION DESCRIPTION

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MCD
MIAMI CONSERVANCY DISTRICT

DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE: 07/26/2019

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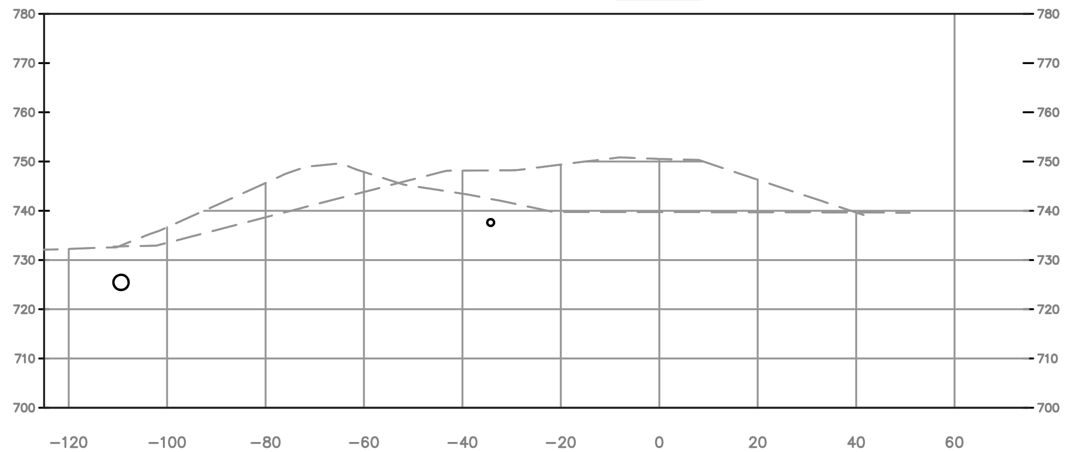


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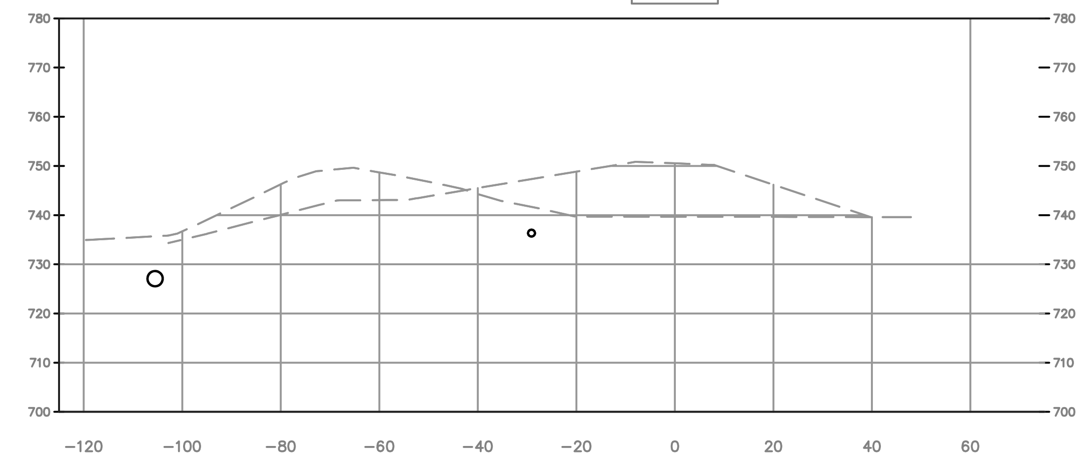


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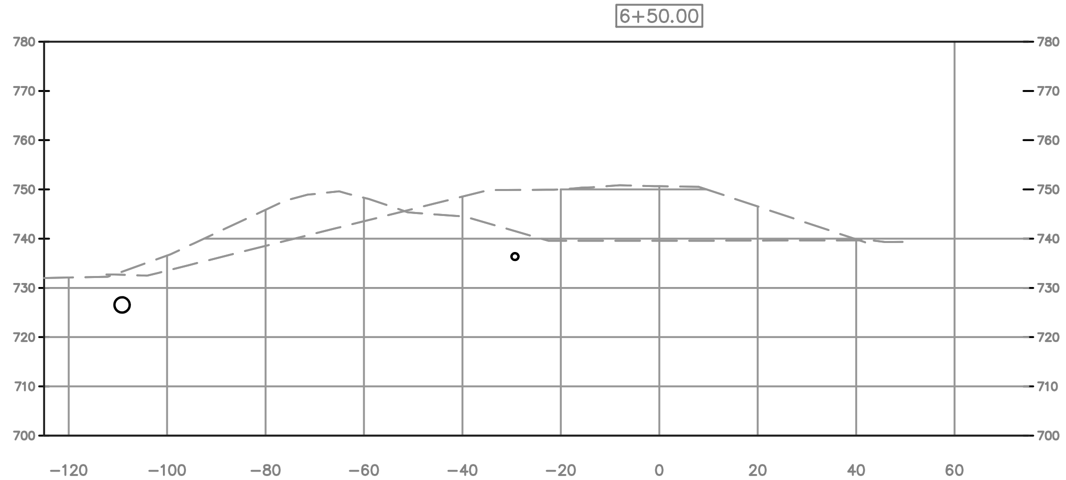


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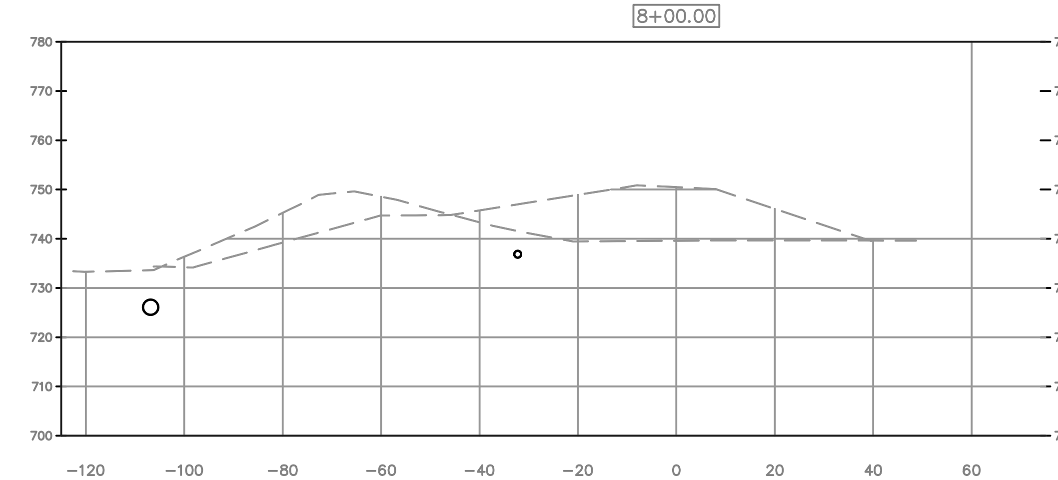


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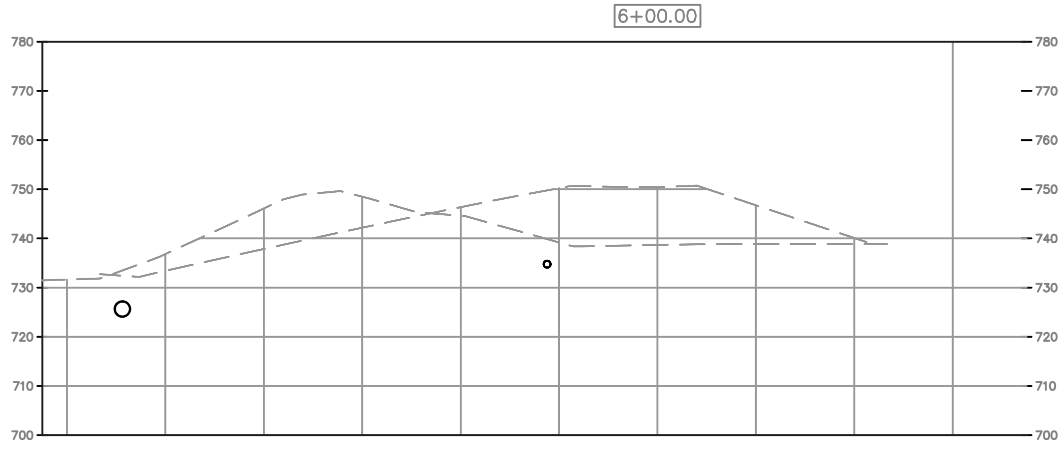


REVISION DESCRIPTION

DATE

MCD
MIAMI CONSERVANCY DISTRICT

DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE: 07/26/2019

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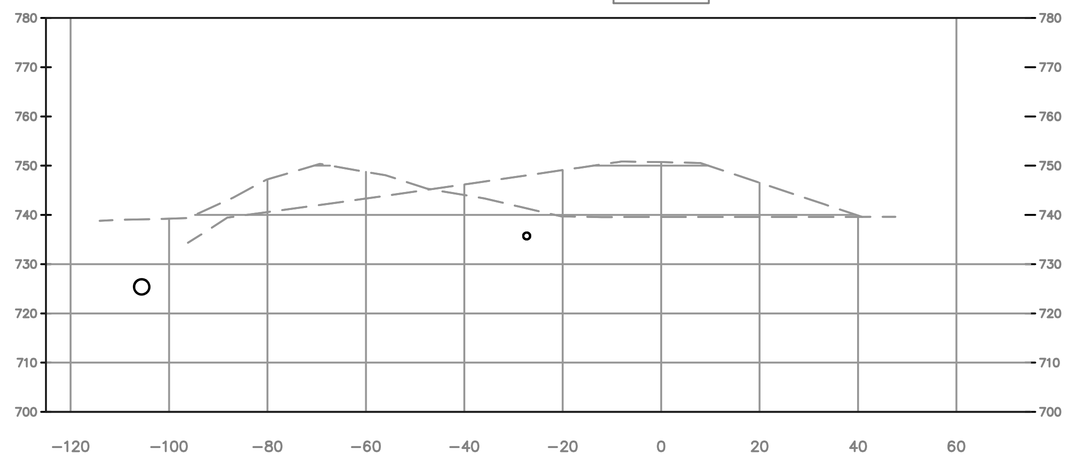


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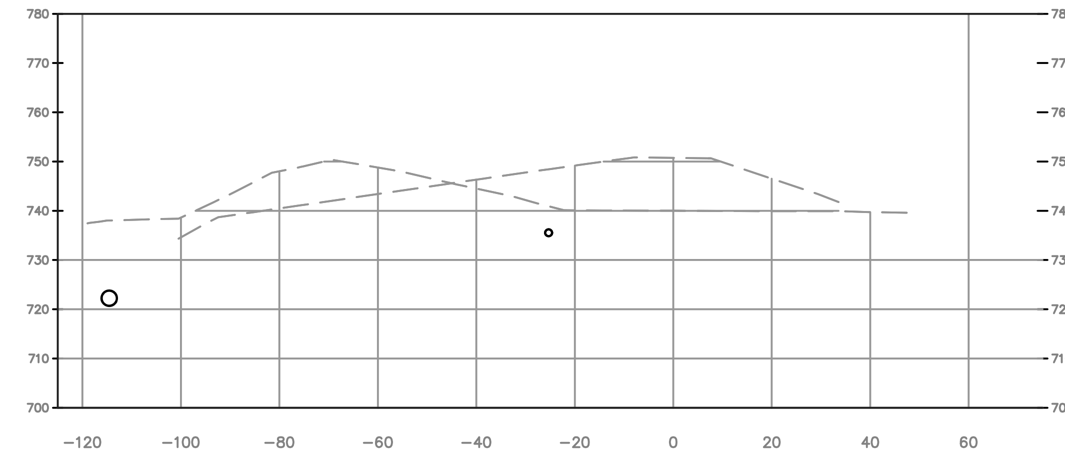


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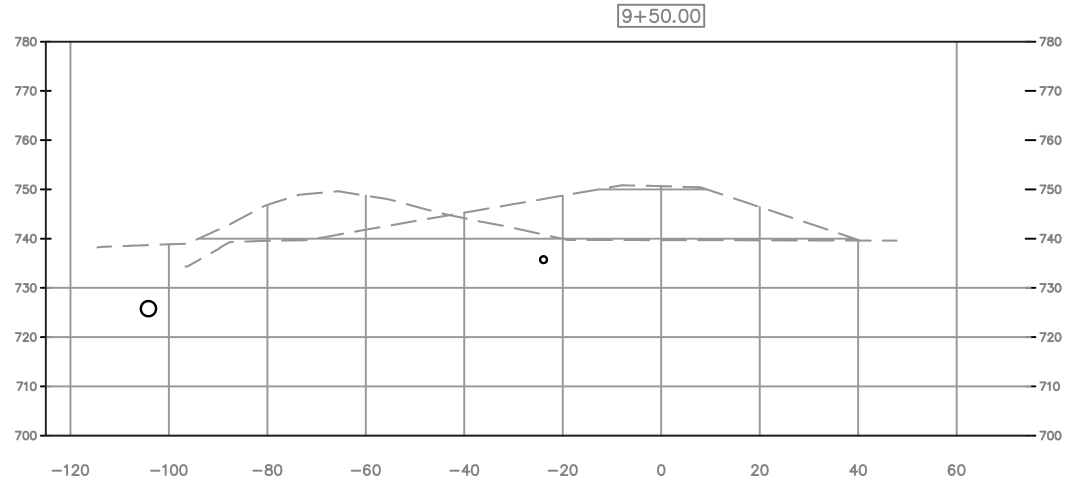


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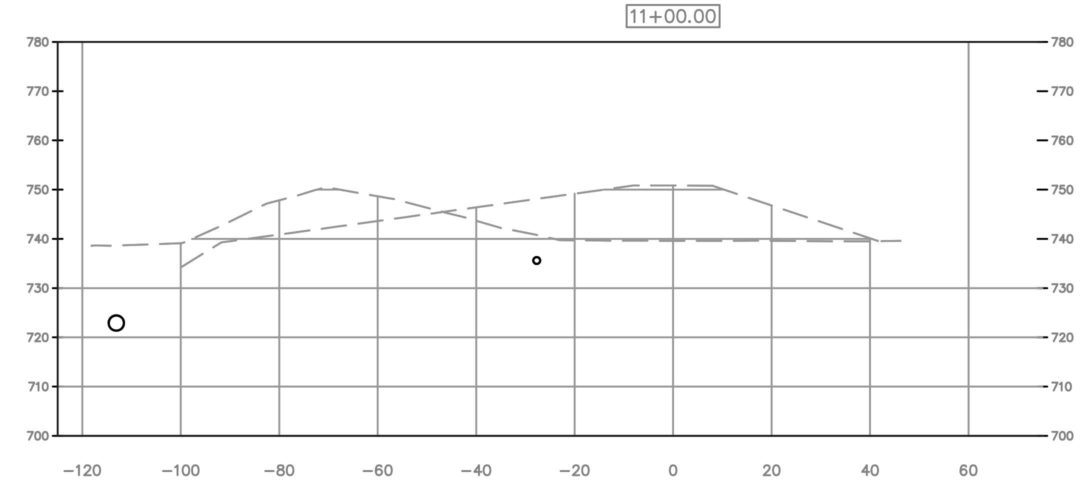


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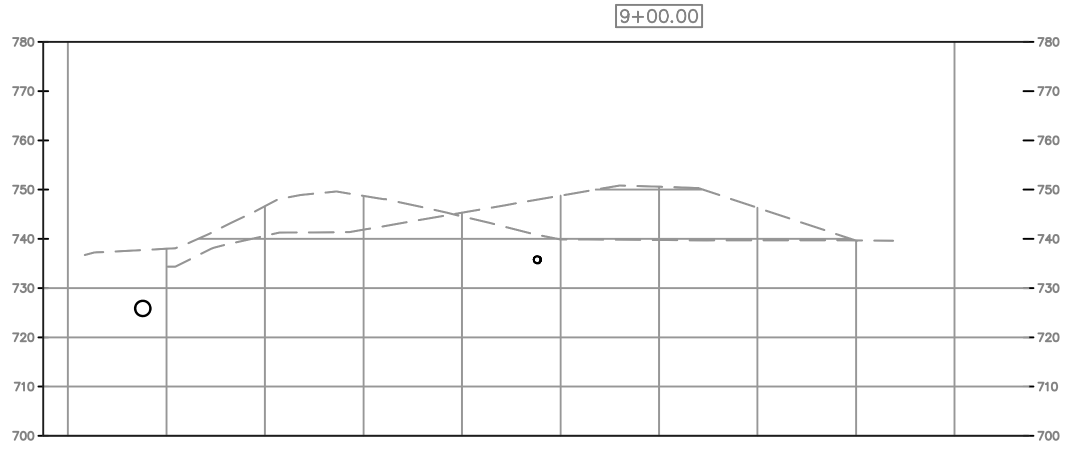


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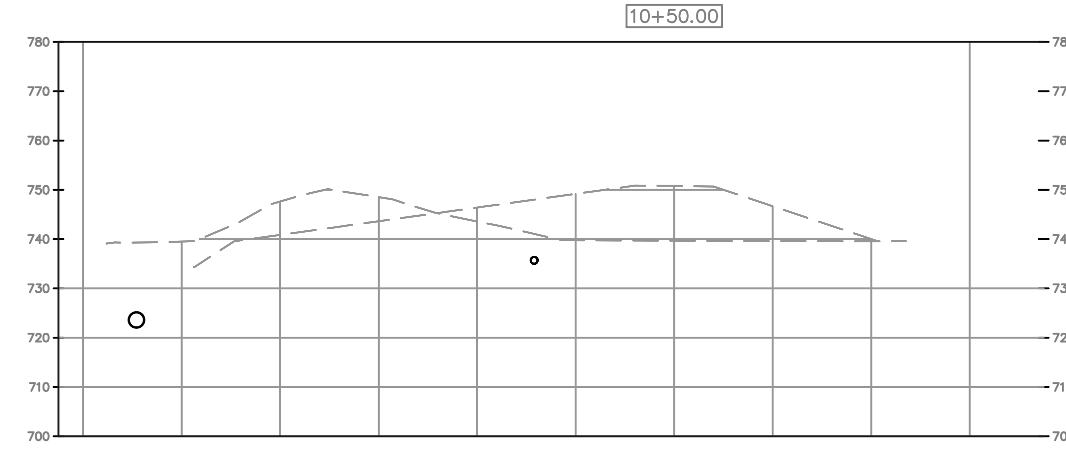


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REVISION DESCRIPTION

DATE

MCD
MIAMI CONSERVANCY DISTRICT

DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE:
07/26/2019

DRAWN BY:
DPO

MCD NUMBER:
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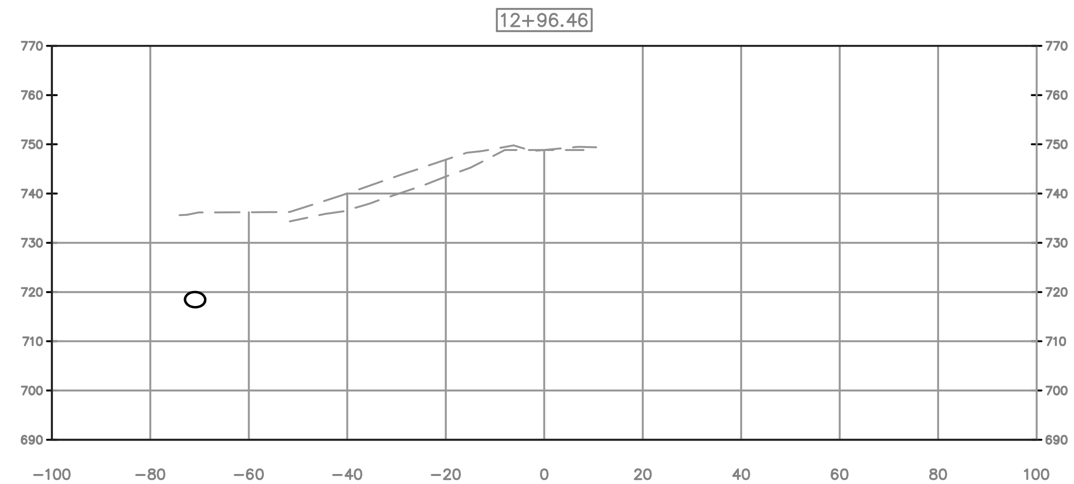
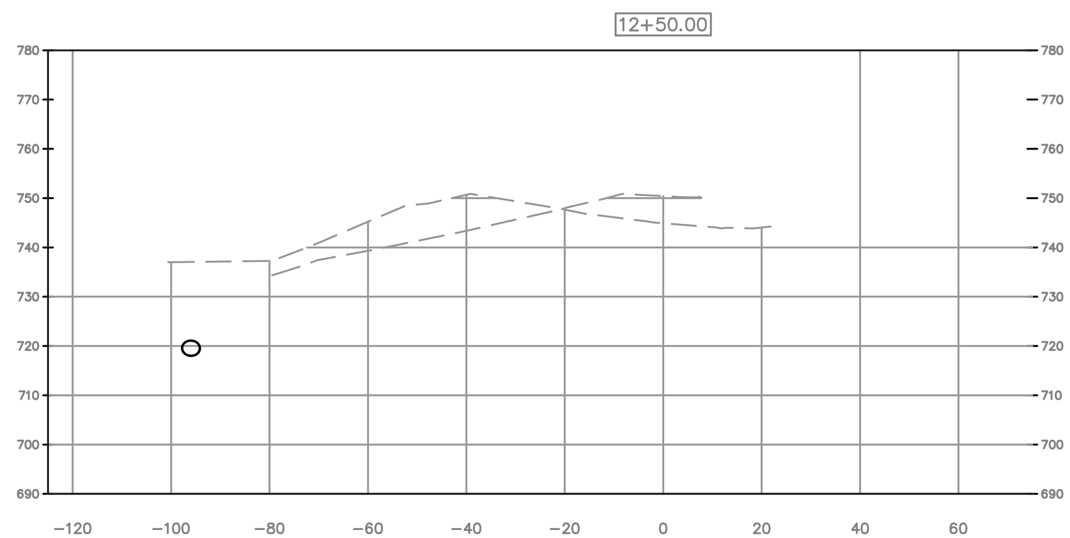
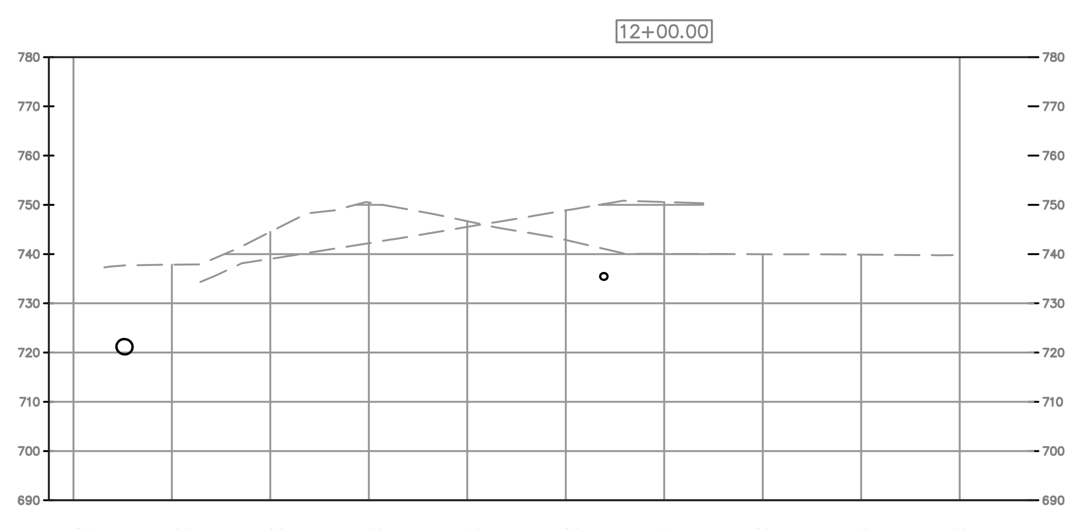
SHEET:
9 of __




REVISION DESCRIPTION

DATE

MCD
MIAMI CONSERVANCY DISTRICT

DAYTON
MAD RIVER, LEFT BANK
WEBSTER STATION
LEVEE IMPROVEMENT

DATE: 07/26/2019

DRAWN BY: DPO

MCD NUMBER: .

SHEET: 10 of __

# APPENDIX C
# RISK EVALUATION CALCULATIONS – GEOTHERMAL WELL MAINTENANCE WORKER EXPOSURE SCENARIO

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 0 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 0 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 4950 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 4950 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 1 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 0 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 0 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 0 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 1 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 1 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 0 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 120 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 0 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 0 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 0 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 120 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 120 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 0 |
| $ET_{res}$ (exposure time) hours/day | 24 | 1 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 1 |

```
Geothermal Well Exposure Scenario
Maximum Detected 2015-2019
Upper and Lower Aquifer
West of VAP property wells
```

Output generated 11MAR2020:15:46:23

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 1 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 1 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 1 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 0 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 0 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 0 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 0 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.008 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.008 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0 |
| K (volatilization factor of Andelman) L/$m^3$ | 0.5 | 0.05 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{2-6}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{6-16}$ (mutagenic skin surface area) $cm^2$ | 19652 | 0 |
| $SA_{16-26}$ (mutagenic skin surface area) $cm^2$ | 19652 | 3300 |

Output generated 11MAR2020:15:46:23

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res\text{-}a}$ (skin surface area - adult) $cm^2$ | 19652 | 3300 |
| $SA_{res\text{-}c}$ (skin surface area - child) $cm^2$ | 6365 | 0 |
| $l_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

Output generated 11MAR2020:15:46:23

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water

**Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.**

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | 75-35-4 | No | Yes | Organics | - | | - | | 5.00E-02 | I | 2.00E-01 | I | 1 |
| Dichloroethylene, 1,2-cis- | 156-59-2 | No | Yes | Organics | - | | - | | 2.00E-03 | I | - | | 1 |
| Tetrachloroethylene | 127-18-4 | No | Yes | Organics | 2.10E-03 | I | 2.60E-07 | I | 6.00E-03 | I | 4.00E-02 | I | 1 |
| Trichloroethylene | 79-01-6 | Yes | Yes | Organics | 4.60E-02 | I | 4.10E-06 | I | 5.00E-04 | I | 2.00E-03 | I | 1 |
| Vinyl Chloride | 75-01-4 | Yes | Yes | Organics | 7.20E-01 | I | 4.40E-06 | I | 3.00E-03 | I | 1.00E-01 | I | 1 |

| $K_p$\ (cm/hr) | MW | B (unitless) | $t^*$ (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.17E-02 | 96.944 | 4.43E-02 | 8.81E-01 | 3.67E-01 | 1 | Yes | - | - | 3.69E+00 | 7.00E+00 | - | - |
| 1.10E-02 | 96.944 | 4.17E-02 | 8.81E-01 | 3.67E-01 | 1 | Yes | - | - | 1.47E-01 | 7.00E+01 | - | - |
| 3.34E-02 | 165.83 | 1.65E-01 | 2.14E+00 | 8.92E-01 | 1 | Yes | 2.46E+00 | - | 4.42E-01 | 5.00E+00 | 1.52E+06 | 2.82E+04 |
| 1.16E-02 | 131.39 | 5.11E-02 | 1.37E+00 | 5.72E-01 | 1 | Yes | 1.12E-01 | - | 3.69E-02 | 5.00E+00 | 6.90E+04 | 4.60E+03 |
| 8.38E-03 | 62.499 | 2.55E-02 | 5.65E-01 | 2.35E-01 | 1 | Yes | 7.17E-03 | - | 2.21E-01 | 2.00E+00 | 4.44E+03 | 5.87E+02 |

| Inhalation SL TR=1E-06 (ug/L) | Carcinogenic SL TR=1E-06 (ug/L) | Ingestion SL Child THQ=1 (ug/L) | Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | 2.43E+06 | 1.83E+05 | 2.92E+05 | 1.07E+05 | 1.07E+05 nc |
| - | - | - | - | - | - | 9.73E+04 | 7.77E+03 | - | 7.20E+03 | 7.20E+03 nc |
| 3.93E+05 | 2.59E+04 | - | - | - | - | 2.92E+05 | 5.07E+03 | 5.84E+04 | 4.59E+03 | 4.59E+03 nc |
| 2.49E+04 | 3.68E+03 | - | - | - | - | 2.43E+04 | 1.52E+03 | 2.92E+03 | 9.60E+02 | 9.60E+02 nc |
| 4.54E+00 | 4.51E+00 | - | - | - | - | 1.46E+05 | 1.81E+04 | 1.46E+05 | 1.45E+04 | 4.51E+00 ca |

Output generated 11MAR2020:15:46:23

# Site-specific
# Resident Risk for Tap Water

| Chemical | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$\ (cm/hr) | MW | B (unitless) | t* (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | - | | - | | 5.00E-02 | I | 2.00E-01 | I | 1 | 1.17E-02 | 96.944 | 4.43E-02 | 8.81E-01 |
| Dichloroethylene, 1,2-cis- | - | | - | | 2.00E-03 | I | - | | 1 | 1.10E-02 | 96.944 | 4.17E-02 | 8.81E-01 |
| Tetrachloroethylene | 2.10E-03 | I | 2.60E-07 | I | 6.00E-03 | I | 4.00E-02 | I | 1 | 3.34E-02 | 165.83 | 1.65E-01 | 2.14E+00 |
| Trichloroethylene | 4.60E-02 | I | 4.10E-06 | I | 5.00E-04 | I | 2.00E-03 | I | 1 | 1.16E-02 | 131.39 | 5.11E-02 | 1.37E+00 |
| Vinyl Chloride | 7.20E-01 | I | 4.40E-06 | I | 3.00E-03 | I | 1.00E-01 | I | 1 | 8.38E-03 | 62.499 | 2.55E-02 | 5.65E-01 |
| **Total Risk/HI* | *-* | | *-* | | *-* | | *-* | | *-* | *-* | *-* | *-* | *-* |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event\ (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | 3.67E-01 | 1 | Yes | - | - | 3.69E+00 | 7.00E+00 | 1.32E+01 | - | - | - |
| Dichloroethylene, 1,2-cis- | 3.67E-01 | 1 | Yes | - | - | 1.47E-01 | 7.00E+01 | 6.58E+02 | - | - | - |
| Tetrachloroethylene | 8.92E-01 | 1 | Yes | 2.46E+00 | - | 4.42E-01 | 5.00E+00 | 1.71E+02 | 1.12E-10 | 6.07E-09 | 4.35E-10 |
| Trichloroethylene | 5.72E-01 | 1 | Yes | 1.12E-01 | - | 3.69E-02 | 5.00E+00 | 9.56E+02 | 1.38E-08 | 2.08E-07 | 3.83E-08 |
| Vinyl Chloride | 2.35E-01 | 1 | Yes | 7.17E-03 | - | 2.21E-01 | 2.00E+00 | 2.10E+01 | 4.73E-09 | 3.58E-08 | 4.62E-06 |
| **Total Risk/HI* | *-* | *-* | | *-* | *-* | *-* | *-* | *-* | *1.87E-08* | *2.50E-07* | *4.66E-06* |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | - | - | - | - | - | 5.42E-06 | 7.22E-05 | 4.52E-05 | 1.23E-04 |
| Dichloroethylene, 1,2-cis- | - | - | - | - | - | 6.76E-03 | 8.46E-02 | - | 9.14E-02 |
| Tetrachloroethylene | 6.61E-09 | - | - | - | - | 5.86E-04 | 3.37E-02 | 2.93E-03 | 3.72E-02 |
| Trichloroethylene | 2.60E-07 | - | - | - | - | 3.93E-02 | 6.29E-01 | 3.27E-01 | 9.95E-01 |
| Vinyl Chloride | 4.66E-06 | - | - | - | - | 1.44E-04 | 1.16E-03 | 1.44E-04 | 1.45E-03 |
| **Total Risk/HI* | *4.93E-06* | *-* | *-* | *-* | *-* | *4.68E-02* | *7.48E-01* | *3.30E-01* | *1.13E+00* |

Output generated 11MAR2020:15:46:23

# APPENDIX D
# RISK EVALUATION CALCULATIONS – CONSTRUCTION/MAINTENANCE WORKER SHALLOW GROUNDWATER CONTACT SCENARIO

# Excavation/Maintenance Worker in Trench - Upper Aquifer Water Table

| Chemical | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk | Carcinogenic Risk | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | 7 | 2.5 | -- | -- | -- | -- | 1.03E-06 | 1.37E-05 | 4.17E-05 | 5.64E-05 |
| Dichloroethylene, 1,2-cis- | 70 | 34.5 | -- | -- | -- | -- | 3.54E-04 | 4.44E-03 | -- | 4.79E-03 |
| Tetrachloroethylene | 5 | 37.8 | 2.49E-11 | 1.34E-09 | 2.74E-10 | 1.64E-09 | 1.29E-04 | 7.45E-03 | 1.84E-03 | 9.42E-03 |
| Trichloroethylene | 5 | 92.6 | 1.34E-09 | 2.01E-08 | 1.33E-08 | 3.48E-08 | 3.81E-03 | 6.09E-02 | 1.14E-01 | 1.79E-01 |
| Vinyl Chloride | 2 | 5.8 | 1.31E-09 | 9.88E-09 | 9.64E-06 | 9.65E-06 | 3.97E-05 | 3.20E-04 | 3.00E-04 | 6.60E-04 |
| **Total Risk/HI* | - | - | *2.7E-09* | *3.1E-08* | *9.7E-06* | *9.7E-06* | *0.0043* | *0.073* | *0.116* | *0.194* |

RSL Calculator Output generated 12MAR2020:11:05:23

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

Excavation/Maintenance Worker
Upper Aquifer Water Table Wells

1,1-DCE

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 0 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 0 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 4950 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 4950 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 1 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 0 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 0 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 0 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 1 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 1 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 0 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 120 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 0 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 0 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 0 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 120 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 120 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 0 |
| $ET_{res}$ (exposure time) hours/day | 24 | 1 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 1 |

Output generated 12MAR2020:10:50:25

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 1 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 1 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 1 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 0 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 00 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 0 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 0 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.008 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.008 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0 |
| K (volatilization factor of Andelman) $L/m^3$ | 0.5 | 0.243371 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{2-6}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{6-16}$ (mutagenic skin surface area) $cm^2$ | 19652 | 0 |
| $SA_{16-26}$ (mutagenic skin surface area) $cm^2$ | 19652 | 3300 |

Output generated 12MAR2020:10:50:25

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res-a}$ (skin surface area - adult) $cm^2$ | 19652 | 3300 |
| $SA_{res-c}$ (skin surface area - child) $cm^2$ | 6365 | 0 |
| $l_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

Output generated 12MAR2020:10:50:25

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water

**Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.**

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$\ (cm/hr) | MW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | 75-35-4 | No | Yes | Organics | - | | - | | 5.00E-02 | I | 2.00E-01 | I | 1 | 1.17E-02 | 96.944 |

| B (unitless) | t* (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event}$ (ca) | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) | Inhalation SL TR=1E-06 (ug/L) | Carcinogenic SL TR=1E-06 (ug/L) | Ingestion SL Child THQ=1 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.43E-02 | 8.81E-01 | 3.67E-01 | 1 | Yes | - | - | 3.69E+00 | 7.00E+00 | - | - | - | - | - |

| Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|
| - | - | - | 2.43E+06 | 1.83E+05 | 6.00E+04 | 4.43E+04 | 4.43E+04 nc |

# Site-specific
# Resident Risk for Tap Water



| Chemical | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW | B (unitless) | t* (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | - | | - | | 5.00E-02 | I | 2.00E-01 | I | 1 | 1.17E-02 | 96.944 | 4.43E-02 | 8.81E-01 |
| *Total Risk/HI* | - | | - | | - | | - | | - | - | - | - | - |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event}$ (ca) | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | 3.67E-01 | 1 | Yes | - | - | 3.69E+00 | 7.00E+00 | 2.50E+00 | - | - | - |
| *Total Risk/HI* | - | - | | - | - | - | - | - | - | - | - |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,1- | - | - | - | - | - | 1.03E-06 | 1.37E-05 | 4.17E-05 | 5.64E-05 |
| *Total Risk/HI* | - | - | - | - | - | *1.03E-06* | *1.37E-05* | *4.17E-05* | *5.64E-05* |

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 0 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 0 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 4950 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 4950 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 1 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 0 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 0 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 0 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 1 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 1 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 0 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 120 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 0 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 0 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 0 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 120 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 120 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 0 |
| $ET_{res}$ (exposure time) hours/day | 24 | 1 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 1 |

Excavation/Maintenance Worker
Upper Aquifer Water Table
cis-1,2-DCE

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 1 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 1 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 1 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 0 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 0 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 0 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 0 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.008 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.008 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0 |
| K (volatilization factor of Andelman) $L/m^3$ | 0.5 | 0.242638 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{2-6}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{6-16}$ (mutagenic skin surface area) $cm^2$ | 19652 | 0 |
| $SA_{16-26}$ (mutagenic skin surface area) $cm^2$ | 19652 | 3300 |

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res-a}$ (skin surface area - adult) $cm^2$ | 19652 | 3300 |
| $SA_{res-c}$ (skin surface area - child) $cm^2$ | 6365 | 0 |
| $I_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

Output generated 12MAR2020:10:55:31

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | 156-59-2 | No | Yes | Organics | - | | - | | 2.00E-03 | I | - | | 1 |

| $K_p$ (cm/hr) | MW | B (unitless) | t* (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event}$ (ca) | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) | Inhalation SL TR=1E-06 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.10E-02 | 96.944 | 4.17E-02 | 8.81E-01 | 3.67E-01 | 1 | Yes | - | - | 1.47E-01 | 7.00E+01 | - | - | - |

| Carcinogenic SL TR=1E-06 (ug/L) | Ingestion SL Child THQ=1 (ug/L) | Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | 9.73E+04 | 7.77E+03 | - | 7.20E+03 | 7.20E+03 nc |

# Site-specific
# Resident Risk for Tap Water

| Chemical | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW | B (unitless) | $t^*$ (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | - | | - | | 2.00E-03 | I | - | | 1 | 1.10E-02 | 96.944 | 4.17E-02 | 8.81E-01 |
| **Total Risk/HI* | - | | - | | - | | - | | - | - | - | - | - |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event}$ (ca) | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | 3.67E-01 | 1 | Yes | - | - | 1.47E-01 | 7.00E+01 | 3.45E+01 | - | - | - |
| **Total Risk/HI* | - | - | | - | - | - | - | - | - | - | - |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | - | - | - | - | - | 3.54E-04 | 4.44E-03 | - | 4.79E-03 |
| **Total Risk/HI* | - | - | - | - | - | *3.54E-04* | *4.44E-03* | - | *4.79E-03* |

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

Excavation/Maintenance Worker
Upper Aquifer Water Table
PCE

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 0 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 0 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 4950 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 4950 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 1 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 0 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 0 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 0 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 1 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 1 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 0 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 120 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 0 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 0 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 0 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 120 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 120 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 0 |
| $ET_{res}$ (exposure time) hours/day | 24 | 1 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 1 |

Output generated 12MAR2020:11:00:08

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 1 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 1 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 1 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 0 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 0 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 0 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 0 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.008 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.008 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0 |
| K (volatilization factor of Andelman) L/m $^3$ | 0.5 | 0.142236 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) cm $^2$ | 6365 | 0 |
| $SA_{2-6}$ (mutagenic skin surface area) cm $^2$ | 6365 | 0 |
| $SA_{6-16}$ (mutagenic skin surface area) cm $^2$ | 19652 | 0 |
| $SA_{16-26}$ (mutagenic skin surface area) cm $^2$ | 19652 | 3300 |

Output generated 12MAR2020:11:00:08

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res\text{-}a}$ (skin surface area - adult) $cm^2$ | 19652 | 3300 |
| $SA_{res\text{-}c}$ (skin surface area - child) $cm^2$ | 6365 | 0 |
| $l_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water

**Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.**

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | 127-18-4 | No | Yes | Organics | 2.10E-03 | I | 2.60E-07 | I | 6.00E-03 | I | 4.00E-02 | I | 1 | 3.34E-02 |

| MW | B (unitless) | $t^*$ (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) | Inhalation SL TR=1E-06 (ug/L) | Carcinogenic SL TR=1E-06 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 165.83 | 1.65E-01 | 2.14E+00 | 8.92E-01 | 1 | Yes | 2.46E+00 | - | 4.42E-01 | 5.00E+00 | 1.52E+06 | 2.82E+04 | 1.38E+05 | 2.31E+04 |

| Ingestion SL Child THQ=1 (ug/L) | Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|---|
| - | - | - | - | 2.92E+05 | 5.07E+03 | 2.05E+04 | 4.01E+03 | 4.01E+03 nc |

Output generated 12MAR2020:11:00:08

# Site-specific
# Resident Risk for Tap Water



| Chemical | $SF_o$ $(mg/kg-day)^{-1}$ | $SF_o$ Ref | IUR $(ug/m^3)^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC $(mg/m^3)$ | RfC Ref | GIABS | $K_p$ (cm/hr) | MW | B (unitless) | t* (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | 2.10E-03 | I | 2.60E-07 | I | 6.00E-03 | I | 4.00E-02 | I | 1 | 3.34E-02 | 165.83 | 1.65E-01 | 2.14E+00 |
| *Total Risk/HI* | - | | - | | - | | - | | - | - | - | - | - |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event (nc\ child)}$ | $DA_{event (nc\ adult)}$ | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | 8.92E-01 | 1 | Yes | 2.46E+00 | - | 4.42E-01 | 5.00E+00 | 3.78E+01 | 2.49E-11 | 1.34E-09 | 2.74E-10 |
| *Total Risk/HI* | - | - | | - | - | - | - | - | *2.49E-11* | *1.34E-09* | *2.74E-10* |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | 1.64E-09 | - | - | - | - | 1.29E-04 | 7.45E-03 | 1.84E-03 | 9.42E-03 |
| *Total Risk/HI* | *1.64E-09* | - | - | - | - | *1.29E-04* | *7.45E-03* | *1.84E-03* | *9.42E-03* |

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

Excavation/Maintenance Worker
Upper Aquifer Water Table
TCE

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 0 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 0 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 4950 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 4950 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 1 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 0 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 0 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 0 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 1 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 1 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 0 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 120 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 0 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 0 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 0 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 120 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 120 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 0 |
| $ET_{res}$ (exposure time) hours/day | 24 | 1 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 1 |

Output generated 12MAR2020:11:02:55

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 1 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 1 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 1 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 0 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 0 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 0 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 0 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.008 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.008 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0 |
| K (volatilization factor of Andelman) $L/m^3$ | 0.5 | 0.179402 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{2-6}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{6-16}$ (mutagenic skin surface area) $cm^2$ | 19652 | 0 |
| $SA_{16-26}$ (mutagenic skin surface area) $cm^2$ | 19652 | 3300 |

Output generated 12MAR2020:11:02:55

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res-a}$ (skin surface area - adult) $cm^2$ | 19652 | 3300 |
| $SA_{res-c}$ (skin surface area - child) $cm^2$ | 6365 | 0 |
| $l_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

Output generated 12MAR2020:11:02:55

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water

**Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.**

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethylene | 79-01-6 | Yes | Yes | Organics | 4.60E-02 | I | 4.10E-06 | I | 5.00E-04 | I | 2.00E-03 | I | 1 | 1.16E-02 | 131.39 |

| B (unitless) | t* (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) | Inhalation SL TR=1E-06 (ug/L) | Carcinogenic SL TR=1E-06 (ug/L) | Ingestion SL Child THQ=1 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.11E-02 | 1.37E+00 | 5.72E-01 | 1 | Yes | 1.12E-01 | - | 3.69E-02 | 5.00E+00 | 6.90E+04 | 4.60E+03 | 6.95E+03 | 2.66E+03 | - |

| Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|
| - | - | - | 2.43E+04 | 1.52E+03 | 8.14E+02 | 5.19E+02 | 5.19E+02 nc |

Output generated 12MAR2020:11:02:55

# Site-specific
# Resident Risk for Tap Water



| Chemical | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW | B (unitless) | t* (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethylene | 4.60E-02 | I | 4.10E-06 | I | 5.00E-04 | I | 2.00E-03 | I | 1 | 1.16E-02 | 131.39 | 5.11E-02 | 1.37E+00 |
| *Total Risk/HI* | - | | - | | - | | - | | - | - | - | - | - |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethylene | 5.72E-01 | 1 | Yes | 1.12E-01 | - | 3.69E-02 | 5.00E+00 | 9.26E+01 | 1.34E-09 | 2.01E-08 | 1.33E-08 |
| *Total Risk/HI* | - | - | | - | - | - | - | - | *1.34E-09* | *2.01E-08* | *1.33E-08* |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Trichloroethylene | 3.48E-08 | - | - | - | - | 3.81E-03 | 6.09E-02 | 1.14E-01 | 1.79E-01 |
| *Total Risk/HI* | *3.48E-08* | - | - | - | - | *3.81E-03* | *6.09E-02* | *1.14E-01* | *1.79E-01* |

Output generated 12MAR2020:11:02:55

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 0 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 0 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 0 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 4950 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 4950 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 1 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 0 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 0 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 0 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 1 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 1 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 0 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 120 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 0 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 0 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 0 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 120 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 120 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 0 |
| $ET_{res}$ (exposure time) hours/day | 24 | 1 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 1 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 1 |

Excavation/Maintenance Worker
Upper Aquifer Water Table
Vinyl chloride

Output generated 12MAR2020:11:05:23

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 1 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 1 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 1 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 0 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 0 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 0 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 0 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.008 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.008 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0 |
| K (volatilization factor of Andelman) $L/m^3$ | 0.5 | 0.377512 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{2-6}$ (mutagenic skin surface area) $cm^2$ | 6365 | 0 |
| $SA_{6-16}$ (mutagenic skin surface area) $cm^2$ | 19652 | 0 |
| $SA_{16-26}$ (mutagenic skin surface area) $cm^2$ | 19652 | 3300 |

Output generated 12MAR2020:11:05:23

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res-a}$ (skin surface area - adult) $cm^2$ | 19652 | 3300 |
| $SA_{res-c}$ (skin surface area - child) $cm^2$ | 6365 | 0 |
| $l_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

Output generated 12MAR2020:11:05:23

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water



Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ $(mg/kg\text{-}day)^{-1}$ | $SF_o$ Ref | IUR $(ug/m^3)^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC $(mg/m^3)$ | RfC Ref | GIABS | $K_p$ (cm/hr) | MW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 75-01-4 | Yes | Yes | Organics | 7.20E-01 | I | 4.40E-06 | I | 3.00E-03 | I | 1.00E-01 | I | 1 | 8.38E-03 | 62.499 |

| B (unitless) | t* (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) | Inhalation SL TR=1E-06 (ug/L) | Carcinogenic SL TR=1E-06 (ug/L) | Ingestion SL Child THQ=1 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.55E-02 | 5.65E-01 | 2.35E-01 | 1 | Yes | 7.17E-03 | - | 2.21E-01 | 2.00E+00 | 4.44E+03 | 5.87E+02 | 6.02E-01 | 6.01E-01 | - |

| Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|
| - | - | - | 1.46E+05 | 1.81E+04 | 1.93E+04 | 8.79E+03 | 6.01E-01 ca |

# Site-specific
# Resident Risk for Tap Water



| Chemical | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW | B (unitless) | t* (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 7.20E-01 | I | 4.40E-06 | I | 3.00E-03 | I | 1.00E-01 | I | 1 | 8.38E-03 | 62.499 | 2.55E-02 | 5.65E-01 |
| **Total Risk/HI* | - | | - | | - | | - | | - | - | - | - | - |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event}$ (nc child) | $DA_{event}$ (nc adult) | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 2.35E-01 | 1 | Yes | 7.17E-03 | - | 2.21E-01 | 2.00E+00 | 5.80E+00 | 1.31E-09 | 9.88E-09 | 9.64E-06 |
| **Total Risk/HI* | - | - | | - | - | - | - | - | *1.31E-09* | *9.88E-09* | *9.64E-06* |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 9.65E-06 | - | - | - | - | 3.97E-05 | 3.20E-04 | 3.00E-04 | 6.60E-04 |
| **Total Risk/HI* | *9.65E-06* | - | - | - | - | *3.97E-05* | *3.20E-04* | *3.00E-04* | *6.60E-04* |

# APPENDIX E
# RISK EVALUATION CALCULATIONS – FOUNTAIN WELL AND IRRIGATION WELL EXPOSURE SCENARIO

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

Fountain Exposure Scenario
August 2018 results
MW57-07

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $BW_{0-2}$ (mutagenic body weight) kg | 15 | 15 |
| $BW_{2-6}$ (mutagenic body weight) kg | 15 | 15 |
| $BW_{6-16}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{16-26}$ (mutagenic body weight) kg | 80 | 80 |
| $BW_{res-a}$ (body weight - adult) kg | 80 | 80 |
| $BW_{res-c}$ (body weight - child) kg | 15 | 15 |
| $DFW_{res-adj}$ (age-adjusted dermal factor) $cm^2$-event/kg | 2610650 | 105659.6 |
| $DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) $cm^2$-event/kg | 8191633 | 347371.2 |
| $ED_{res}$ (exposure duration - resident) years | 26 | 26 |
| $ED_{0-2}$ (mutagenic exposure duration first phase) years | 2 | 2 |
| $ED_{2-6}$ (mutagenic exposure duration second phase) years | 4 | 4 |
| $ED_{6-16}$ (mutagenic exposure duration third phase) years | 10 | 10 |
| $ED_{16-26}$ (mutagenic exposure duration fourth phase) years | 10 | 10 |
| $ED_{res-a}$ (exposure duration - adult) years | 20 | 20 |
| $ED_{res-c}$ (exposure duration - child) years | 6 | 6 |
| $EF_{res}$ (exposure frequency) days/year | 350 | 43 |
| $EF_{0-2}$ (mutagenic exposure frequency first phase) days/year | 350 | 43 |
| $EF_{2-6}$ (mutagenic exposure frequency second phase) days/year | 350 | 43 |
| $EF_{6-16}$ (mutagenic exposure frequency third phase) days/year | 350 | 43 |
| $EF_{16-26}$ (mutagenic exposure frequency fourth phase) days/year | 350 | 43 |
| $EF_{res-a}$ (exposure frequency - adult) days/year | 350 | 43 |
| $EF_{res-c}$ (exposure frequency - child) days/year | 350 | 43 |
| $ET_{res}$ (exposure time) hours/day | 24 | 0.167 |
| $ET_{event-res-adj}$ (age-adjusted exposure time) hours/event | 0.67077 | 0.167 |
| $ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event | 0.67077 | 0.167 |
| $ET_{0-2}$ (mutagenic dermal exposure time first phase) hours/event | 0.54 | 0.167 |
| $ET_{2-6}$ (mutagenic dermal exposure time second phase) hours/event | 0.54 | 0.167 |
| $ET_{6-16}$ (mutagenic dermal exposure time third phase) hours/event | 0.71 | 0.167 |
| $ET_{16-26}$ (mutagenic dermal exposure time fourth phase) hours/event | 0.71 | 0.167 |

Output generated 09APR2020:07:48:24

# Site-specific
# Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $ET_{res-a}$ (dermal exposure time - adult) hours/event | 0.71 | 0.167 |
| $ET_{res-c}$ (dermal exposure time - child) hours/event | 0.54 | 0.167 |
| $ET_{0-2}$ (mutagenic inhalation exposure time first phase) hours/day | 24 | 0.167 |
| $ET_{2-6}$ (mutagenic inhalation exposure time second phase) hours/day | 24 | 0.167 |
| $ET_{6-16}$ (mutagenic inhalation exposure time third phase) hours/day | 24 | 0.167 |
| $ET_{16-26}$ (mutagenic inhalation exposure time fourth phase) hours/day | 24 | 0.167 |
| $ET_{res-a}$ (inhalation exposure time - adult) hours/day | 24 | 0.167 |
| $ET_{res-c}$ (inhalation exposure time - child) hours/day | 24 | 0.167 |
| $EV_{0-2}$ (mutagenic events) per day | 1 | 1 |
| $EV_{2-6}$ (mutagenic events) per day | 1 | 1 |
| $EV_{6-16}$ (mutagenic events) per day | 1 | 1 |
| $EV_{16-26}$ (mutagenic events) per day | 1 | 1 |
| $EV_{res-a}$ (events - adult) per day | 1 | 1 |
| $EV_{res-c}$ (events - child) per day | 1 | 1 |
| THQ (target hazard quotient) unitless | 0.1 | 1 |
| $IFW_{res-adj}$ (adjusted intake factor) L/kg | 327.95 | 0.14 |
| $IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg | 1019.9 | 0.566 |
| $IRW_{0-2}$ (mutagenic water intake rate) L/day | 0.78 | 0.005 |
| $IRW_{2-6}$ (mutagenic water intake rate) L/day | 0.78 | 0.005 |
| $IRW_{6-16}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{16-26}$ (mutagenic water intake rate) L/day | 2.5 | 0.005 |
| $IRW_{res-a}$ (water intake rate - adult) L/day | 2.5 | 0.005 |
| $IRW_{res-c}$ (water intake rate - child) L/day | 0.78 | 0.005 |
| K (volatilization factor of Andelman) $L/m^3$ | 0.5 | 0.03012 |
| LT (lifetime) years | 70 | 70 |
| $SA_{0-2}$ (mutagenic skin surface area) $cm^2$ | 6365 | 2373 |
| $SA_{2-6}$ (mutagenic skin surface area) $cm^2$ | 6365 | 2373 |
| $SA_{6-16}$ (mutagenic skin surface area) $cm^2$ | 19652 | 6032 |
| $SA_{16-26}$ (mutagenic skin surface area) $cm^2$ | 19652 | 6032 |

Output generated 09APR2020:07:48:24

# Site-specific
# Resident Equation Inputs for Tap Water



*** Inputted values different from Resident defaults are highlighted.**

| Variable | Resident Tap Water Default Value | Form-input Value |
|---|---|---|
| $SA_{res-a}$ (skin surface area - adult) $cm^2$ | 19652 | 6032 |
| $SA_{res-c}$ (skin surface area - child) $cm^2$ | 6365 | 2373 |
| $l_{sc}$ (apparent thickness of stratum corneum) cm | 0.001 | 0.001 |
| TR (target risk) unitless | 1.0E-06 | 1.0E-06 |

Output generated 09APR2020:07:48:24

# Site-specific
# Resident Regional Screening Levels (RSL) for Tap Water

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical | CAS Number | Mutagen? | Volatile? | Chemical Type | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | 156-59-2 | No | Yes | Organics | - | | - | | 2.00E-03 | I | - | | 1 | 1.10E-02 | 96.944 |
| Tetrachloroethylene | 127-18-4 | No | Yes | Organics | 2.10E-03 | I | 2.60E-07 | I | 6.00E-03 | I | 4.00E-02 | I | 1 | 3.34E-02 | 165.83 |
| Trichloroethylene | 79-01-6 | Yes | Yes | Organics | 4.60E-02 | I | 4.10E-06 | I | 5.00E-04 | I | 2.00E-03 | I | 1 | 1.16E-02 | 131.39 |
| Vinyl Chloride | 75-01-4 | Yes | Yes | Organics | 7.20E-01 | I | 4.40E-06 | I | 3.00E-03 | I | 1.00E-01 | I | 1 | 8.38E-03 | 62.499 |

| B (unitless) | $t^*$ (hr) | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event (nc\ child)}$ | $DA_{event (nc\ adult)}$ | MCL (ug/L) | Ingestion SL TR=1E-06 (ug/L) | Dermal SL TR=1E-06 (ug/L) | Inhalation SL TR=1E-06 (ug/L) | Carcinogenic SL TR=1E-06 (ug/L) | Ingestion SL Child THQ=1 (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.17E-02 | 8.81E-01 | 3.67E-01 | 1 | Yes | - | 1.07E-01 | 2.25E-01 | 7.00E+01 | - | - | - | - | 5.09E+04 |
| 1.65E-01 | 2.14E+00 | 8.92E-01 | 1 | Yes | 1.15E-01 | 3.22E-01 | 6.75E-01 | 5.00E+00 | 8.69E+04 | 3.23E+03 | 4.19E+05 | 3.09E+03 | 1.53E+05 |
| 5.11E-02 | 1.37E+00 | 5.72E-01 | 1 | Yes | 3.58E-03 | 2.68E-02 | 5.63E-02 | 5.00E+00 | 2.45E+03 | 3.61E+02 | 1.86E+04 | 3.10E+02 | 1.27E+04 |
| 2.55E-02 | 5.65E-01 | 2.35E-01 | 1 | Yes | 8.56E-06 | 1.61E-01 | 3.38E-01 | 2.00E+00 | 4.10E+00 | 1.86E+00 | 7.54E+00 | 1.09E+00 | 7.64E+04 |

| Dermal SL Child THQ=1 (ug/L) | Inhalation SL Child THQ=1 (ug/L) | Noncarcinogenic SL Child THI=1 (ug/L) | Ingestion SL Adult THQ=1 (ug/L) | Dermal SL Adult THQ=1 (ug/L) | Inhalation SL Adult THQ=1 (ug/L) | Noncarcinogenic SL Adult THI=1 (ug/L) | Screening Level (ug/L) |
|---|---|---|---|---|---|---|---|
| 1.43E+04 | - | 1.11E+04 | 2.72E+05 | 2.99E+04 | - | 2.69E+04 | 1.11E+04 nc |
| 9.03E+03 | 1.62E+06 | 8.49E+03 | 8.15E+05 | 1.90E+04 | 1.62E+06 | 1.83E+04 | 3.09E+03 ca** |
| 2.71E+03 | 8.10E+04 | 2.17E+03 | 6.79E+04 | 5.68E+03 | 8.10E+04 | 4.92E+03 | 3.10E+02 ca** |
| 3.50E+04 | 4.05E+06 | 2.39E+04 | 4.07E+05 | 7.35E+04 | 4.05E+06 | 6.14E+04 | 1.09E+00 ca |

Output generated 09APR2020:07:48:24

# Site-specific
# Resident Risk for Tap Water

| Chemical | $SF_o$ (mg/kg-day)$^{-1}$ | $SF_o$ Ref | IUR (ug/m$^3$)$^{-1}$ | IUR Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m$^3$) | RfC Ref | GIABS | $K_p$ (cm/hr) | MW | B (unitless) | $t^*$ (hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | - | | - | | 2.00E-03 | I | - | | 1 | 1.10E-02 | 96.944 | 4.17E-02 | 8.81E-01 |
| Tetrachloroethylene | 2.10E-03 | I | 2.60E-07 | I | 6.00E-03 | I | 4.00E-02 | I | 1 | 3.34E-02 | 165.83 | 1.65E-01 | 2.14E+00 |
| Trichloroethylene | 4.60E-02 | I | 4.10E-06 | I | 5.00E-04 | I | 2.00E-03 | I | 1 | 1.16E-02 | 131.39 | 5.11E-02 | 1.37E+00 |
| Vinyl Chloride | 7.20E-01 | I | 4.40E-06 | I | 3.00E-03 | I | 1.00E-01 | I | 1 | 8.38E-03 | 62.499 | 2.55E-02 | 5.65E-01 |
| **Total Risk/HI* | - | | - | | - | | - | | - | - | - | - | - |

| Chemical | $\tau_{event}$ (hr/event) | FA (unitless) | In EPD? | $DA_{event (ca)}$ | $DA_{event (nc child)}$ | $DA_{event (nc adult)}$ | MCL (ug/L) | Concentration (ug/L) | Ingestion Risk | Dermal Risk | Inhalation Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | 3.67E-01 | 1 | Yes | - | 1.07E-01 | 2.25E-01 | 7.00E+01 | 5.70E+02 | - | - | - |
| Tetrachloroethylene | 8.92E-01 | 1 | Yes | 1.15E-01 | 3.22E-01 | 6.75E-01 | 5.00E+00 | 2.50E+00 | 2.88E-11 | 7.74E-10 | 5.96E-12 |
| Trichloroethylene | 5.72E-01 | 1 | Yes | 3.58E-03 | 2.68E-02 | 5.63E-02 | 5.00E+00 | 5.55E+02 | 2.27E-07 | 1.54E-06 | 2.99E-08 |
| Vinyl Chloride | 2.35E-01 | 1 | Yes | 8.56E-06 | 1.61E-01 | 3.38E-01 | 2.00E+00 | 1.99E+00 | 4.85E-07 | 1.07E-06 | 2.64E-07 |
| **Total Risk/HI* | - | - | | - | - | - | - | - | *7.12E-07* | *2.61E-06* | *2.94E-07* |

| Chemical | Carcinogenic Risk | Ingestion Child HQ | Dermal Child HQ | Inhalation Child HQ | Noncarcinogenic Child HI | Ingestion Adult HQ | Dermal Adult HQ | Inhalation Adult HQ | Noncarcinogenic Adult HI |
|---|---|---|---|---|---|---|---|---|---|
| Dichloroethylene, 1,2-cis- | - | 1.12E-02 | 4.00E-02 | - | 5.12E-02 | 2.10E-03 | 1.91E-02 | - | 2.12E-02 |
| Tetrachloroethylene | 8.08E-10 | 1.64E-05 | 2.77E-04 | 1.54E-06 | 2.95E-04 | 3.07E-06 | 1.32E-04 | 1.54E-06 | 1.37E-04 |
| Trichloroethylene | 1.79E-06 | 4.36E-02 | 2.05E-01 | 6.85E-03 | 2.55E-01 | 8.17E-03 | 9.77E-02 | 6.85E-03 | 1.13E-01 |
| Vinyl Chloride | 1.82E-06 | 2.60E-05 | 5.68E-05 | 4.91E-07 | 8.33E-05 | 4.88E-06 | 2.71E-05 | 4.91E-07 | 3.24E-05 |
| **Total Risk/HI* | *3.61E-06* | *5.48E-02* | *2.45E-01* | *6.85E-03* | *3.07E-01* | *1.03E-02* | *1.17E-01* | *6.85E-03* | *1.34E-01* |

# APPENDIX F
# PRO UCL CALCULATIONS

UCL Statistics for Data Sets with Non-Detects

**East Phase Greenspace EU - 0 to 12 ft bgs**

| | |
|---|---|
| User Selected Options | |
| Date/Time of Computation | ProUCL 5.13/18/2020 8:10:34 AM |
| From File | Greenspace 2018-95ucl-200317.xls |
| Full Precision | OFF |
| Confidence Coefficient | 95% |
| Number of Bootstrap Operations | 2000 |

Tetrachloroethene (mg/kg)

| | | | |
|---|---|---|---|
| General Statistics | | | |
| Total Number of Observations | 54 | Number of Distinct Observations | 45 |
| Number of Detects | 26 | Number of Non-Detects | 28 |
| Number of Distinct Detects | 25 | Number of Distinct Non-Detects | 21 |
| Minimum Detect | 0.0392 | Minimum Non-Detect | 0.0362 |
| Maximum Detect | 252 | Maximum Non-Detect | 0.175 |
| Variance Detects | 2426 | Percent Non-Detects | 51.85% |
| Mean Detects | 10.61 | SD Detects | 49.25 |
| Median Detects | 0.348 | CV Detects | 4.641 |
| Skewness Detects | 5.094 | Kurtosis Detects | 25.96 |
| Mean of Logged Detects | -0.626 | SD of Logged Detects | 1.824 |
| | | | |
| Normal GOF Test on Detects Only | | | |
| Shapiro Wilk Test Statistic | 0.219 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.92 | Detected Data Not Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.51 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.17 | Detected Data Not Normal at 5% Significance Level | |
| Detected Data Not Normal at 5% Significance Level | | | |
| | | | |
| Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs | | | |
| KM Mean | 5.148 | KM Standard Error of Mean | 4.708 |
| KM SD | 33.92 | 95% KM (BCA) UCL | 14.58 |
| 95% KM (t) UCL | 13.03 | 95% KM (Percentile Bootstrap) UCL | 14.46 |
| 95% KM (z) UCL | 12.89 | 95% KM Bootstrap t UCL | 233.8 |
| 90% KM Chebyshev UCL | 19.27 | 95% KM Chebyshev UCL | 25.67 |
| 97.5% KM Chebyshev UCL | 34.55 | 99% KM Chebyshev UCL | 51.99 |
| | | | |
| Gamma GOF Tests on Detected Observations Only | | | |
| A-D Test Statistic | 4.745 | Anderson-Darling GOF Test | |
| 5% A-D Critical Value | 0.882 | Detected Data Not Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.335 | Kolmogorov-Smirnov GOF | |
| 5% K-S Critical Value | 0.188 | Detected Data Not Gamma Distributed at 5% Significance Level | |
| Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| | | | |
| Gamma Statistics on Detected Data Only | | | |
| k hat (MLE) | 0.239 | k star (bias corrected MLE) | 0.237 |
| Theta hat (MLE) | 44.33 | Theta star (bias corrected MLE) | 44.7 |
| nu hat (MLE) | 12.45 | nu star (bias corrected) | 12.35 |
| Mean (detects) | 10.61 | | |
| | | | |
| Gamma ROS Statistics using Imputed Non-Detects | | | |
| GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | |
| GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | |
| For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | |
| This is especially true when the sample size is small. | | | |
| For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | |
| Minimum | 0.01 | Mean | 5.115 |
| Maximum | 252 | Median | 0.01 |
| SD | 34.24 | CV | 6.695 |
| k hat (MLE) | 0.174 | k star (bias corrected MLE) | 0.177 |
| Theta hat (MLE) | 29.4 | Theta star (bias corrected MLE) | 28.95 |
| nu hat (MLE) | 18.79 | nu star (bias corrected) | 19.08 |
| Adjusted Level of Significance (β) | 0.0456 | | |
| Approximate Chi Square Value (19.08, α) | 10.18 | Adjusted Chi Square Value (19.08, β) | 9.997 |
| 95% Gamma Approximate UCL (use when n>=50) | 9.591 | 95% Gamma Adjusted UCL (use when n<50) | 9.763 |
| | | | |
| Estimates of Gamma Parameters using KM Estimates | | | |

| | | | |
|---|---|---|---|
| Mean (KM) | 5.148 | SD (KM) | 33.92 |
| Variance (KM) | 1151 | SE of Mean (KM) | 4.708 |
| k hat (KM) | 0.023 | k star (KM) | 0.0341 |
| nu hat (KM) | 2.488 | nu star (KM) | 3.683 |
| theta hat (KM) | 223.5 | theta star (KM) | 151 |
| 80% gamma percentile (KM) | 0.125 | 90% gamma percentile (KM) | 4.07 |
| 95% gamma percentile (KM) | 22.21 | 99% gamma percentile (KM) | 128.1 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (3.68, α) | 0.601 | Adjusted Chi Square Value (3.68, β) | 0.569 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 31.57 | 95% Gamma Adjusted KM-UCL (use when n<50) | 33.29 |

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.892 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.92 | Detected Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.135 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.17 | Detected Data appear Lognormal at 5% Significance Level |

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 5.131 | Mean in Log Scale | -2.065 |
| SD in Original Scale | 34.24 | SD in Log Scale | 1.946 |
| 95% t UCL (assumes normality of ROS data) | 12.93 | 95% Percentile Bootstrap UCL | 14.43 |
| 95% BCA Bootstrap UCL | 19.34 | 95% Bootstrap t UCL | 234.4 |
| 95% H-UCL (Log ROS) | 2.194 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.707 | KM Geo Mean | 0.181 |
| KM SD (logged) | 1.655 | 95% Critical H Value (KM-Log) | 3.185 |
| KM Standard Error of Mean (logged) | 0.25 | 95% H-UCL (KM -Log) | 1.472 |
| KM SD (logged) | 1.655 | 95% Critical H Value (KM-Log) | 3.185 |
| KM Standard Error of Mean (logged) | 0.25 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 5.144 | Mean in Log Scale | -1.73 |
| SD in Original Scale | 34.24 | SD in Log Scale | 1.661 |
| 95% t UCL (Assumes normality) | 12.94 | 95% H-Stat UCL | 1.458 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| KM H-UCL | 1.472 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene (mg/kg)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 54 | Number of Distinct Observations | 34 |
| Number of Detects | 11 | Number of Non-Detects | 43 |
| Number of Distinct Detects | 11 | Number of Distinct Non-Detects | 24 |
| Minimum Detect | 0.0443 | Minimum Non-Detect | 0.113 |
| Maximum Detect | 5.3 | Maximum Non-Detect | 0.175 |
| Variance Detects | 2.864 | Percent Non-Detects | 79.63% |
| Mean Detects | 1.123 | SD Detects | 1.692 |
| Median Detects | 0.231 | CV Detects | 1.506 |
| Skewness Detects | 1.91 | Kurtosis Detects | 3.199 |
| Mean of Logged Detects | -0.954 | SD of Logged Detects | 1.567 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.697 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.85 | Detected Data Not Normal at 5% Significance Level |

| | | | |
|---|---|---|---|
| Lilliefors Test Statistic | 0.322 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.251 | Detected Data Not Normal at 5% Significance Level | |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.281 | KM Standard Error of Mean | 0.121 |
| KM SD | 0.844 | 95% KM (BCA) UCL | 0.509 |
| 95% KM (t) UCL | 0.484 | 95% KM (Percentile Bootstrap) UCL | 0.495 |
| 95% KM (z) UCL | 0.48 | 95% KM Bootstrap t UCL | 0.964 |
| 90% KM Chebyshev UCL | 0.644 | 95% KM Chebyshev UCL | 0.809 |
| 97.5% KM Chebyshev UCL | 1.037 | 99% KM Chebyshev UCL | 1.485 |

Gamma GOF Tests on Detected Observations Only

| | | | |
|---|---|---|---|
| A-D Test Statistic | 0.658 | Anderson-Darling GOF Test | |
| 5% A-D Critical Value | 0.775 | Detected data appear Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.274 | Kolmogorov-Smirnov GOF | |
| 5% K-S Critical Value | 0.268 | Detected Data Not Gamma Distributed at 5% Significance Level | |

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.58 | k star (bias corrected MLE) | 0.482 |
| Theta hat (MLE) | 1.937 | Theta star (bias corrected MLE) | 2.329 |
| nu hat (MLE) | 12.76 | nu star (bias corrected) | 10.61 |
| Mean (detects) | 1.123 | | |

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 0.237 |
| Maximum | 5.3 | Median | 0.01 |
| SD | 0.863 | CV | 3.645 |
| k hat (MLE) | 0.287 | k star (bias corrected MLE) | 0.283 |
| Theta hat (MLE) | 0.825 | Theta star (bias corrected MLE) | 0.836 |
| nu hat (MLE) | 30.99 | nu star (bias corrected) | 30.6 |
| Adjusted Level of Significance (β) | 0.0456 | | |
| Approximate Chi Square Value (30.60, α) | 18.96 | Adjusted Chi Square Value (30.60, β) | 18.71 |
| 95% Gamma Approximate UCL (use when n>=50) | 0.382 | 95% Gamma Adjusted UCL (use when n<50) | 0.387 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.281 | SD (KM) | 0.844 |
| Variance (KM) | 0.712 | SE of Mean (KM) | 0.121 |
| k hat (KM) | 0.111 | k star (KM) | 0.117 |
| nu hat (KM) | 12.02 | nu star (KM) | 12.68 |
| theta hat (KM) | 2.53 | theta star (KM) | 2.397 |
| 80% gamma percentile (KM) | 0.241 | 90% gamma percentile (KM) | 0.793 |
| 95% gamma percentile (KM) | 1.611 | 99% gamma percentile (KM) | 4.121 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (12.68, α) | 5.679 | Adjusted Chi Square Value (12.68, β) | 5.55 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.629 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.643 |

Lognormal GOF Test on Detected Observations Only

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.936 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.85 | Detected Data appear Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.195 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.251 | Detected Data appear Lognormal at 5% Significance Level | |

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.265 | Mean in Log Scale | -2.808 |
| SD in Original Scale | 0.856 | SD in Log Scale | 1.295 |
| 95% t UCL (assumes normality of ROS data) | 0.46 | 95% Percentile Bootstrap UCL | 0.466 |
| 95% BCA Bootstrap UCL | 0.603 | 95% Bootstrap t UCL | 0.929 |
| 95% H-UCL (Log ROS) | 0.227 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -2.404 | KM Geo Mean | 0.0903 |
| KM SD (logged) | 1.041 | 95% Critical H Value (KM-Log) | 2.372 |
| KM Standard Error of Mean (logged) | 0.231 | 95% H-UCL (KM -Log) | 0.218 |
| KM SD (logged) | 1.041 | 95% Critical H Value (KM-Log) | 2.372 |
| KM Standard Error of Mean (logged) | 0.231 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.282 | Mean in Log Scale | -2.36 |
| SD in Original Scale | 0.852 | SD in Log Scale | 0.992 |
| 95% t UCL (Assumes normality) | 0.476 | 95% H-Stat UCL | 0.212 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| 95% KM Approximate Gamma UCL | 0.629 |

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

**Total PCBs Calculated (mg/kg)**

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 54 | Number of Distinct Observations | 52 |
| Number of Detects | 39 | Number of Non-Detects | 15 |
| Number of Distinct Detects | 39 | Number of Distinct Non-Detects | 13 |
| Minimum Detect | 0.0293 | Minimum Non-Detect | 0.0211 |
| Maximum Detect | 735 | Maximum Non-Detect | 12 |
| Variance Detects | 14207 | Percent Non-Detects | 27.78% |
| Mean Detects | 28.42 | SD Detects | 119.2 |
| Median Detects | 0.364 | CV Detects | 4.193 |
| Skewness Detects | 5.788 | Kurtosis Detects | 34.83 |
| Mean of Logged Detects | -0.425 | SD of Logged Detects | 2.54 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.264 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.939 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.415 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.14 | Detected Data Not Normal at 5% Significance Level |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 20.54 | KM Standard Error of Mean | 13.9 |
| KM SD | 100.8 | 95% KM (BCA) UCL | 48.82 |
| 95% KM (t) UCL | 43.81 | 95% KM (Percentile Bootstrap) UCL | 46.91 |
| 95% KM (z) UCL | 43.4 | 95% KM Bootstrap t UCL | 140.1 |
| 90% KM Chebyshev UCL | 62.23 | 95% KM Chebyshev UCL | 81.11 |
| 97.5% KM Chebyshev UCL | 107.3 | 99% KM Chebyshev UCL | 158.8 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 5.377 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.913 | Detected Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.309 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.157 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.196 | k star (bias corrected MLE) | 0.198 |
| Theta hat (MLE) | 145.2 | Theta star (bias corrected MLE) | 143.7 |
| nu hat (MLE) | 15.27 | nu star (bias corrected) | 15.43 |

| | | | |
|---|---|---|---|
| Mean (detects) | 28.42 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 20.53 |
| Maximum | 735 | Median | 0.151 |
| SD | 101.7 | CV | 4.955 |
| k hat (MLE) | 0.165 | k star (bias corrected MLE) | 0.168 |
| Theta hat (MLE) | 124.8 | Theta star (bias corrected MLE) | 122.4 |
| nu hat (MLE) | 17.77 | nu star (bias corrected) | 18.12 |
| Adjusted Level of Significance (β) | 0.0456 | | |
| Approximate Chi Square Value (18.12, α) | 9.474 | Adjusted Chi Square Value (18.12, β) | 9.302 |
| 95% Gamma Approximate UCL (use when n>=50) | 39.26 | 95% Gamma Adjusted UCL (use when n<50) | 39.98 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 20.54 | SD (KM) | 100.8 |
| Variance (KM) | 10159 | SE of Mean (KM) | 13.9 |
| k hat (KM) | 0.0415 | k star (KM) | 0.0516 |
| nu hat (KM) | 4.487 | nu star (KM) | 5.571 |
| theta hat (KM) | 494.5 | theta star (KM) | 398.3 |
| 80% gamma percentile (KM) | 3.105 | 90% gamma percentile (KM) | 32.63 |
| 95% gamma percentile (KM) | 110.5 | 99% gamma percentile (KM) | 441.4 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (5.57, α) | 1.425 | Adjusted Chi Square Value (5.57, β) | 1.369 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 80.33 | 95% Gamma Adjusted KM-UCL (use when n<50) | 83.62 |

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.881 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.939 | Detected Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.17 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.14 | Detected Data Not Lognormal at 5% Significance Level |

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 20.53 | Mean in Log Scale | -1.908 |
| SD in Original Scale | 101.7 | SD in Log Scale | 3.272 |
| 95% t UCL (assumes normality of ROS data) | 43.71 | 95% Percentile Bootstrap UCL | 47.84 |
| 95% BCA Bootstrap UCL | 66.51 | 95% Bootstrap t UCL | 140.1 |
| 95% H-UCL (Log ROS) | 388 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.345 | KM Geo Mean | 0.26 |
| KM SD (logged) | 2.617 | 95% Critical H Value (KM-Log) | 4.637 |
| KM Standard Error of Mean (logged) | 0.362 | 95% H-UCL (KM -Log) | 42.29 |
| KM SD (logged) | 2.617 | 95% Critical H Value (KM-Log) | 4.637 |
| KM Standard Error of Mean (logged) | 0.362 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 20.64 | Mean in Log Scale | -1.435 |
| SD in Original Scale | 101.7 | SD in Log Scale | 2.832 |
| 95% t UCL (Assumes normality) | 43.82 | 95% H-Stat UCL | 90.27 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| 97.5% KM (Chebyshev) UCL | 107.3 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lead (mg/kg)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 54 | Number of Distinct Observations | 53 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.923 | Mean | 213.1 |
| Maximum | 9670 | Median | 5.41 |
| SD | 1312 | Std. Error of Mean | 178.6 |
| Coefficient of Variation | 6.158 | Skewness | 7.326 |

Normal GOF Test

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.162 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk P Value | 0 | Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.468 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.12 | Data Not Normal at 5% Significance Level |

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

| | | | |
|---|---|---|---|
| 95% Normal UCL | | 95% UCLs (Adjusted for Skewness) | |
| 95% Student's-t UCL | 512.2 | 95% Adjusted-CLT UCL (Chen-1995) | 697.2 |
| | | 95% Modified-t UCL (Johnson-1978) | 541.8 |

Gamma GOF Test

| | | |
|---|---|---|
| A-D Test Statistic | 7.852 | Anderson-Darling Gamma GOF Test |
| 5% A-D Critical Value | 0.894 | Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.263 | Kolmogorov-Smirnov Gamma GOF Test |
| 5% K-S Critical Value | 0.133 | Data Not Gamma Distributed at 5% Significance Level |

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.238 | k star (bias corrected MLE) | 0.237 |
| Theta hat (MLE) | 895 | Theta star (bias corrected MLE) | 898.3 |
| nu hat (MLE) | 25.72 | nu star (bias corrected) | 25.63 |
| MLE Mean (bias corrected) | 213.1 | MLE Sd (bias corrected) | 437.6 |
| | | Approximate Chi Square Value (0.05) | 15.09 |
| Adjusted Level of Significance | 0.0456 | Adjusted Chi Square Value | 14.87 |

Assuming Gamma Distribution

| | | | |
|---|---|---|---|
| 95% Approximate Gamma UCL (use when n>=50)) | 361.9 | 95% Adjusted Gamma UCL (use when n<50) | 367.3 |

Lognormal GOF Test

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.9 | Shapiro Wilk Lognormal GOF Test |
| 5% Shapiro Wilk P Value | 1.22E-04 | Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.153 | Lilliefors Lognormal GOF Test |
| 5% Lilliefors Critical Value | 0.12 | Data Not Lognormal at 5% Significance Level |

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

| | | | |
|---|---|---|---|
| Minimum of Logged Data | -0.0801 | Mean of logged Data | 2.356 |
| Maximum of Logged Data | 9.177 | SD of logged Data | 1.92 |

Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| 95% H-UCL | 169.8 | 90% Chebyshev (MVUE) UCL | 130.6 |
| 95% Chebyshev (MVUE) UCL | 162.2 | 97.5% Chebyshev (MVUE) UCL | 205.9 |
| 99% Chebyshev (MVUE) UCL | 291.9 | | |

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

| | | | |
|---|---|---|---|
| 95% CLT UCL | 506.9 | 95% Jackknife UCL | 512.2 |
| 95% Standard Bootstrap UCL | 509.1 | 95% Bootstrap-t UCL | 5876 |
| 95% Hall's Bootstrap UCL | 2870 | 95% Percentile Bootstrap UCL | 570.7 |
| 95% BCA Bootstrap UCL | 756.2 | | |
| 90% Chebyshev(Mean, Sd) UCL | 749 | 95% Chebyshev(Mean, Sd) UCL | 991.7 |

| | | | |
|---|---|---|---|
| 97.5% Chebyshev(Mean, Sd) UCL | 1329 | 99% Chebyshev(Mean, Sd) UCL | 1990 |

| | |
|---|---|
| Suggested UCL to Use | |
| 95% Chebyshev (Mean, Sd) UCL | 991.7 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

**East Phase Greenspace EU - Surface (0-4 ft bgs) + Subsurface (>4 - 12 ft bgs)**

| | |
|---|---|
| User Selected Options | |
| Date/Time of Computation | ProUCL 5.13/18/2020 8:11:31 AM |
| From File | Greenspace 2018-95ucl-200317.xls |
| Full Precision | OFF |
| Confidence Coefficient | 95% |
| Number of Bootstrap Operations | 2000 |

Tetrachloroethene (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 47 | Number of Distinct Observations | 42 |
| Number of Detects | 22 | Number of Non-Detects | 25 |
| Number of Distinct Detects | 22 | Number of Distinct Non-Detects | 21 |
| Minimum Detect | 0.0392 | Minimum Non-Detect | 0.0362 |
| Maximum Detect | 252 | Maximum Non-Detect | 0.175 |
| Variance Detects | 2864 | Percent Non-Detects | 53.19% |
| Mean Detects | 12.48 | SD Detects | 53.51 |
| Median Detects | 0.348 | CV Detects | 4.288 |
| Skewness Detects | 4.686 | Kurtosis Detects | 21.97 |
| Mean of Logged Detects | -0.533 | SD of Logged Detects | 1.966 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.238 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.911 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.513 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.184 | Detected Data Not Normal at 5% Significance Level |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 5.88 | KM Standard Error of Mean | 5.42 |
| KM SD | 36.3 | 95% KM (BCA) UCL | 16.67 |
| 95% KM (t) UCL | 14.98 | 95% KM (Percentile Bootstrap) UCL | 16.54 |
| 95% KM (z) UCL | 14.8 | 95% KM Bootstrap t UCL | 265.8 |
| 90% KM Chebyshev UCL | 22.14 | 95% KM Chebyshev UCL | 29.51 |
| 97.5% KM Chebyshev UCL | 39.73 | 99% KM Chebyshev UCL | 59.81 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 3.714 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.88 | Detected Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.345 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.204 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.235 | k star (bias corrected MLE) | 0.233 |
| Theta hat (MLE) | 53.16 | Theta star (bias corrected MLE) | 53.55 |
| nu hat (MLE) | 10.33 | nu star (bias corrected) | 10.25 |
| Mean (detects) | 12.48 | | |

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 5.846 |
| Maximum | 252 | Median | 0.01 |
| SD | 36.7 | CV | 6.277 |
| k hat (MLE) | 0.169 | k star (bias corrected MLE) | 0.173 |
| Theta hat (MLE) | 34.57 | Theta star (bias corrected MLE) | 33.89 |
| nu hat (MLE) | 15.9 | nu star (bias corrected) | 16.22 |
| Adjusted Level of Significance (β) | 0.0449 | | |
| Approximate Chi Square Value (16.22, α) | 8.115 | Adjusted Chi Square Value (16.22, β) | 7.933 |
| 95% Gamma Approximate UCL (use when n>=50) | 11.68 | 95% Gamma Adjusted UCL (use when n<50) | 11.95 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 5.88 | SD (KM) | 36.3 |

| | | | |
|---|---|---|---|
| Variance (KM) | 1318 | SE of Mean (KM) | 5.42 |
| k hat (KM) | 0.0262 | k star (KM) | 0.0387 |
| nu hat (KM) | 2.466 | nu star (KM) | 3.642 |
| theta hat (KM) | 224.1 | theta star (KM) | 151.8 |
| 80% gamma percentile (KM) | 0.278 | 90% gamma percentile (KM) | 6.019 |
| 95% gamma percentile (KM) | 27.68 | 99% gamma percentile (KM) | 140.5 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (3.64, α) | 0.586 | Adjusted Chi Square Value (3.64, β) | 0.551 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 36.57 | 95% Gamma Adjusted KM-UCL (use when n<50) | 38.9 |
| 95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50) | | | |

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.902 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.911 | Detected Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.144 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.184 | Detected Data appear Lognormal at 5% Significance Level |

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 5.863 | Mean in Log Scale | -2.034 |
| SD in Original Scale | 36.7 | SD in Log Scale | 2.014 |
| 95% t UCL (assumes normality of ROS data) | 14.85 | 95% Percentile Bootstrap UCL | 16.58 |
| 95% BCA Bootstrap UCL | 22.28 | 95% Bootstrap t UCL | 268.7 |
| 95% H-UCL (Log ROS) | 2.903 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.693 | KM Geo Mean | 0.184 |
| KM SD (logged) | 1.74 | 95% Critical H Value (KM-Log) | 3.236 |
| KM Standard Error of Mean (logged) | 0.279 | 95% H-UCL (KM -Log) | 1.918 |
| KM SD (logged) | 1.74 | 95% Critical H Value (KM-Log) | 3.236 |
| KM Standard Error of Mean (logged) | 0.279 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 5.876 | Mean in Log Scale | -1.719 |
| SD in Original Scale | 36.7 | SD in Log Scale | 1.752 |
| 95% t UCL (Assumes normality) | 14.86 | 95% H-Stat UCL | 1.926 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

| | |
|---|---|
| 95% KM (Chebyshev) UCL | 29.51 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Tetrachloroethene (mg/kg) (surface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 7 | Number of Distinct Observations | 7 |
| Number of Detects | 4 | Number of Non-Detects | 3 |
| Number of Distinct Detects | 4 | Number of Distinct Non-Detects | 3 |
| Minimum Detect | 0.174 | Minimum Non-Detect | 0.128 |
| Maximum Detect | 0.49 | Maximum Non-Detect | 0.142 |
| Variance Detects | 0.0256 | Percent Non-Detects | 42.86% |
| Mean Detects | 0.351 | SD Detects | 0.16 |
| Median Detects | 0.37 | CV Detects | 0.456 |
| Skewness Detects | -0.226 | Kurtosis Detects | -4.693 |
| Mean of Logged Detects | -1.137 | SD of Logged Detects | 0.507 |

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.846 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.748 | Detected Data appear Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.295 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.375 | Detected Data appear Normal at 5% Significance Level | |

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.255 | KM Standard Error of Mean | 0.0664 |
| KM SD | 0.152 | 95% KM (BCA) UCL | N/A |
| 95% KM (t) UCL | 0.385 | 95% KM (Percentile Bootstrap) UCL | N/A |
| 95% KM (z) UCL | 0.365 | 95% KM Bootstrap t UCL | N/A |
| 90% KM Chebyshev UCL | 0.455 | 95% KM Chebyshev UCL | 0.545 |
| 97.5% KM Chebyshev UCL | 0.67 | 99% KM Chebyshev UCL | 0.916 |

Gamma GOF Tests on Detected Observations Only

| | | | |
|---|---|---|---|
| A-D Test Statistic | 0.447 | Anderson-Darling GOF Test | |
| 5% A-D Critical Value | 0.659 | Detected data appear Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.327 | Kolmogorov-Smirnov GOF | |
| 5% K-S Critical Value | 0.396 | Detected data appear Gamma Distributed at 5% Significance Level | |

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 5.708 | k star (bias corrected MLE) | 1.594 |
| Theta hat (MLE) | 0.0615 | Theta star (bias corrected MLE) | 0.22 |
| nu hat (MLE) | 45.66 | nu star (bias corrected) | 12.75 |
| Mean (detects) | 0.351 | | |

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 0.205 |
| Maximum | 0.49 | Median | 0.174 |
| SD | 0.215 | CV | 1.047 |
| k hat (MLE) | 0.596 | k star (bias corrected MLE) | 0.436 |
| Theta hat (MLE) | 0.344 | Theta star (bias corrected MLE) | 0.47 |
| nu hat (MLE) | 8.342 | nu star (bias corrected) | 6.1 |
| Adjusted Level of Significance (β) | 0.0158 | | |
| Approximate Chi Square Value (6.10, α) | 1.691 | Adjusted Chi Square Value (6.10, β) | 1.085 |
| 95% Gamma Approximate UCL (use when n>=50) | 0.739 | 95% Gamma Adjusted UCL (use when n<50) | N/A |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.255 | SD (KM) | 0.152 |
| Variance (KM) | 0.0232 | SE of Mean (KM) | 0.0664 |
| k hat (KM) | 2.816 | k star (KM) | 1.705 |
| nu hat (KM) | 39.43 | nu star (KM) | 23.86 |
| theta hat (KM) | 0.0907 | theta star (KM) | 0.15 |
| 80% gamma percentile (KM) | 0.39 | 90% gamma percentile (KM) | 0.516 |
| 95% gamma percentile (KM) | 0.638 | 99% gamma percentile (KM) | 0.911 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (23.86, α) | 13.75 | Adjusted Chi Square Value (23.86, β) | 11.5 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.443 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.53 |

Lognormal GOF Test on Detected Observations Only

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.867 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.748 | Detected Data appear Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.29 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.375 | Detected Data appear Lognormal at 5% Significance Level | |

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.235 | Mean in Log Scale | -1.735 |
| SD in Original Scale | 0.184 | SD in Log Scale | 0.827 |
| 95% t UCL (assumes normality of ROS data) | 0.37 | 95% Percentile Bootstrap UCL | 0.34 |

| | | | |
|---|---|---|---|
| 95% BCA Bootstrap UCL | 0.351 | 95% Bootstrap t UCL | 0.457 |
| 95% H-UCL (Log ROS) | 0.738 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.531 | KM Geo Mean | 0.216 |
| KM SD (logged) | 0.563 | 95% Critical H Value (KM-Log) | 2.593 |
| KM Standard Error of Mean (logged) | 0.246 | 95% H-UCL (KM -Log) | 0.46 |
| KM SD (logged) | 0.563 | 95% Critical H Value (KM-Log) | 2.593 |
| KM Standard Error of Mean (logged) | 0.246 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.23 | Mean in Log Scale | -1.805 |
| SD in Original Scale | 0.189 | SD in Log Scale | 0.908 |
| 95% t UCL (Assumes normality) | 0.368 | 95% H-Stat UCL | 0.889 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| 95% KM (t) UCL | 0.385 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 47 | Number of Distinct Observations | 33 |
| Number of Detects | 10 | Number of Non-Detects | 37 |
| Number of Distinct Detects | 10 | Number of Distinct Non-Detects | 24 |
| Minimum Detect | 0.0811 | Minimum Non-Detect | 0.113 |
| Maximum Detect | 5.3 | Maximum Non-Detect | 0.175 |
| Variance Detects | 3.04 | Percent Non-Detects | 78.72% |
| Mean Detects | 1.231 | SD Detects | 1.744 |
| Median Detects | 0.268 | CV Detects | 1.416 |
| Skewness Detects | 1.786 | Kurtosis Detects | 2.672 |
| Mean of Logged Detects | -0.738 | SD of Logged Detects | 1.469 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.722 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.842 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.302 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.262 | Detected Data Not Normal at 5% Significance Level |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.328 | KM Standard Error of Mean | 0.138 |
| KM SD | 0.896 | 95% KM (BCA) UCL | 0.614 |
| 95% KM (t) UCL | 0.559 | 95% KM (Percentile Bootstrap) UCL | 0.571 |
| 95% KM (z) UCL | 0.555 | 95% KM Bootstrap t UCL | 0.991 |
| 90% KM Chebyshev UCL | 0.741 | 95% KM Chebyshev UCL | 0.929 |
| 97.5% KM Chebyshev UCL | 1.188 | 99% KM Chebyshev UCL | 1.699 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 0.653 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.765 | Detected data appear Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.28 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.278 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.646 | k star (bias corrected MLE) | 0.519 |
| Theta hat (MLE) | 1.906 | Theta star (bias corrected MLE) | 2.374 |
| nu hat (MLE) | 12.92 | nu star (bias corrected) | 10.38 |
| Mean (detects) | 1.231 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 0.27 |
| Maximum | 5.3 | Median | 0.01 |
| SD | 0.922 | CV | 3.416 |
| k hat (MLE) | 0.282 | k star (bias corrected MLE) | 0.278 |
| Theta hat (MLE) | 0.958 | Theta star (bias corrected MLE) | 0.971 |
| nu hat (MLE) | 26.48 | nu star (bias corrected) | 26.13 |
| Adjusted Level of Significance (β) | 0.0449 | | |
| Approximate Chi Square Value (26.13, α) | 15.48 | Adjusted Chi Square Value (26.13, β) | 15.22 |
| 95% Gamma Approximate UCL (use when n>=50) | 0.456 | 95% Gamma Adjusted UCL (use when n<50) | 0.463 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.328 | SD (KM) | 0.896 |
| Variance (KM) | 0.803 | SE of Mean (KM) | 0.138 |
| k hat (KM) | 0.134 | k star (KM) | 0.14 |
| nu hat (KM) | 12.6 | nu star (KM) | 13.13 |
| theta hat (KM) | 2.448 | theta star (KM) | 2.349 |
| 80% gamma percentile (KM) | 0.336 | 90% gamma percentile (KM) | 0.962 |
| 95% gamma percentile (KM) | 1.829 | 99% gamma percentile (KM) | 4.385 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (13.13, α) | 5.978 | Adjusted Chi Square Value (13.13, β) | 5.825 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.72 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.739 |

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.909 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.842 | Detected Data appear Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.22 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.262 | Detected Data appear Lognormal at 5% Significance Level |

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.289 | Mean in Log Scale | -2.955 |
| SD in Original Scale | 0.917 | SD in Log Scale | 1.439 |
| 95% t UCL (assumes normality of ROS data) | 0.513 | 95% Percentile Bootstrap UCL | 0.527 |
| 95% BCA Bootstrap UCL | 0.601 | 95% Bootstrap t UCL | 1.025 |
| 95% H-UCL (Log ROS) | 0.268 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -2.114 | KM Geo Mean | 0.121 |
| KM SD (logged) | 0.966 | 95% Critical H Value (KM-Log) | 2.296 |
| KM Standard Error of Mean (logged) | 0.15 | 95% H-UCL (KM -Log) | 0.267 |
| KM SD (logged) | 0.966 | 95% Critical H Value (KM-Log) | 2.296 |
| KM Standard Error of Mean (logged) | 0.15 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.314 | Mean in Log Scale | -2.297 |
| SD in Original Scale | 0.909 | SD in Log Scale | 1.048 |
| 95% t UCL (Assumes normality) | 0.537 | 95% H-Stat UCL | 0.252 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

| | |
|---|---|
| Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 5 | 0.739 |

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene (mg/kg) (surface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 7 | Number of Distinct Observations | 6 |
| Number of Detects | 1 | Number of Non-Detects | 6 |
| Number of Distinct Detects | 1 | Number of Distinct Non-Detects | 5 |

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Trichloroethene (mg/kg) (surface) was not processed!

Total PCBs Calculated (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 47 | Number of Distinct Observations | 47 |
| Number of Detects | 35 | Number of Non-Detects | 12 |
| Number of Distinct Detects | 35 | Number of Distinct Non-Detects | 12 |
| Minimum Detect | 0.0293 | Minimum Non-Detect | 0.0211 |
| Maximum Detect | 735 | Maximum Non-Detect | 12 |
| Variance Detects | 15778 | Percent Non-Detects | 25.53% |
| Mean Detects | 31.58 | SD Detects | 125.6 |
| Median Detects | 0.373 | CV Detects | 3.977 |
| Skewness Detects | 5.483 | Kurtosis Detects | 31.25 |
| Mean of Logged Detects | -0.333 | SD of Logged Detects | 2.622 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.279 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.934 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.404 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.148 | Detected Data Not Normal at 5% Significance Level |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 23.54 | KM Standard Error of Mean | 15.94 |
| KM SD | 107.7 | 95% KM (BCA) UCL | 57.44 |
| 95% KM (t) UCL | 50.3 | 95% KM (Percentile Bootstrap) UCL | 53.78 |
| 95% KM (z) UCL | 49.76 | 95% KM Bootstrap t UCL | 163.8 |
| 90% KM Chebyshev UCL | 71.36 | 95% KM Chebyshev UCL | 93.02 |
| 97.5% KM Chebyshev UCL | 123.1 | 99% KM Chebyshev UCL | 182.2 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 4.586 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.912 | Detected Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.299 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.165 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.195 | k star (bias corrected MLE) | 0.197 |
| Theta hat (MLE) | 161.8 | Theta star (bias corrected MLE) | 159.9 |
| nu hat (MLE) | 13.66 | nu star (bias corrected) | 13.82 |
| Mean (detects) | 31.58 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 23.52 |
| Maximum | 735 | Median | 0.153 |
| SD | 108.9 | CV | 4.629 |
| k hat (MLE) | 0.165 | k star (bias corrected MLE) | 0.169 |
| Theta hat (MLE) | 142.2 | Theta star (bias corrected MLE) | 139.2 |

| | | | |
|---|---|---|---|
| nu hat (MLE) | 15.54 | nu star (bias corrected) | 15.89 |
| Adjusted Level of Significance (β) | 0.0449 | | |
| Approximate Chi Square Value (15.89, α) | 7.881 | Adjusted Chi Square Value (15.89, β) | 7.702 |
| 95% Gamma Approximate UCL (use when n>=50) | 47.41 | 95% Gamma Adjusted UCL (use when n<50) | 48.51 |
| | | | |
| Estimates of Gamma Parameters using KM Estimates | | | |
| Mean (KM) | 23.54 | SD (KM) | 107.7 |
| Variance (KM) | 11603 | SE of Mean (KM) | 15.94 |
| k hat (KM) | 0.0477 | k star (KM) | 0.0589 |
| nu hat (KM) | 4.488 | nu star (KM) | 5.535 |
| theta hat (KM) | 493 | theta star (KM) | 399.7 |
| 80% gamma percentile (KM) | 5.385 | 90% gamma percentile (KM) | 43.44 |
| 95% gamma percentile (KM) | 131.4 | 99% gamma percentile (KM) | 478.7 |
| | | | |
| Gamma Kaplan-Meier (KM) Statistics | | | |
| Approximate Chi Square Value (5.53, α) | 1.407 | Adjusted Chi Square Value (5.53, β) | 1.343 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 92.59 | 95% Gamma Adjusted KM-UCL (use when n<50) | 97 |
| 95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50) | | | |
| | | | |
| Lognormal GOF Test on Detected Observations Only | | | |
| Shapiro Wilk Test Statistic | 0.883 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.934 | Detected Data Not Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.163 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.148 | Detected Data Not Lognormal at 5% Significance Level | |
| Detected Data Not Lognormal at 5% Significance Level | | | |
| | | | |
| Lognormal ROS Statistics Using Imputed Non-Detects | | | |
| Mean in Original Scale | 23.52 | Mean in Log Scale | -1.71 |
| SD in Original Scale | 108.9 | SD in Log Scale | 3.316 |
| 95% t UCL (assumes normality of ROS data) | 50.18 | 95% Percentile Bootstrap UCL | 53.44 |
| 95% BCA Bootstrap UCL | 75.08 | 95% Bootstrap t UCL | 162.2 |
| 95% H-UCL (Log ROS) | 655.1 | | |
| | | | |
| Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | |
| KM Mean (logged) | -1.193 | KM Geo Mean | 0.303 |
| KM SD (logged) | 2.694 | 95% Critical H Value (KM-Log) | 4.585 |
| KM Standard Error of Mean (logged) | 0.4 | 95% H-UCL (KM -Log) | 70.54 |
| KM SD (logged) | 2.694 | 95% Critical H Value (KM-Log) | 4.585 |
| KM Standard Error of Mean (logged) | 0.4 | | |
| | | | |
| DL/2 Statistics | | | |
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 23.65 | Mean in Log Scale | -1.255 |
| SD in Original Scale | 108.9 | SD in Log Scale | 2.898 |
| 95% t UCL (Assumes normality) | 50.3 | 95% H-Stat UCL | 153.3 |
| DL/2 is not a recommended method, provided for comparisons and historical reasons | | | |
| | | | |
| Nonparametric Distribution Free UCL Statistics | | | |
| Data do not follow a Discernible Distribution at 5% Significance Level | | | |
| | | | |
| Suggested UCL to Use | | | |
| 97.5% KM (Chebyshev) UCL | 123.1 | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Total PCBs Calculated (mg/kg) (surface)

| | | | |
|---|---|---|---|
| General Statistics | | | |
| Total Number of Observations | 7 | Number of Distinct Observations | 7 |
| Number of Detects | 4 | Number of Non-Detects | 3 |
| Number of Distinct Detects | 4 | Number of Distinct Non-Detects | 3 |
| Minimum Detect | 0.0482 | Minimum Non-Detect | 0.0213 |
| Maximum Detect | 2.59 | Maximum Non-Detect | 0.0219 |
| Variance Detects | 1.457 | Percent Non-Detects | 42.86% |
| Mean Detects | 0.79 | SD Detects | 1.207 |
| Median Detects | 0.262 | CV Detects | 1.527 |

| | | | |
|---|---|---|---|
| Skewness Detects | 1.931 | Kurtosis Detects | 3.759 |
| Mean of Logged Detects | -1.233 | SD of Logged Detects | 1.676 |

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.726 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.748 | Detected Data Not Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.388 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.375 | Detected Data Not Normal at 5% Significance Level | |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.461 | KM Standard Error of Mean | 0.383 |
| KM SD | 0.877 | 95% KM (BCA) UCL | N/A |
| 95% KM (t) UCL | 1.204 | 95% KM (Percentile Bootstrap) UCL | N/A |
| 95% KM (z) UCL | 1.09 | 95% KM Bootstrap t UCL | N/A |
| 90% KM Chebyshev UCL | 1.609 | 95% KM Chebyshev UCL | 2.129 |
| 97.5% KM Chebyshev UCL | 2.851 | 99% KM Chebyshev UCL | 4.269 |

Gamma GOF Tests on Detected Observations Only

| | | | |
|---|---|---|---|
| A-D Test Statistic | 0.349 | Anderson-Darling GOF Test | |
| 5% A-D Critical Value | 0.676 | Detected data appear Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.287 | Kolmogorov-Smirnov GOF | |
| 5% K-S Critical Value | 0.408 | Detected data appear Gamma Distributed at 5% Significance Level | |

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.617 | k star (bias corrected MLE) | 0.321 |
| Theta hat (MLE) | 1.281 | Theta star (bias corrected MLE) | 2.463 |
| nu hat (MLE) | 4.936 | nu star (bias corrected) | 2.567 |
| Mean (detects) | 0.79 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 0.456 |
| Maximum | 2.59 | Median | 0.0482 |
| SD | 0.95 | CV | 2.084 |
| k hat (MLE) | 0.355 | k star (bias corrected MLE) | 0.298 |
| Theta hat (MLE) | 1.286 | Theta star (bias corrected MLE) | 1.531 |
| nu hat (MLE) | 4.964 | nu star (bias corrected) | 4.17 |
| Adjusted Level of Significance (β) | 0.0158 | | |
| Approximate Chi Square Value (4.17, α) | 0.79 | Adjusted Chi Square Value (4.17, β) | 0.444 |
| 95% Gamma Approximate UCL (use when n>=50) | 2.406 | 95% Gamma Adjusted UCL (use when n<50) | N/A |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.461 | SD (KM) | 0.877 |
| Variance (KM) | 0.769 | SE of Mean (KM) | 0.383 |
| k hat (KM) | 0.276 | k star (KM) | 0.253 |
| nu hat (KM) | 3.864 | nu star (KM) | 3.541 |
| theta hat (KM) | 1.669 | theta star (KM) | 1.821 |
| 80% gamma percentile (KM) | 0.672 | 90% gamma percentile (KM) | 1.382 |
| 95% gamma percentile (KM) | 2.222 | 99% gamma percentile (KM) | 4.456 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (3.54, α) | 0.549 | Adjusted Chi Square Value (3.54, β) | 0.292 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 2.97 | 95% Gamma Adjusted KM-UCL (use when n<50) | 5.587 |

Lognormal GOF Test on Detected Observations Only

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.982 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.748 | Detected Data appear Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.197 | Lilliefors GOF Test | |

| | | | |
|---|---|---|---|
| 5% Lilliefors Critical Value | 0.375 | Detected Data appear Lognormal at 5% Significance Level | |
| Detected Data appear Lognormal at 5% Significance Level | | | |

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.452 | Mean in Log Scale | -3.368 |
| SD in Original Scale | 0.952 | SD in Log Scale | 2.915 |
| 95% t UCL (assumes normality of ROS data) | 1.151 | 95% Percentile Bootstrap UCL | 1.124 |
| 95% BCA Bootstrap UCL | 1.214 | 95% Bootstrap t UCL | 7.251 |
| 95% H-UCL (Log ROS) | 239707 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -2.354 | KM Geo Mean | 0.095 |
| KM SD (logged) | 1.697 | 95% Critical H Value (KM-Log) | 5.795 |
| KM Standard Error of Mean (logged) | 0.741 | 95% H-UCL (KM -Log) | 22.23 |
| KM SD (logged) | 1.697 | 95% Critical H Value (KM-Log) | 5.795 |
| KM Standard Error of Mean (logged) | 0.741 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.456 | Mean in Log Scale | -2.644 |
| SD in Original Scale | 0.95 | SD in Log Scale | 2.122 |
| 95% t UCL (Assumes normality) | 1.154 | 95% H-Stat UCL | 325.7 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Level

| | | | |
|---|---|---|---|
| Suggested UCL to Use | | | |
| 95% KM Bootstrap t UCL | N/A | Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 5 | 5.587 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lead (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 47 | Number of Distinct Observations | 46 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.923 | Mean | 242 |
| Maximum | 9670 | Median | 5.24 |
| SD | 1406 | Std. Error of Mean | 205.2 |
| Coefficient of Variation | 5.813 | Skewness | 6.835 |

Normal GOF Test

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.172 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.946 | Data Not Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.47 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.128 | Data Not Normal at 5% Significance Level | |
| Data Not Normal at 5% Significance Level | | | |

Assuming Normal Distribution

| | | | |
|---|---|---|---|
| 95% Normal UCL | | 95% UCLs (Adjusted for Skewness) | |
| 95% Student's-t UCL | 586.4 | 95% Adjusted-CLT UCL (Chen-1995) | 798 |
| | | 95% Modified-t UCL (Johnson-1978) | 620.4 |

Gamma GOF Test

| | | | |
|---|---|---|---|
| A-D Test Statistic | 6.834 | Anderson-Darling Gamma GOF Test | |
| 5% A-D Critical Value | 0.897 | Data Not Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.26 | Kolmogorov-Smirnov Gamma GOF Test | |
| 5% K-S Critical Value | 0.143 | Data Not Gamma Distributed at 5% Significance Level | |
| Data Not Gamma Distributed at 5% Significance Level | | | |

Gamma Statistics

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.229 | k star (bias corrected MLE) | 0.229 |
| Theta hat (MLE) | 1056 | Theta star (bias corrected MLE) | 1058 |
| nu hat (MLE) | 21.54 | nu star (bias corrected) | 21.5 |

| | | | |
|---|---|---|---|
| MLE Mean (bias corrected) | 242 | MLE Sd (bias corrected) | 505.9 |
| | | Approximate Chi Square Value (0.05) | 11.96 |
| Adjusted Level of Significance | 0.0449 | Adjusted Chi Square Value | 11.74 |

Assuming Gamma Distribution

| | | | |
|---|---|---|---|
| 95% Approximate Gamma UCL (use when n>=50)) | 434.8 | 95% Adjusted Gamma UCL (use when n<50) | 443.2 |

Lognormal GOF Test

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.885 | Shapiro Wilk Lognormal GOF Test |
| 5% Shapiro Wilk Critical Value | 0.946 | Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.162 | Lilliefors Lognormal GOF Test |
| 5% Lilliefors Critical Value | 0.128 | Data Not Lognormal at 5% Significance Level |

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

| | | | |
|---|---|---|---|
| Minimum of Logged Data | -0.0801 | Mean of logged Data | 2.346 |
| Maximum of Logged Data | 9.177 | SD of logged Data | 2.022 |

Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| 95% H-UCL | 237.2 | 90% Chebyshev (MVUE) UCL | 163.4 |
| 95% Chebyshev (MVUE) UCL | 205.1 | 97.5% Chebyshev (MVUE) UCL | 262.8 |
| 99% Chebyshev (MVUE) UCL | 376.3 | | |

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

| | | | |
|---|---|---|---|
| 95% CLT UCL | 579.4 | 95% Jackknife UCL | 586.4 |
| 95% Standard Bootstrap UCL | 573.9 | 95% Bootstrap-t UCL | 6598 |
| 95% Hall's Bootstrap UCL | 3217 | 95% Percentile Bootstrap UCL | 650.6 |
| 95% BCA Bootstrap UCL | 862.7 | | |
| 90% Chebyshev(Mean, Sd) UCL | 857.4 | 95% Chebyshev(Mean, Sd) UCL | 1136 |
| 97.5% Chebyshev(Mean, Sd) UCL | 1523 | 99% Chebyshev(Mean, Sd) UCL | 2283 |

Suggested UCL to Use

| | |
|---|---|
| 97.5% Chebyshev (Mean, Sd) UCL | 1523 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lead (mg/kg) (surface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 7 | Number of Distinct Observations | 7 |
| | | Number of Missing Observations | 0 |
| Minimum | 3.47 | Mean | 19.61 |
| Maximum | 56 | Median | 8.07 |
| SD | 22.12 | Std. Error of Mean | 8.359 |
| Coefficient of Variation | 1.128 | Skewness | 1.213 |

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.738 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.803 | Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.335 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.304 | Data Not Normal at 5% Significance Level |

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

| | | | |
|---|---|---|---|
| 95% Normal UCL | | 95% UCLs (Adjusted for Skewness) | |
| 95% Student's-t UCL | 35.86 | 95% Adjusted-CLT UCL (Chen-1995) | 37.46 |
| | | 95% Modified-t UCL (Johnson-1978) | 36.49 |

| | | | |
|---|---|---|---|
| Gamma GOF Test | | | |
| A-D Test Statistic | 0.652 | Anderson-Darling Gamma GOF Test | |
| 5% A-D Critical Value | 0.727 | Detected data appear Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.243 | Kolmogorov-Smirnov Gamma GOF Test | |
| 5% K-S Critical Value | 0.319 | Detected data appear Gamma Distributed at 5% Significance Level | |
| Detected data appear Gamma Distributed at 5% Significance Level | | | |
| | | | |
| Gamma Statistics | | | |
| k hat (MLE) | 1.044 | k star (bias corrected MLE) | 0.692 |
| Theta hat (MLE) | 18.78 | Theta star (bias corrected MLE) | 28.34 |
| nu hat (MLE) | 14.62 | nu star (bias corrected) | 9.688 |
| MLE Mean (bias corrected) | 19.61 | MLE Sd (bias corrected) | 23.58 |
| | | Approximate Chi Square Value (0.05) | 3.748 |
| Adjusted Level of Significance | 0.0158 | Adjusted Chi Square Value | 2.72 |
| | | | |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (use when n>=50) | 50.7 | 95% Adjusted Gamma UCL (use when n<50) | 69.85 |
| | | | |
| Lognormal GOF Test | | | |
| Shapiro Wilk Test Statistic | 0.872 | Shapiro Wilk Lognormal GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.803 | Data appear Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.191 | Lilliefors Lognormal GOF Test | |
| 5% Lilliefors Critical Value | 0.304 | Data appear Lognormal at 5% Significance Level | |
| Data appear Lognormal at 5% Significance Level | | | |
| | | | |
| Lognormal Statistics | | | |
| Minimum of Logged Data | 1.244 | Mean of logged Data | 2.426 |
| Maximum of Logged Data | 4.025 | SD of logged Data | 1.112 |
| | | | |
| Assuming Lognormal Distribution | | | |
| 95% H-UCL | 130.4 | 90% Chebyshev (MVUE) UCL | 42.17 |
| 95% Chebyshev (MVUE) UCL | 52.83 | 97.5% Chebyshev (MVUE) UCL | 67.62 |
| 99% Chebyshev (MVUE) UCL | 96.68 | | |
| | | | |
| Nonparametric Distribution Free UCL Statistics | | | |
| Data appear to follow a Discernible Distribution at 5% Significance Level | | | |
| | | | |
| Nonparametric Distribution Free UCLs | | | |
| 95% CLT UCL | 33.36 | 95% Jackknife UCL | 35.86 |
| 95% Standard Bootstrap UCL | 32.07 | 95% Bootstrap-t UCL | 105.9 |
| 95% Hall's Bootstrap UCL | 134.1 | 95% Percentile Bootstrap UCL | 32.69 |
| 95% BCA Bootstrap UCL | 34.38 | | |
| 90% Chebyshev(Mean, Sd) UCL | 44.69 | 95% Chebyshev(Mean, Sd) UCL | 56.05 |
| 97.5% Chebyshev(Mean, Sd) UCL | 71.81 | 99% Chebyshev(Mean, Sd) UCL | 102.8 |
| | | | |
| Suggested UCL to Use | | | |
| 95% Adjusted Gamma UCL | 69.85 | | |

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

**East Phase Greenspace EU - Surface (0-2 ft bgs) + Subsurface (>2-12 ft bgs)**

| | |
|---|---|
| User Selected Options | |
| Date/Time of Computation | ProUCL 5.13/18/2020 8:14:07 AM |
| From File | Greenspace 2018-95ucl-200317.xls |
| Full Precision | OFF |
| Confidence Coefficient | 95% |
| Number of Bootstrap Operations | 2000 |

Tetrachloroethene (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 49 | Number of Distinct Observations | 43 |
| Number of Detects | 23 | Number of Non-Detects | 26 |
| Number of Distinct Detects | 23 | Number of Distinct Non-Detects | 21 |
| Minimum Detect | 0.0392 | Minimum Non-Detect | 0.0362 |
| Maximum Detect | 252 | Maximum Non-Detect | 0.175 |
| Variance Detects | 2740 | Percent Non-Detects | 53.06% |
| Mean Detects | 11.94 | SD Detects | 52.35 |
| Median Detects | 0.335 | CV Detects | 4.383 |
| Skewness Detects | 4.791 | Kurtosis Detects | 22.97 |
| Mean of Logged Detects | -0.585 | SD of Logged Detects | 1.938 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.233 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.914 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.512 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.18 | Detected Data Not Normal at 5% Significance Level |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 5.645 | KM Standard Error of Mean | 5.196 |
| KM SD | 35.57 | 95% KM (BCA) UCL | 15.97 |
| 95% KM (t) UCL | 14.36 | 95% KM (Percentile Bootstrap) UCL | 15.86 |
| 95% KM (z) UCL | 14.19 | 95% KM Bootstrap t UCL | 264.1 |
| 90% KM Chebyshev UCL | 21.23 | 95% KM Chebyshev UCL | 28.29 |
| 97.5% KM Chebyshev UCL | 38.09 | 99% KM Chebyshev UCL | 57.34 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 3.971 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.881 | Detected Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.341 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.2 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.234 | k star (bias corrected MLE) | 0.233 |
| Theta hat (MLE) | 51.01 | Theta star (bias corrected MLE) | 51.35 |
| nu hat (MLE) | 10.77 | nu star (bias corrected) | 10.7 |
| Mean (detects) | 11.94 | | |

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 5.612 |
| Maximum | 252 | Median | 0.01 |
| SD | 35.95 | CV | 6.406 |
| k hat (MLE) | 0.17 | k star (bias corrected MLE) | 0.173 |
| Theta hat (MLE) | 33.04 | Theta star (bias corrected MLE) | 32.43 |
| nu hat (MLE) | 16.64 | nu star (bias corrected) | 16.96 |
| Adjusted Level of Significance (β) | 0.0451 | | |
| Approximate Chi Square Value (16.96, α) | 8.642 | Adjusted Chi Square Value (16.96, β) | 8.462 |
| 95% Gamma Approximate UCL (use when n>=50) | 11.01 | 95% Gamma Adjusted UCL (use when n<50) | 11.25 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 5.645 | SD (KM) | 35.57 |
| Variance (KM) | 1265 | SE of Mean (KM) | 5.196 |
| k hat (KM) | 0.0252 | k star (KM) | 0.0372 |
| nu hat (KM) | 2.468 | nu star (KM) | 3.65 |
| theta hat (KM) | 224.2 | theta star (KM) | 151.6 |
| 80% gamma percentile (KM) | 0.22 | 90% gamma percentile (KM) | 5.361 |
| 95% gamma percentile (KM) | 25.93 | 99% gamma percentile (KM) | 136.7 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (3.65, α) | 0.589 | Adjusted Chi Square Value (3.65, β) | 0.555 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 35.01 | 95% Gamma Adjusted KM-UCL (use when n<50) | 37.14 |

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.897 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.914 | Detected Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.154 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.18 | Detected Data appear Lognormal at 5% Significance Level |

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 5.627 | Mean in Log Scale | -2.078 |
| SD in Original Scale | 35.94 | SD in Log Scale | 2 |
| 95% t UCL (assumes normality of ROS data) | 14.24 | 95% Percentile Bootstrap UCL | 15.85 |
| 95% BCA Bootstrap UCL | 21.18 | 95% Bootstrap t UCL | 267.1 |
| 95% H-UCL (Log ROS) | 2.621 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.714 | KM Geo Mean | 0.18 |
| KM SD (logged) | 1.711 | 95% Critical H Value (KM-Log) | 3.213 |
| KM Standard Error of Mean (logged) | 0.27 | 95% H-UCL (KM -Log) | 1.723 |
| KM SD (logged) | 1.711 | 95% Critical H Value (KM-Log) | 3.213 |
| KM Standard Error of Mean (logged) | 0.27 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 5.641 | Mean in Log Scale | -1.738 |
| SD in Original Scale | 35.94 | SD in Log Scale | 1.72 |
| 95% t UCL (Assumes normality) | 14.25 | 95% H-Stat UCL | 1.718 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| 95% KM (Chebyshev) UCL | 28.29 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Tetrachloroethene (mg/kg) (surface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 5 | Number of Distinct Observations | 5 |
| Number of Detects | 3 | Number of Non-Detects | 2 |
| Number of Distinct Detects | 3 | Number of Distinct Non-Detects | 2 |
| Minimum Detect | 0.257 | Minimum Non-Detect | 0.128 |
| Maximum Detect | 0.49 | Maximum Non-Detect | 0.135 |
| Variance Detects | 0.0176 | Percent Non-Detects | 40% |
| Mean Detects | 0.41 | SD Detects | 0.133 |
| Median Detects | 0.483 | CV Detects | 0.323 |
| Skewness Detects | -1.727 | Kurtosis Detects | N/A |
| Mean of Logged Detects | -0.933 | SD of Logged Detects | 0.368 |

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.772 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.767 | Detected Data appear Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.376 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.425 | Detected Data appear Normal at 5% Significance Level |

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.297 | KM Standard Error of Mean | 0.0885 |
| KM SD | 0.162 | 95% KM (BCA) UCL | N/A |
| 95% KM (t) UCL | 0.486 | 95% KM (Percentile Bootstrap) UCL | N/A |

| | | | |
|---|---|---|---|
| 95% KM (z) UCL | 0.443 | 95% KM Bootstrap t UCL | N/A |
| 90% KM Chebyshev UCL | 0.563 | 95% KM Chebyshev UCL | 0.683 |
| 97.5% KM Chebyshev UCL | 0.85 | 99% KM Chebyshev UCL | 1.178 |

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 12.17 | k star (bias corrected MLE) | N/A |
| Theta hat (MLE) | 0.0337 | Theta star (bias corrected MLE) | N/A |
| nu hat (MLE) | 73 | nu star (bias corrected) | N/A |
| Mean (detects) | 0.41 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.112 | Mean | 0.291 |
| Maximum | 0.49 | Median | 0.257 |
| SD | 0.188 | CV | 0.647 |
| k hat (MLE) | 2.653 | k star (bias corrected MLE) | 1.194 |
| Theta hat (MLE) | 0.11 | Theta star (bias corrected MLE) | 0.244 |
| nu hat (MLE) | 26.53 | nu star (bias corrected) | 11.94 |
| Adjusted Level of Significance (β) | 0.0086 | | |
| Approximate Chi Square Value (11.94, α) | 5.191 | Adjusted Chi Square Value (11.94, β) | 3.428 |
| 95% Gamma Approximate UCL (use when n>=50) | 0.669 | 95% Gamma Adjusted UCL (use when n<50) | N/A |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.297 | SD (KM) | 0.162 |
| Variance (KM) | 0.0261 | SE of Mean (KM) | 0.0885 |
| k hat (KM) | 3.382 | k star (KM) | 1.486 |
| nu hat (KM) | 33.82 | nu star (KM) | 14.86 |
| theta hat (KM) | 0.0879 | theta star (KM) | 0.2 |
| 80% gamma percentile (KM) | 0.46 | 90% gamma percentile (KM) | 0.621 |
| 95% gamma percentile (KM) | 0.777 | 99% gamma percentile (KM) | 1.129 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (14.86, α) | 7.167 | Adjusted Chi Square Value (14.86, β) | 5.008 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.616 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.882 |

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.767 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.767 | Detected Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.378 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.425 | Detected Data appear Lognormal at 5% Significance Level |

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.307 | Mean in Log Scale | -1.313 |
| SD in Original Scale | 0.17 | SD in Log Scale | 0.582 |
| 95% t UCL (assumes normality of ROS data) | 0.468 | 95% Percentile Bootstrap UCL | N/A |
| 95% BCA Bootstrap UCL | N/A | 95% Bootstrap t UCL | N/A |
| 95% H-UCL (Log ROS) | 0.814 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.382 | KM Geo Mean | 0.251 |
| KM SD (logged) | 0.597 | 95% Critical H Value (KM-Log) | 3.277 |
| KM Standard Error of Mean (logged) | 0.327 | 95% H-UCL (KM -Log) | 0.798 |
| KM SD (logged) | 0.597 | 95% Critical H Value (KM-Log) | 3.277 |
| KM Standard Error of Mean (logged) | 0.327 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.272 | Mean in Log Scale | -1.649 |
| SD in Original Scale | 0.211 | SD in Log Scale | 1.014 |
| 95% t UCL (Assumes normality) | 0.473 | 95% H-Stat UCL | 3.988 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

| | |
|---|---|
| 95% KM (t) UCL | 0.486 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 49 | Number of Distinct Observations | 33 |
| Number of Detects | 10 | Number of Non-Detects | 39 |
| Number of Distinct Detects | 10 | Number of Distinct Non-Detects | 24 |
| Minimum Detect | 0.0811 | Minimum Non-Detect | 0.113 |
| Maximum Detect | 5.3 | Maximum Non-Detect | 0.175 |
| Variance Detects | 3.04 | Percent Non-Detects | 79.59% |
| Mean Detects | 1.231 | SD Detects | 1.744 |
| Median Detects | 0.268 | CV Detects | 1.416 |
| Skewness Detects | 1.786 | Kurtosis Detects | 2.672 |
| Mean of Logged Detects | -0.738 | SD of Logged Detects | 1.469 |

Normal GOF Test on Detects Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.722 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.842 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.302 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.262 | Detected Data Not Normal at 5% Significance Level |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.318 | KM Standard Error of Mean | 0.132 |
| KM SD | 0.879 | 95% KM (BCA) UCL | 0.571 |
| 95% KM (t) UCL | 0.54 | 95% KM (Percentile Bootstrap) UCL | 0.56 |
| 95% KM (z) UCL | 0.536 | 95% KM Bootstrap t UCL | 1.137 |
| 90% KM Chebyshev UCL | 0.715 | 95% KM Chebyshev UCL | 0.895 |
| 97.5% KM Chebyshev UCL | 1.145 | 99% KM Chebyshev UCL | 1.635 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 0.653 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.765 | Detected data appear Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.28 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.278 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.646 | k star (bias corrected MLE) | 0.519 |
| Theta hat (MLE) | 1.906 | Theta star (bias corrected MLE) | 2.374 |
| nu hat (MLE) | 12.92 | nu star (bias corrected) | 10.38 |
| Mean (detects) | 1.231 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 0.259 |
| Maximum | 5.3 | Median | 0.01 |
| SD | 0.904 | CV | 3.487 |
| k hat (MLE) | 0.282 | k star (bias corrected MLE) | 0.279 |
| Theta hat (MLE) | 0.918 | Theta star (bias corrected MLE) | 0.93 |
| nu hat (MLE) | 27.67 | nu star (bias corrected) | 27.31 |
| Adjusted Level of Significance (β) | 0.0451 | | |
| Approximate Chi Square Value (27.31, α) | 16.39 | Adjusted Chi Square Value (27.31, β) | 16.14 |
| 95% Gamma Approximate UCL (use when n>=50) | 0.432 | 95% Gamma Adjusted UCL (use when n<50) | 0.439 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.318 | SD (KM) | 0.879 |
| Variance (KM) | 0.772 | SE of Mean (KM) | 0.132 |
| k hat (KM) | 0.131 | k star (KM) | 0.137 |
| nu hat (KM) | 12.84 | nu star (KM) | 13.39 |
| theta hat (KM) | 2.428 | theta star (KM) | 2.329 |
| 80% gamma percentile (KM) | 0.319 | 90% gamma percentile (KM) | 0.929 |
| 95% gamma percentile (KM) | 1.781 | 99% gamma percentile (KM) | 4.303 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (13.39, α) | 6.153 | Adjusted Chi Square Value (13.39, β) | 6.004 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.692 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.709 |

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.909 | Shapiro Wilk GOF Test |

| | | | |
|---|---|---|---|
| 5% Shapiro Wilk Critical Value | 0.842 | Detected Data appear Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.22 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.262 | Detected Data appear Lognormal at 5% Significance Level | |

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.279 | Mean in Log Scale | -2.979 |
| SD in Original Scale | 0.899 | SD in Log Scale | 1.428 |
| 95% t UCL (assumes normality of ROS data) | 0.494 | 95% Percentile Bootstrap UCL | 0.521 |
| 95% BCA Bootstrap UCL | 0.643 | 95% Bootstrap t UCL | 0.991 |
| 95% H-UCL (Log ROS) | 0.253 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -2.128 | KM Geo Mean | 0.119 |
| KM SD (logged) | 0.949 | 95% Critical H Value (KM-Log) | 2.286 |
| KM Standard Error of Mean (logged) | 0.145 | 95% H-UCL (KM -Log) | 0.256 |
| KM SD (logged) | 0.949 | 95% Critical H Value (KM-Log) | 2.286 |
| KM Standard Error of Mean (logged) | 0.145 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.304 | Mean in Log Scale | -2.313 |
| SD in Original Scale | 0.892 | SD in Log Scale | 1.029 |
| 95% t UCL (Assumes normality) | 0.518 | 95% H-Stat UCL | 0.239 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 5 | 0.709 |

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene (mg/kg) (surface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 5 | Number of Distinct Observations | 5 |
| Number of Detects | 1 | Number of Non-Detects | 4 |
| Number of Distinct Detects | 1 | Number of Distinct Non-Detects | 4 |

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Trichloroethene (mg/kg) (surface) was not processed!

Total PCBs Calculated (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 49 | Number of Distinct Observations | 49 |
| Number of Detects | 37 | Number of Non-Detects | 12 |
| Number of Distinct Detects | 37 | Number of Distinct Non-Detects | 12 |
| Minimum Detect | 0.0293 | Minimum Non-Detect | 0.0211 |
| Maximum Detect | 735 | Maximum Non-Detect | 12 |
| Variance Detects | 14949 | Percent Non-Detects | 24.49% |
| Mean Detects | 29.95 | SD Detects | 122.3 |
| Median Detects | 0.373 | CV Detects | 4.082 |
| Skewness Detects | 5.638 | Kurtosis Detects | 33.04 |
| Mean of Logged Detects | -0.339 | SD of Logged Detects | 2.57 |

Normal GOF Test on Detects Only

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.271 | Shapiro Wilk GOF Test | |
| 5% Shapiro Wilk Critical Value | 0.936 | Detected Data Not Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.41 | Lilliefors GOF Test | |
| 5% Lilliefors Critical Value | 0.144 | Detected Data Not Normal at 5% Significance Level | |

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 22.63 | KM Standard Error of Mean | 15.29 |
| KM SD | 105.6 | 95% KM (BCA) UCL | 52.5 |

| | | | |
|---|---|---|---|
| 95% KM (t) UCL | 48.28 | 95% KM (Percentile Bootstrap) UCL | 52.22 |
| 95% KM (z) UCL | 47.79 | 95% KM Bootstrap t UCL | 152 |
| 90% KM Chebyshev UCL | 68.51 | 95% KM Chebyshev UCL | 89.29 |
| 97.5% KM Chebyshev UCL | 118.1 | 99% KM Chebyshev UCL | 174.8 |

Gamma GOF Tests on Detected Observations Only

| | | |
|---|---|---|
| A-D Test Statistic | 4.895 | Anderson-Darling GOF Test |
| 5% A-D Critical Value | 0.911 | Detected Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.306 | Kolmogorov-Smirnov GOF |
| 5% K-S Critical Value | 0.161 | Detected Data Not Gamma Distributed at 5% Significance Level |

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.197 | k star (bias corrected MLE) | 0.199 |
| Theta hat (MLE) | 151.8 | Theta star (bias corrected MLE) | 150.3 |
| nu hat (MLE) | 14.6 | nu star (bias corrected) | 14.75 |
| Mean (detects) | 29.95 | | |

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

| | | | |
|---|---|---|---|
| Minimum | 0.01 | Mean | 22.62 |
| Maximum | 735 | Median | 0.154 |
| SD | 106.7 | CV | 4.717 |
| k hat (MLE) | 0.168 | k star (bias corrected MLE) | 0.171 |
| Theta hat (MLE) | 134.7 | Theta star (bias corrected MLE) | 132.1 |
| nu hat (MLE) | 16.45 | nu star (bias corrected) | 16.78 |
| Adjusted Level of Significance (β) | 0.0451 | | |
| Approximate Chi Square Value (16.78, α) | 8.515 | Adjusted Chi Square Value (16.78, β) | 8.335 |
| 95% Gamma Approximate UCL (use when n>=50) | 44.57 | 95% Gamma Adjusted UCL (use when n<50) | 45.53 |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 22.63 | SD (KM) | 105.6 |
| Variance (KM) | 11148 | SE of Mean (KM) | 15.29 |
| k hat (KM) | 0.0459 | k star (KM) | 0.0567 |
| nu hat (KM) | 4.503 | nu star (KM) | 5.56 |
| theta hat (KM) | 492.6 | theta star (KM) | 398.9 |
| 80% gamma percentile (KM) | 4.642 | 90% gamma percentile (KM) | 40.17 |
| 95% gamma percentile (KM) | 125.2 | 99% gamma percentile (KM) | 467.6 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| Approximate Chi Square Value (5.56, α) | 1.42 | Adjusted Chi Square Value (5.56, β) | 1.358 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 88.65 | 95% Gamma Adjusted KM-UCL (use when n<50) | 92.68 |

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.887 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.936 | Detected Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.16 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.144 | Detected Data Not Lognormal at 5% Significance Level |

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 22.62 | Mean in Log Scale | -1.628 |
| SD in Original Scale | 106.7 | SD in Log Scale | 3.231 |
| 95% t UCL (assumes normality of ROS data) | 48.18 | 95% Percentile Bootstrap UCL | 52.71 |
| 95% BCA Bootstrap UCL | 67.63 | 95% Bootstrap t UCL | 155.4 |
| 95% H-UCL (Log ROS) | 454 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -1.161 | KM Geo Mean | 0.313 |
| KM SD (logged) | 2.657 | 95% Critical H Value (KM-Log) | 4.558 |
| KM Standard Error of Mean (logged) | 0.386 | 95% H-UCL (KM -Log) | 61.41 |
| KM SD (logged) | 2.657 | 95% Critical H Value (KM-Log) | 4.558 |
| KM Standard Error of Mean (logged) | 0.386 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 22.74 | Mean in Log Scale | -1.222 |
| SD in Original Scale | 106.7 | SD in Log Scale | 2.856 |
| 95% t UCL (Assumes normality) | 48.3 | 95% H-Stat UCL | 128.6 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

| | |
|---|---|
| Suggested UCL to Use | |
| 97.5% KM (Chebyshev) UCL | 118.1 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Total PCBs Calculated (mg/kg) (surface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 5 | Number of Distinct Observations | 5 |
| Number of Detects | 2 | Number of Non-Detects | 3 |
| Number of Distinct Detects | 2 | Number of Distinct Non-Detects | 3 |
| Minimum Detect | 0.0482 | Minimum Non-Detect | 0.0213 |
| Maximum Detect | 0.364 | Maximum Non-Detect | 0.0219 |
| Variance Detects | 0.0499 | Percent Non-Detects | 60% |
| Mean Detects | 0.206 | SD Detects | 0.223 |
| Median Detects | 0.206 | CV Detects | 1.083 |
| Skewness Detects | N/A | Kurtosis Detects | N/A |
| Mean of Logged Detects | -2.021 | SD of Logged Detects | 1.43 |

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

| | | | |
|---|---|---|---|
| KM Mean | 0.0952 | KM Standard Error of Mean | 0.0853 |
| KM SD | 0.135 | 95% KM (BCA) UCL | N/A |
| 95% KM (t) UCL | 0.277 | 95% KM (Percentile Bootstrap) UCL | N/A |
| 95% KM (z) UCL | 0.235 | 95% KM Bootstrap t UCL | N/A |
| 90% KM Chebyshev UCL | 0.351 | 95% KM Chebyshev UCL | 0.467 |
| 97.5% KM Chebyshev UCL | 0.628 | 99% KM Chebyshev UCL | 0.943 |

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

| | | | |
|---|---|---|---|
| k hat (MLE) | 1.272 | k star (bias corrected MLE) | N/A |
| Theta hat (MLE) | 0.162 | Theta star (bias corrected MLE) | N/A |
| nu hat (MLE) | 5.087 | nu star (bias corrected) | N/A |
| Mean (detects) | 0.206 | | |

Estimates of Gamma Parameters using KM Estimates

| | | | |
|---|---|---|---|
| Mean (KM) | 0.0952 | SD (KM) | 0.135 |
| Variance (KM) | 0.0182 | SE of Mean (KM) | 0.0853 |
| k hat (KM) | 0.499 | k star (KM) | 0.333 |
| nu hat (KM) | 4.99 | nu star (KM) | 3.329 |
| theta hat (KM) | 0.191 | theta star (KM) | 0.286 |
| 80% gamma percentile (KM) | 0.149 | 90% gamma percentile (KM) | 0.277 |
| 95% gamma percentile (KM) | 0.421 | 99% gamma percentile (KM) | 0.791 |

Gamma Kaplan-Meier (KM) Statistics

| | | | |
|---|---|---|---|
| | | Adjusted Level of Significance (β) | 0.0086 |
| Approximate Chi Square Value (3.33, α) | 0.476 | Adjusted Chi Square Value (3.33, β) | 0.181 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.666 | 95% Gamma Adjusted KM-UCL (use when n<50) | 1.747 |

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

| | | | |
|---|---|---|---|
| Mean in Original Scale | 0.0827 | Mean in Log Scale | -5.481 |
| SD in Original Scale | 0.159 | SD in Log Scale | 3.238 |
| 95% t UCL (assumes normality of ROS data) | 0.234 | 95% Percentile Bootstrap UCL | N/A |
| 95% BCA Bootstrap UCL | N/A | 95% Bootstrap t UCL | N/A |
| 95% H-UCL (Log ROS) | 3.08E+10 | | |

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| KM Mean (logged) | -3.118 | KM Geo Mean | 0.0442 |
| KM SD (logged) | 1.1 | 95% Critical H Value (KM-Log) | 5.339 |
| KM Standard Error of Mean (logged) | 0.696 | 95% H-UCL (KM -Log) | 1.528 |
| KM SD (logged) | 1.1 | 95% Critical H Value (KM-Log) | 5.339 |
| KM Standard Error of Mean (logged) | 0.696 | | |

DL/2 Statistics

| | | | |
|---|---|---|---|
| DL/2 Normal | | DL/2 Log-Transformed | |
| Mean in Original Scale | 0.0889 | Mean in Log Scale | -3.524 |
| SD in Original Scale | 0.155 | SD in Log Scale | 1.546 |
| 95% t UCL (Assumes normality) | 0.236 | 95% H-Stat UCL | 28.2 |

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

| | |
|---|---|
| 95% KM (Chebyshev) UCL | 0.467 |

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lead (mg/kg) (subsurface)

General Statistics

| | | | |
|---|---|---|---|
| Total Number of Observations | 49 | Number of Distinct Observations | 48 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.923 | Mean | 233.2 |
| Maximum | 9670 | Median | 5.58 |
| SD | 1378 | Std. Error of Mean | 196.8 |
| Coefficient of Variation | 5.907 | Skewness | 6.979 |

Normal GOF Test

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.169 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.947 | Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.47 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.126 | Data Not Normal at 5% Significance Level |

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

| | | | |
|---|---|---|---|
| 95% Normal UCL | | 95% UCLs (Adjusted for Skewness) | |
| 95% Student's-t UCL | 563.3 | 95% Adjusted-CLT UCL (Chen-1995) | 766.5 |
| | | 95% Modified-t UCL (Johnson-1978) | 596 |

Gamma GOF Test

| | | |
|---|---|---|
| A-D Test Statistic | 7.023 | Anderson-Darling Gamma GOF Test |
| 5% A-D Critical Value | 0.895 | Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.262 | Kolmogorov-Smirnov Gamma GOF Test |
| 5% K-S Critical Value | 0.14 | Data Not Gamma Distributed at 5% Significance Level |

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.233 | k star (bias corrected MLE) | 0.232 |
| Theta hat (MLE) | 1000 | Theta star (bias corrected MLE) | 1003 |
| nu hat (MLE) | 22.85 | nu star (bias corrected) | 22.78 |
| MLE Mean (bias corrected) | 233.2 | MLE Sd (bias corrected) | 483.7 |
| | | Approximate Chi Square Value (0.05) | 12.93 |
| Adjusted Level of Significance | 0.0451 | Adjusted Chi Square Value | 12.7 |

Assuming Gamma Distribution

| | | | |
|---|---|---|---|
| 95% Approximate Gamma UCL (use when n>=50)) | 411 | 95% Adjusted Gamma UCL (use when n<50) | 418.3 |

Lognormal GOF Test

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.893 | Shapiro Wilk Lognormal GOF Test |
| 5% Shapiro Wilk Critical Value | 0.947 | Data Not Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.146 | Lilliefors Lognormal GOF Test |
| 5% Lilliefors Critical Value | 0.126 | Data Not Lognormal at 5% Significance Level |

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

| | | | |
|---|---|---|---|
| Minimum of Logged Data | -0.0801 | Mean of logged Data | 2.371 |
| Maximum of Logged Data | 9.177 | SD of logged Data | 1.991 |

| | | | |
|---|---|---|---|
| Assuming Lognormal Distribution | | | |
| 95% H-UCL | 218.7 | 90% Chebyshev (MVUE) UCL | 156.2 |
| 95% Chebyshev (MVUE) UCL | 195.3 | 97.5% Chebyshev (MVUE) UCL | 249.7 |
| 99% Chebyshev (MVUE) UCL | 356.5 | | |

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

| | | | |
|---|---|---|---|
| Nonparametric Distribution Free UCLs | | | |
| 95% CLT UCL | 556.9 | 95% Jackknife UCL | 563.3 |
| 95% Standard Bootstrap UCL | 558.6 | 95% Bootstrap-t UCL | 6624 |
| 95% Hall's Bootstrap UCL | 3098 | 95% Percentile Bootstrap UCL | 623 |
| 95% BCA Bootstrap UCL | 1017 | | |
| 90% Chebyshev(Mean, Sd) UCL | 823.6 | 95% Chebyshev(Mean, Sd) UCL | 1091 |
| 97.5% Chebyshev(Mean, Sd) UCL | 1462 | 99% Chebyshev(Mean, Sd) UCL | 2191 |

| | |
|---|---|
| Suggested UCL to Use | |
| 95% Chebyshev (Mean, Sd) UCL | 1091 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lead (mg/kg) (surface)

| | | | |
|---|---|---|---|
| General Statistics | | | |
| Total Number of Observations | 5 | Number of Distinct Observations | 5 |
| | | Number of Missing Observations | 0 |
| Minimum | 3.47 | Mean | 16.46 |
| Maximum | 56 | Median | 5.11 |
| SD | 22.4 | Std. Error of Mean | 10.02 |
| Coefficient of Variation | 1.361 | Skewness | 2.097 |

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

| | | |
|---|---|---|
| Normal GOF Test | | |
| Shapiro Wilk Test Statistic | 0.675 | Shapiro Wilk GOF Test |
| 5% Shapiro Wilk Critical Value | 0.762 | Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.365 | Lilliefors GOF Test |
| 5% Lilliefors Critical Value | 0.343 | Data Not Normal at 5% Significance Level |
| Data Not Normal at 5% Significance Level | | |

| | | | |
|---|---|---|---|
| Assuming Normal Distribution | | | |
| 95% Normal UCL | | 95% UCLs (Adjusted for Skewness) | |
| 95% Student's-t UCL | 37.82 | 95% Adjusted-CLT UCL (Chen-1995) | 42.98 |
| | | 95% Modified-t UCL (Johnson-1978) | 39.39 |

| | | |
|---|---|---|
| Gamma GOF Test | | |
| A-D Test Statistic | 0.628 | Anderson-Darling Gamma GOF Test |
| 5% A-D Critical Value | 0.692 | Detected data appear Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.328 | Kolmogorov-Smirnov Gamma GOF Test |
| 5% K-S Critical Value | 0.365 | Detected data appear Gamma Distributed at 5% Significance Level |
| Detected data appear Gamma Distributed at 5% Significance Level | | |

| | | | |
|---|---|---|---|
| Gamma Statistics | | | |
| k hat (MLE) | 0.978 | k star (bias corrected MLE) | 0.525 |
| Theta hat (MLE) | 16.83 | Theta star (bias corrected MLE) | 31.39 |
| nu hat (MLE) | 9.781 | nu star (bias corrected) | 5.246 |
| MLE Mean (bias corrected) | 16.46 | MLE Sd (bias corrected) | 22.73 |
| | | Approximate Chi Square Value (0.05) | 1.267 |
| Adjusted Level of Significance | 0.0086 | Adjusted Chi Square Value | 0.603 |

| | | | |
|---|---|---|---|
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (use when n>=50) | 68.14 | 95% Adjusted Gamma UCL (use when n<50) | 143.1 |

| | | |
|---|---|---|
| Lognormal GOF Test | | |
| Shapiro Wilk Test Statistic | 0.855 | Shapiro Wilk Lognormal GOF Test |
| 5% Shapiro Wilk Critical Value | 0.762 | Data appear Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.297 | Lilliefors Lognormal GOF Test |
| 5% Lilliefors Critical Value | 0.343 | Data appear Lognormal at 5% Significance Level |
| Data appear Lognormal at 5% Significance Level | | |

Lognormal Statistics

| | | | |
|---|---|---|---|
| Minimum of Logged Data | 1.244 | Mean of logged Data | 2.21 |
| Maximum of Logged Data | 4.025 | SD of logged Data | 1.124 |

Assuming Lognormal Distribution

| | | | |
|---|---|---|---|
| 95% H-UCL | 365.3 | 90% Chebyshev (MVUE) UCL | 35.34 |
| 95% Chebyshev (MVUE) UCL | 44.76 | 97.5% Chebyshev (MVUE) UCL | 57.82 |
| 99% Chebyshev (MVUE) UCL | 83.49 | | |

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

| | | | |
|---|---|---|---|
| 95% CLT UCL | 32.94 | 95% Jackknife UCL | 37.82 |
| 95% Standard Bootstrap UCL | 31.03 | 95% Bootstrap-t UCL | 338.9 |
| 95% Hall's Bootstrap UCL | 232.7 | 95% Percentile Bootstrap UCL | 35.32 |
| 95% BCA Bootstrap UCL | 37.15 | | |
| 90% Chebyshev(Mean, Sd) UCL | 46.52 | 95% Chebyshev(Mean, Sd) UCL | 60.13 |
| 97.5% Chebyshev(Mean, Sd) UCL | 79.02 | 99% Chebyshev(Mean, Sd) UCL | 116.1 |

Suggested UCL to Use

| | |
|---|---|
| 95% Adjusted Gamma UCL | 143.1 |

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

# APPENDIX G
# HISTORICAL GROUNDWATER FIGURES

## DAY-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-11 | 540 | 47* | 52* | ND |
| 2003-03-21 | 490 | 49 | 47 | ND |

## DAY-05R

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-11-12 | 800* | 110* | 540* | 14J* |
| 2006-09-14 | 600 | 55 | 110 | ND |
| 2007-08-24 | 590 | 30 | 21 | ND |
| 2012-09-21 | 184 | 17.2 | 11.8 | ND |
| 2015-01-05 | 171D | 10.1 | 27.1 | ND |

## MW-8-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-28 | 22 | 19 | 29 | ND |
| 2004-11-08 | 34 | 45 | 77 | ND |
| 2006-09-15 | 11J | 7.6 | 2.6J | ND |
| 2007-08-23 | 14 | 17 | 9J | ND |
| 2016-09-22 | 6.3 | 7 | ND | ND |
| 2018-03-27 | ND | ND | 5.1 | ND |
| 2018-12-12 | 6.8 | 7.6 | ND | ND |

## MW-79-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-11 | 84 | 92.6 | 22 | 1.3 |
| 2018-03-27 | 11.5 | 24.4 | 9 | ND |
| 2018-12-12 | ND | 3.8 | 8.7 | ND |
| 2019-03-12 | ND | 1.6 | 4.5 | ND |
| 2019-09-12 | 13.2 | 24.3 | 34.5 | ND |
| 2020-03-17 | ND | 2.2 | ND | ND |

## MW-21-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-25 | 18 | 16 | 220 | ND |
| 2004-11-15 | 37 | 29 | 200 | ND |
| 2006-09-15 | 6.8J | 7.5 | 33J | ND |
| 2015-01-05 | 10.7 | 11.7 | 13.9 | ND |

## MW-16R-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-24 | 36 | 20 | 21 | ND |
| 2004-11-04 | 39 | 31 | 7.3 | ND |

## MW-48-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-18 | 68J | 940J | 63 | ND |
| 2006-11-01 | 58 | 690 | 56 | ND |
| 2012-09-18 | 40.4 | 512D | 26.1 | ND |
| 2014-12-17 | 54.4 | 328D | 24.4 | ND |
| 2016-03-23 | 37.8 | 63.5 | ND | ND |
| 2016-06-22 | 29 | 43.5 | ND | ND |
| 2016-09-22 | 23.8 | 56.3 | ND | ND |
| 2018-03-28 | 15 | 5.7 | ND | ND |
| 2018-12-12 | 15.9* | 4.8 | ND | ND |
| 2020-03-17 | 9.1 | 1.6 | ND | ND |

## DAY-11S

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-06-25 | 420 | 54 | 420 | 48 |
| 2003-03-20 | 410 | 53 | 360 | 24 |
| 2004-11-09 | 230 | 19 | 270 | 180 |
| 2006-09-13 | 99 | 8 | 21 | 1.9J |
| 2007-08-20 | 110 | 9.8 | 15J | ND |
| 2015-01-05 | 55.6 | 11.8 | 15.1 | ND |

## MW-6A-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-02-05 | ND | ND | 1.2 | 260 |
| 2003-04-25 | ND | ND | 340 | 820 |
| 2003-08-13 | ND | ND | 180 | 280 |
| 2004-03-18 | ND | ND | 180 | 380 |
| 2004-06-28 | ND | ND | 72 | 150 |
| 2004-10-18 | ND | ND | 4.7 | 26 |
| 2004-11-18 | ND | ND | 340 | 500 |
| 2005-04-27 | ND | ND | 300 | 360 |
| 2016-03-23 | ND | ND | ND | 5.2 |
| 2016-06-20 | ND | ND | ND | 2 |
| 2016-09-21 | ND | ND | ND | 5.8 |
| 2018-03-27 | ND | ND | ND | ND |

## MW-34-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-12-08 | ND | ND | ND | ND |
| 2011-11-18 | ND | ND | ND | ND |
| 2015-01-06 | ND | ND | ND | ND |

## MW-7A-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-02-07 | ND | ND | 490* | 320* |
| 2003-04-28 | ND | ND | 550 | 450 |
| 2003-08-12 | ND | ND | ND | 0.7J |
| 2004-03-18 | ND | ND | 9.1 | 81 |
| 2004-06-29 | ND | ND | 5.3 | 27 |
| 2004-10-14 | ND | ND | 340 | 400 |
| 2004-11-18 | ND | ND | 3.3 | 14 |
| 2005-04-27 | ND | ND | 0.8J | 4.1J |
| 2018-01-09 | ND | ND | ND | ND |

## MW-83S-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-09 | ND | ND | ND | ND |
| 2018-03-26 | ND | ND | ND | ND |
| 2019-09-12 | 11.3 | 4.4 | 8.9 | ND |
| 2020-03-17 | ND | ND | 8.2 | ND |

## DAY-06

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-17 | 350 | 170 | 310 | ND |
| 2003-03-18 | ND | ND | 3.1 | 86J |
| 2004-03-19 | 1.4J | ND | 260 | 13 |
| 2004-06-28 | 3.4J | 5.1J | 260 | 7J |
| 2004-11-19 | 3.2 | 5.5 | 61 | 5.7 |
| 2011-11-16 | ND | ND | 30.6 | 20.3 |
| 2018-03-28 | ND | ND | 23.5 | 13.4 |

## MW-78-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-09 | ND | ND | ND | 1.2* |
| 2018-03-27 | ND | ND | ND | ND |
| 2018-12-11 | 3.6 | 2.5 | 11.4 | ND |
| 2019-03-12 | 2.7 | 5.9 | 9.4 | 5.5 |
| 2019-09-12 | 3.8* | 13.5* | 13.9* | 1.7* |
| 2020-03-17 | 1.8 | ND | ND | ND |

## MW-76S-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-09 | ND | ND | ND | ND |
| 2018-03-26 | ND | ND | ND | ND |
| 2018-12-11 | ND | ND | ND | ND |
| 2019-03-12 | ND | ND | 1.4 | ND |
| 2019-09-12 | ND | ND | ND | ND |
| 2020-03-17 | ND | ND | ND | ND |

## MW-77S-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-10 | ND | ND | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |
| 2019-09-13 | 1.7 | 1.2 | 1.1 | ND |
| 2020-03-17 | 2.9* | 1.6* | ND | ND |

## HD-10

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2008-12-05 | ND | ND | ND | ND |
| 2008-12-19 | ND | 5 | ND | ND |

## B-SA26

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-02 | 0.4J | 0.2J | 0.6 | ND |
| 2003-04-14 | 1.7 | 0.9J | 0.9 | ND |
| 2004-11-22 | 4.5 | 2.9 | 7.6 | ND |
| 2012-09-17 | 5.9 | 8.3 | ND | ND |
| 2014-12-17 | ND | 7* | ND | ND |
| 2016-09-22 | ND | ND | ND | ND |
| 2017-12-05 | ND | ND | ND | ND |
| 2018-05-22 | ND | ND | ND | ND |

## MW-84S-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-10 | 6.3 | ND | ND | ND |
| 2018-03-27 | 5.4 | ND | ND | ND |
| 2018-12-11 | 5.3 | 1.5 | ND | ND |
| 2019-09-12 | 4.6 | 1.2 | ND | ND |
| 2020-03-17 | 6.6 | 1.3 | ND | ND |

## MW-11-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-20 | 2.4 | 12 | 3.3 | ND |
| 2004-11-30 | 7.7 | 40 | 2.8 | ND |
| 2018-03-28 | ND | ND | ND | ND |

## LEGEND

East Phase Boundary

West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:

1. Bold results are mg/L and others are ug/L
2. Values posted are the maximum between the original and duplicate sample results. An * signifies a result from a duplicate sample.
3. Darker gray table headers signify UAI samples.

Abbreviations:

ND = not detected
NR = no result
MCL = maximum contaminant level
mg/L = milligrams per liter
ug/L = micrograms per liter
UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

0 125 250 375
Feet

SOURCE: City of Dayton Aerial Imagery

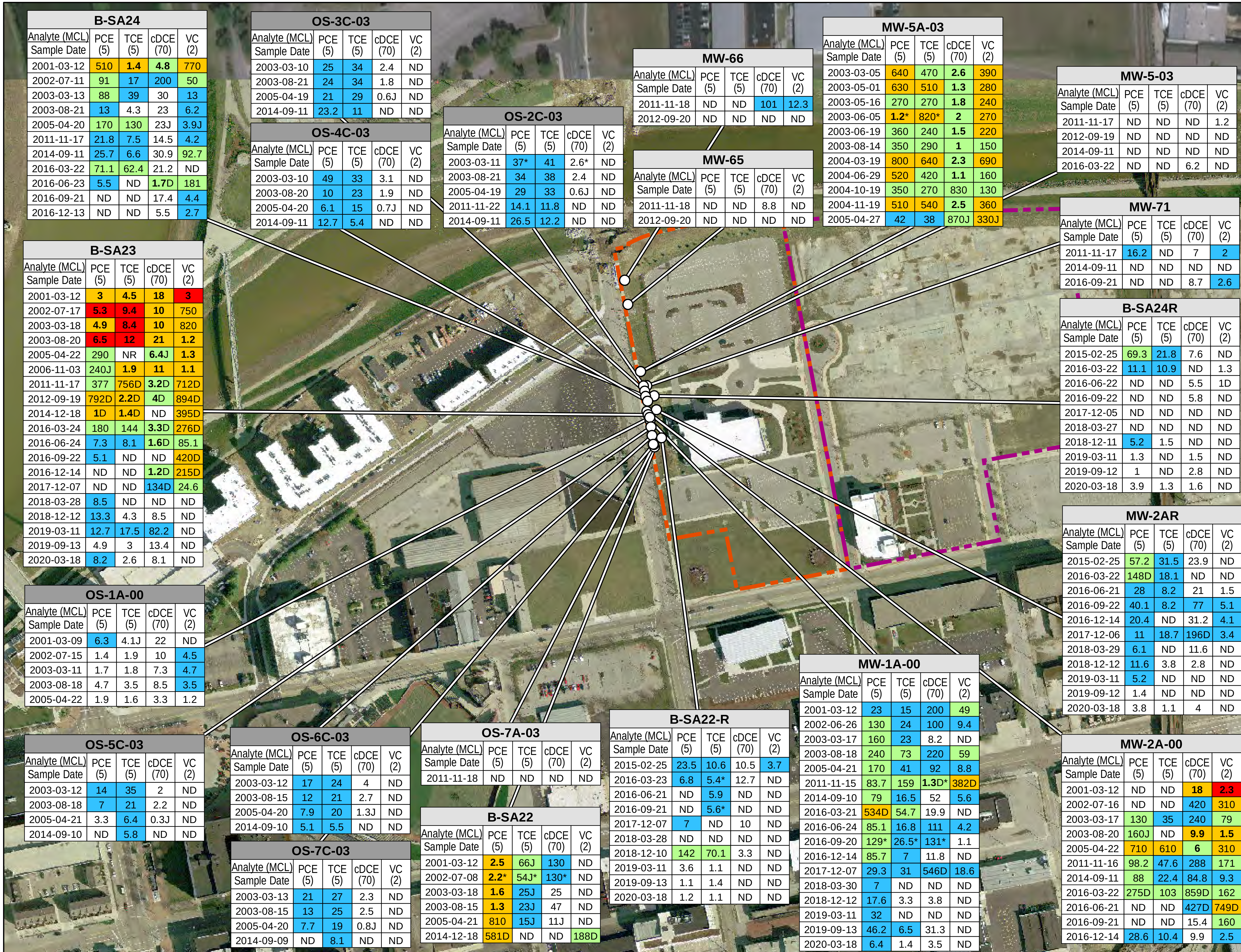
WESTON SOLUTIONS

FIGURE 1
UPPER AQUIFER (WATER TABLE)
WEST OF WEBSTER AVE
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020

PROJECT NO
12473.005.008.0450

FILE: C:\Projects\TechTown\GIS\Offsite Assessment\Strobridge\DS_CalloutTables_20200403.mxd 5:38:29 PM 4/3/2020 STROBRID



## B-SA24

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-12 | 510 | **1.4** | **4.8** | 770 |
| 2002-07-11 | 91 | 17 | 200 | 50 |
| 2003-03-13 | 88 | 39 | 30 | 13 |
| 2003-08-21 | 13 | 4.3 | 23 | 6.2 |
| 2005-04-20 | 170 | 130 | 23J | 3.9J |
| 2011-11-17 | 21.8 | 7.5 | 14.5 | 4.2 |
| 2014-09-11 | 25.7 | 6.6 | 30.9 | 92.7 |
| 2016-03-22 | 71.1 | 62.4 | 21.2 | ND |
| 2016-06-23 | 5.5 | ND | **1.7D** | 181 |
| 2016-09-21 | ND | ND | 17.4 | 4.4 |
| 2016-12-13 | ND | ND | 5.5 | 2.7 |

## OS-3C-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-10 | 25 | 34 | 2.4 | ND |
| 2003-08-21 | 24 | 34 | 1.8 | ND |
| 2005-04-19 | 21 | 29 | 0.6J | ND |
| 2014-09-11 | 23.2 | 11 | ND | ND |

## OS-4C-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-10 | 49 | 33 | 3.1 | ND |
| 2003-08-20 | 10 | 23 | 1.9 | ND |
| 2005-04-20 | 6.1 | 15 | 0.7J | ND |
| 2014-09-11 | 12.7 | 5.4 | ND | ND |

## OS-2C-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-11 | 37* | 41 | 2.6* | ND |
| 2003-08-21 | 34 | 38 | 2.4 | ND |
| 2005-04-19 | 29 | 33 | 0.6J | ND |
| 2011-11-22 | 14.1 | 11.8 | ND | ND |
| 2014-09-11 | 26.5 | 12.2 | ND | ND |

## MW-66

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-18 | ND | ND | 101 | 12.3 |
| 2012-09-20 | ND | ND | ND | ND |

## MW-65

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-18 | ND | ND | 8.8 | ND |
| 2012-09-20 | ND | ND | ND | ND |

## MW-5A-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-05 | 640 | 470 | **2.6** | 390 |
| 2003-05-01 | 630 | 510 | **1.3** | 280 |
| 2003-05-16 | 270 | 270 | **1.8** | 240 |
| 2003-06-05 | **1.2*** | 820* | **2** | 270 |
| 2003-06-19 | 360 | 240 | **1.5** | 220 |
| 2003-08-14 | 350 | 290 | **1** | 150 |
| 2004-03-19 | 800 | 640 | **2.3** | 690 |
| 2004-06-29 | 520 | 420 | **1.1** | 160 |
| 2004-10-19 | 350 | 270 | 830 | 130 |
| 2004-11-19 | 510 | 540 | **2.5** | 360 |
| 2005-04-27 | 42 | 38 | 870J | 330J |

## MW-5-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-17 | ND | ND | ND | 1.2 |
| 2012-09-19 | ND | ND | ND | ND |
| 2014-09-11 | ND | ND | ND | ND |
| 2016-03-22 | ND | ND | 6.2 | ND |

## MW-71

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-17 | 16.2 | ND | 7 | 2 |
| 2014-09-11 | ND | ND | ND | ND |
| 2016-09-21 | ND | ND | 8.7 | 2.6 |

## B-SA24R

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-25 | 69.3 | 21.8 | 7.6 | ND |
| 2016-03-22 | 11.1 | 10.9 | ND | 1.3 |
| 2016-06-22 | ND | ND | 5.5 | 1D |
| 2016-09-22 | ND | ND | 5.8 | ND |
| 2017-12-05 | ND | ND | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |
| 2018-12-11 | 5.2 | 1.5 | ND | ND |
| 2019-03-11 | 1.3 | ND | 1.5 | ND |
| 2019-09-12 | 1 | ND | 2.8 | ND |
| 2020-03-18 | 3.9 | 1.3 | 1.6 | ND |

## B-SA23

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-12 | **3** | **4.5** | **18** | **3** |
| 2002-07-17 | **5.3** | **9.4** | **10** | 750 |
| 2003-03-18 | **4.9** | **8.4** | **10** | 820 |
| 2003-08-20 | **6.5** | **12** | **21** | **1.2** |
| 2005-04-22 | 290 | NR | **6.4J** | **1.3** |
| 2006-11-03 | 240J | **1.9** | **11** | **1.1** |
| 2011-11-17 | 377 | 756D | **3.2D** | 712D |
| 2012-09-19 | 792D | **2.2D** | **4D** | 894D |
| 2014-12-18 | **1D** | **1.4D** | ND | 395D |
| 2016-03-24 | 180 | 144 | **3.3D** | 276D |
| 2016-06-24 | 7.3 | 8.1 | **1.6D** | 85.1 |
| 2016-09-22 | 5.1 | ND | ND | 420D |
| 2016-12-14 | ND | ND | **1.2D** | 215D |
| 2017-12-07 | ND | ND | 134D | 24.6 |
| 2018-03-28 | 8.5 | ND | ND | ND |
| 2018-12-12 | 13.3 | 4.3 | 8.5 | ND |
| 2019-03-11 | 12.7 | 17.5 | 82.2 | ND |
| 2019-09-13 | 4.9 | 3 | 13.4 | ND |
| 2020-03-18 | 8.2 | 2.6 | 8.1 | ND |

## OS-1A-00

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-09 | 6.3 | 4.1J | 22 | ND |
| 2002-07-15 | 1.4 | 1.9 | 10 | 4.5 |
| 2003-03-11 | 1.7 | 1.8 | 7.3 | 4.7 |
| 2003-08-18 | 4.7 | 3.5 | 8.5 | 3.5 |
| 2005-04-22 | 1.9 | 1.6 | 3.3 | 1.2 |

## OS-5C-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-12 | 14 | 35 | 2 | ND |
| 2003-08-18 | 7 | 21 | 2.2 | ND |
| 2005-04-21 | 3.3 | 6.4 | 0.3J | ND |
| 2014-09-10 | ND | 5.8 | ND | ND |

## OS-6C-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-12 | 17 | 24 | 4 | ND |
| 2003-08-15 | 12 | 21 | 2.7 | ND |
| 2005-04-20 | 7.9 | 20 | 1.3J | ND |
| 2014-09-10 | 5.1 | 5.5 | ND | ND |

## OS-7C-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-13 | 21 | 27 | 2.3 | ND |
| 2003-08-15 | 13 | 25 | 2.5 | ND |
| 2005-04-20 | 7.7 | 19 | 0.8J | ND |
| 2014-09-09 | ND | 8.1 | ND | ND |

## OS-7A-03

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-18 | ND | ND | ND | ND |

## B-SA22

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-12 | **2.5** | 66J | 130 | ND |
| 2002-07-08 | **2.2*** | 54J* | 130* | ND |
| 2003-03-18 | **1.6** | 25J | 25 | ND |
| 2003-08-15 | **1.3** | 23J | 47 | ND |
| 2005-04-21 | 810 | 15J | 11J | ND |
| 2014-12-18 | 581D | ND | ND | 188D |

## B-SA22-R

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-25 | 23.5 | 10.6 | 10.5 | 3.7 |
| 2016-03-23 | 6.8 | 5.4* | 12.7 | ND |
| 2016-06-21 | ND | 5.9 | ND | ND |
| 2016-09-21 | ND | 5.6* | ND | ND |
| 2017-12-07 | 7 | ND | 10 | ND |
| 2018-03-28 | ND | ND | ND | ND |
| 2018-12-10 | 142 | 70.1 | 3.3 | ND |
| 2019-03-11 | 3.6 | 1.1 | ND | ND |
| 2019-09-13 | 1.1 | 1.4 | ND | ND |
| 2020-03-18 | 1.2 | 1.1 | ND | ND |

## MW-1A-00

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-12 | 23 | 15 | 200 | 49 |
| 2002-06-26 | 130 | 24 | 100 | 9.4 |
| 2003-03-17 | 160 | 23 | 8.2 | ND |
| 2003-08-18 | 240 | 73 | 220 | 59 |
| 2005-04-21 | 170 | 41 | 92 | 8.8 |
| 2011-11-15 | 83.7 | 159 | **1.3D*** | 382D |
| 2014-09-10 | 79 | 16.5 | 52 | 5.6 |
| 2016-03-21 | 534D | 54.7 | 19.9 | ND |
| 2016-06-24 | 85.1 | 16.8 | 111 | 4.2 |
| 2016-09-20 | 129* | 26.5* | 131* | 1.1 |
| 2016-12-14 | 85.7 | 7 | 11.8 | ND |
| 2017-12-07 | 29.3 | 31 | 546D | 18.6 |
| 2018-03-30 | 7 | ND | ND | ND |
| 2018-12-12 | 17.6 | 3.3 | 3.8 | ND |
| 2019-03-11 | 32 | ND | ND | ND |
| 2019-09-13 | 46.2 | 6.5 | 31.3 | ND |
| 2020-03-18 | 6.4 | 1.4 | 3.5 | ND |

## MW-2AR

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-25 | 57.2 | 31.5 | 23.9 | ND |
| 2016-03-22 | 148D | 18.1 | ND | ND |
| 2016-06-21 | 28 | 8.2 | 21 | 1.5 |
| 2016-09-22 | 40.1 | 8.2 | 77 | 5.1 |
| 2016-12-14 | 20.4 | ND | 31.2 | 4.1 |
| 2017-12-06 | 11 | 18.7 | 196D | 3.4 |
| 2018-03-29 | 6.1 | ND | 11.6 | ND |
| 2018-12-12 | 11.6 | 3.8 | 2.8 | ND |
| 2019-03-11 | 5.2 | ND | ND | ND |
| 2019-09-12 | 1.4 | ND | ND | ND |
| 2020-03-18 | 3.8 | 1.1 | 4 | ND |

## MW-2A-00

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-12 | ND | ND | **18** | **2.3** |
| 2002-07-16 | ND | ND | 420 | 310 |
| 2003-03-17 | 130 | 35 | 240 | 79 |
| 2003-08-20 | 160J | ND | **9.9** | **1.5** |
| 2005-04-22 | 710 | 610 | **6** | 310 |
| 2011-11-16 | 98.2 | 47.6 | 288 | 171 |
| 2014-09-11 | 88 | 22.4 | 84.8 | 9.3 |
| 2016-03-22 | 275D | 103 | 859D | 162 |
| 2016-06-21 | ND | ND | 427D | 749D |
| 2016-09-21 | ND | ND | 15.4 | 160 |
| 2016-12-14 | 28.6 | 10.4 | 9.9 | 2.5 |

## LEGEND

East Phase Boundary

West Phase Boundary

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- <=1x
- 1.01-10x
- 10.01-100x
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TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N

0 125 250 375

Feet

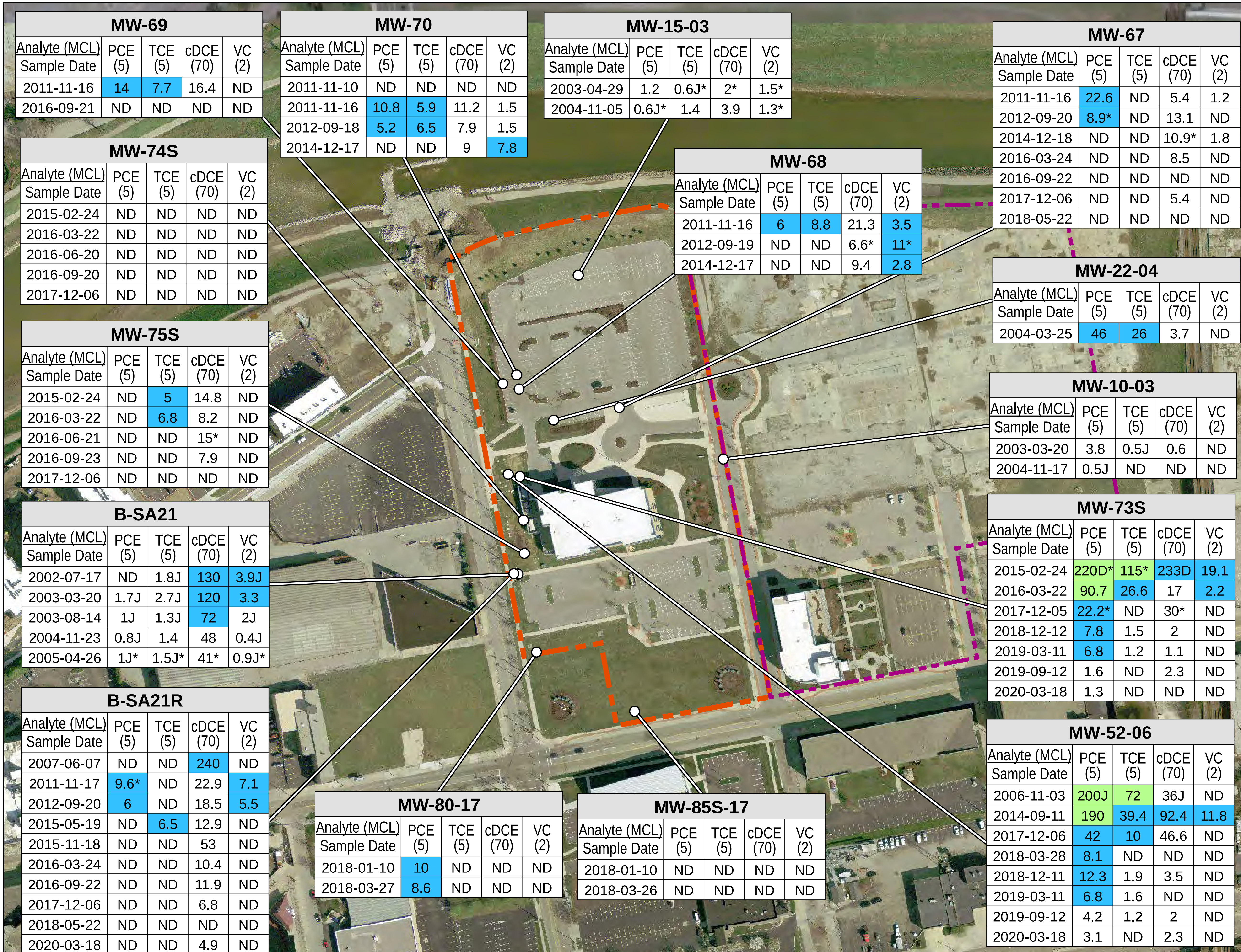
SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 2
UPPER AQUIFER (WATER TABLE)
WEBSTER CORRIDOR
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020 | PROJECT NO 12473.005.008.0450

FILE: C:\Projects\TechTown\GIS\Offsite Assessment\Strobridge\DS_CalloutTables_20200403.mxd 10:02:52 AM 4/4/2020 STROBRID



### MW-69

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-16 | 14 | 7.7 | 16.4 | ND |
| 2016-09-21 | ND | ND | ND | ND |

### MW-70

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-10 | ND | ND | ND | ND |
| 2011-11-16 | 10.8 | 5.9 | 11.2 | 1.5 |
| 2012-09-18 | 5.2 | 6.5 | 7.9 | 1.5 |
| 2014-12-17 | ND | ND | 9 | 7.8 |

### MW-15-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-29 | 1.2 | 0.6J* | 2* | 1.5* |
| 2004-11-05 | 0.6J* | 1.4 | 3.9 | 1.3* |

### MW-67

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-16 | 22.6 | ND | 5.4 | 1.2 |
| 2012-09-20 | 8.9* | ND | 13.1 | ND |
| 2014-12-18 | ND | ND | 10.9* | 1.8 |
| 2016-03-24 | ND | ND | 8.5 | ND |
| 2016-09-22 | ND | ND | ND | ND |
| 2017-12-06 | ND | ND | 5.4 | ND |
| 2018-05-22 | ND | ND | ND | ND |

### MW-74S

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-24 | ND | ND | ND | ND |
| 2016-03-22 | ND | ND | ND | ND |
| 2016-06-20 | ND | ND | ND | ND |
| 2016-09-20 | ND | ND | ND | ND |
| 2017-12-06 | ND | ND | ND | ND |

### MW-68

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2011-11-16 | 6 | 8.8 | 21.3 | 3.5 |
| 2012-09-19 | ND | ND | 6.6* | 11* |
| 2014-12-17 | ND | ND | 9.4 | 2.8 |

### MW-22-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-25 | 46 | 26 | 3.7 | ND |

### MW-75S

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-24 | ND | 5 | 14.8 | ND |
| 2016-03-22 | ND | 6.8 | 8.2 | ND |
| 2016-06-21 | ND | ND | 15* | ND |
| 2016-09-23 | ND | ND | 7.9 | ND |
| 2017-12-06 | ND | ND | ND | ND |

### MW-10-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-20 | 3.8 | 0.5J | 0.6 | ND |
| 2004-11-17 | 0.5J | ND | ND | ND |

### B-SA21

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-17 | ND | 1.8J | 130 | 3.9J |
| 2003-03-20 | 1.7J | 2.7J | 120 | 3.3 |
| 2003-08-14 | 1J | 1.3J | 72 | 2J |
| 2004-11-23 | 0.8J | 1.4 | 48 | 0.4J |
| 2005-04-26 | 1J* | 1.5J* | 41* | 0.9J* |

### MW-73S

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-24 | 220D* | 115* | 233D | 19.1 |
| 2016-03-22 | 90.7 | 26.6 | 17 | 2.2 |
| 2017-12-05 | 22.2* | ND | 30* | ND |
| 2018-12-12 | 7.8 | 1.5 | 2 | ND |
| 2019-03-11 | 6.8 | 1.2 | 1.1 | ND |
| 2019-09-12 | 1.6 | ND | 2.3 | ND |
| 2020-03-18 | 1.3 | ND | ND | ND |

### B-SA21R

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-07 | ND | ND | 240 | ND |
| 2011-11-17 | 9.6* | ND | 22.9 | 7.1 |
| 2012-09-20 | 6 | ND | 18.5 | 5.5 |
| 2015-05-19 | ND | 6.5 | 12.9 | ND |
| 2015-11-18 | ND | ND | 53 | ND |
| 2016-03-24 | ND | ND | 10.4 | ND |
| 2016-09-22 | ND | ND | 11.9 | ND |
| 2017-12-06 | ND | ND | 6.8 | ND |
| 2018-05-22 | ND | ND | ND | ND |
| 2020-03-18 | ND | ND | 4.9 | ND |

### MW-80-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-10 | 10 | ND | ND | ND |
| 2018-03-27 | 8.6 | ND | ND | ND |

### MW-85S-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-10 | ND | ND | ND | ND |
| 2018-03-26 | ND | ND | ND | ND |

### MW-52-06

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-11-03 | 200J | 72 | 36J | ND |
| 2014-09-11 | 190 | 39.4 | 92.4 | 11.8 |
| 2017-12-06 | 42 | 10 | 46.6 | ND |
| 2018-03-28 | 8.1 | ND | ND | ND |
| 2018-12-11 | 12.3 | 1.9 | 3.5 | ND |
| 2019-03-11 | 6.8 | 1.6 | ND | ND |
| 2019-09-12 | 4.2 | 1.2 | 2 | ND |
| 2020-03-18 | 3.1 | ND | 2.3 | ND |

## LEGEND

East Phase Boundary

West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:

1. Bold results are mg/L and others are ug/L
2. Values posted are the maximum between the original and duplicate sample results. An * signifies a result from a duplicate sample.
3. Darker gray table headers signify UAI samples.

Abbreviations:

ND = not detected
NR = no result
MCL = maximum contaminant level
mg/L = milligrams per liter
ug/L = micrograms per liter
UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N

0 125 250
Feet

SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 3
UPPER AQUIFER (WATER TABLE)
WEST PHASE
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020 | PROJECT NO 12473.005.008.0450

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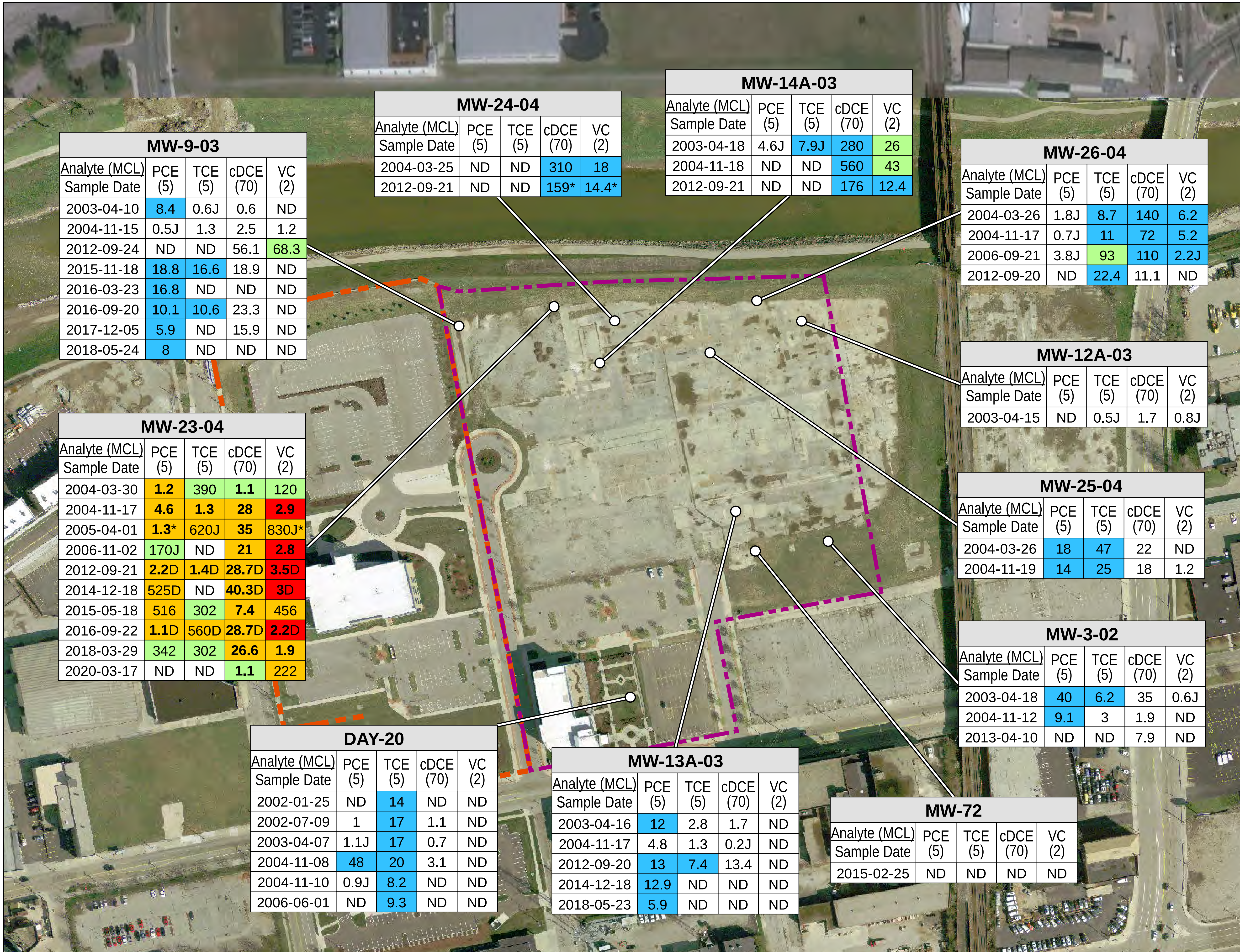

### MW-9-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-10 | 8.4 | 0.6J | 0.6 | ND |
| 2004-11-15 | 0.5J | 1.3 | 2.5 | 1.2 |
| 2012-09-24 | ND | ND | 56.1 | 68.3 |
| 2015-11-18 | 18.8 | 16.6 | 18.9 | ND |
| 2016-03-23 | 16.8 | ND | ND | ND |
| 2016-09-20 | 10.1 | 10.6 | 23.3 | ND |
| 2017-12-05 | 5.9 | ND | 15.9 | ND |
| 2018-05-24 | 8 | ND | ND | ND |

### MW-24-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-25 | ND | ND | 310 | 18 |
| 2012-09-21 | ND | ND | 159* | 14.4* |

### MW-14A-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-18 | 4.6J | 7.9J | 280 | 26 |
| 2004-11-18 | ND | ND | 560 | 43 |
| 2012-09-21 | ND | ND | 176 | 12.4 |

### MW-26-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-26 | 1.8J | 8.7 | 140 | 6.2 |
| 2004-11-17 | 0.7J | 11 | 72 | 5.2 |
| 2006-09-21 | 3.8J | 93 | 110 | 2.2J |
| 2012-09-20 | ND | 22.4 | 11.1 | ND |

### MW-12A-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-15 | ND | 0.5J | 1.7 | 0.8J |

### MW-23-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-30 | **1.2** | 390 | **1.1** | 120 |
| 2004-11-17 | **4.6** | **1.3** | **28** | **2.9** |
| 2005-04-01 | **1.3*** | 620J | **35** | 830J* |
| 2006-11-02 | 170J | ND | **21** | **2.8** |
| 2012-09-21 | **2.2D** | **1.4D** | **28.7D** | **3.5D** |
| 2014-12-18 | 525D | ND | **40.3D** | **3D** |
| 2015-05-18 | 516 | 302 | **7.4** | 456 |
| 2016-09-22 | **1.1D** | 560D | **28.7D** | **2.2D** |
| 2018-03-29 | 342 | 302 | **26.6** | **1.9** |
| 2020-03-17 | ND | ND | **1.1** | 222 |

### MW-25-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-26 | 18 | 47 | 22 | ND |
| 2004-11-19 | 14 | 25 | 18 | 1.2 |

### MW-3-02

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-18 | 40 | 6.2 | 35 | 0.6J |
| 2004-11-12 | 9.1 | 3 | 1.9 | ND |
| 2013-04-10 | ND | ND | 7.9 | ND |

### DAY-20

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-01-25 | ND | 14 | ND | ND |
| 2002-07-09 | 1 | 17 | 1.1 | ND |
| 2003-04-07 | 1.1J | 17 | 0.7 | ND |
| 2004-11-08 | 48 | 20 | 3.1 | ND |
| 2004-11-10 | 0.9J | 8.2 | ND | ND |
| 2006-06-01 | ND | 9.3 | ND | ND |

### MW-13A-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-16 | 12 | 2.8 | 1.7 | ND |
| 2004-11-17 | 4.8 | 1.3 | 0.2J | ND |
| 2012-09-20 | 13 | 7.4 | 13.4 | ND |
| 2014-12-18 | 12.9 | ND | ND | ND |
| 2018-05-23 | 5.9 | ND | ND | ND |

### MW-72

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-25 | ND | ND | ND | ND |

## LEGEND

East Phase Boundary

West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:

1. Bold results are mg/L and others are ug/L
2. Values posted are the maximum between the original and duplicate sample results. An * signifies a result from a duplicate sample.
3. Darker gray table headers signify UAI samples.

Abbreviations:

ND = not detected
NR = no result
MCL = maximum contaminant level
mg/L = milligrams per liter
ug/L = micrograms per liter
UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N

0 125 250

Feet

SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 4
UPPER AQUIFER (WATER TABLE)
EAST PHASE
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020 | PROJECT NO 12473.005.008.0450

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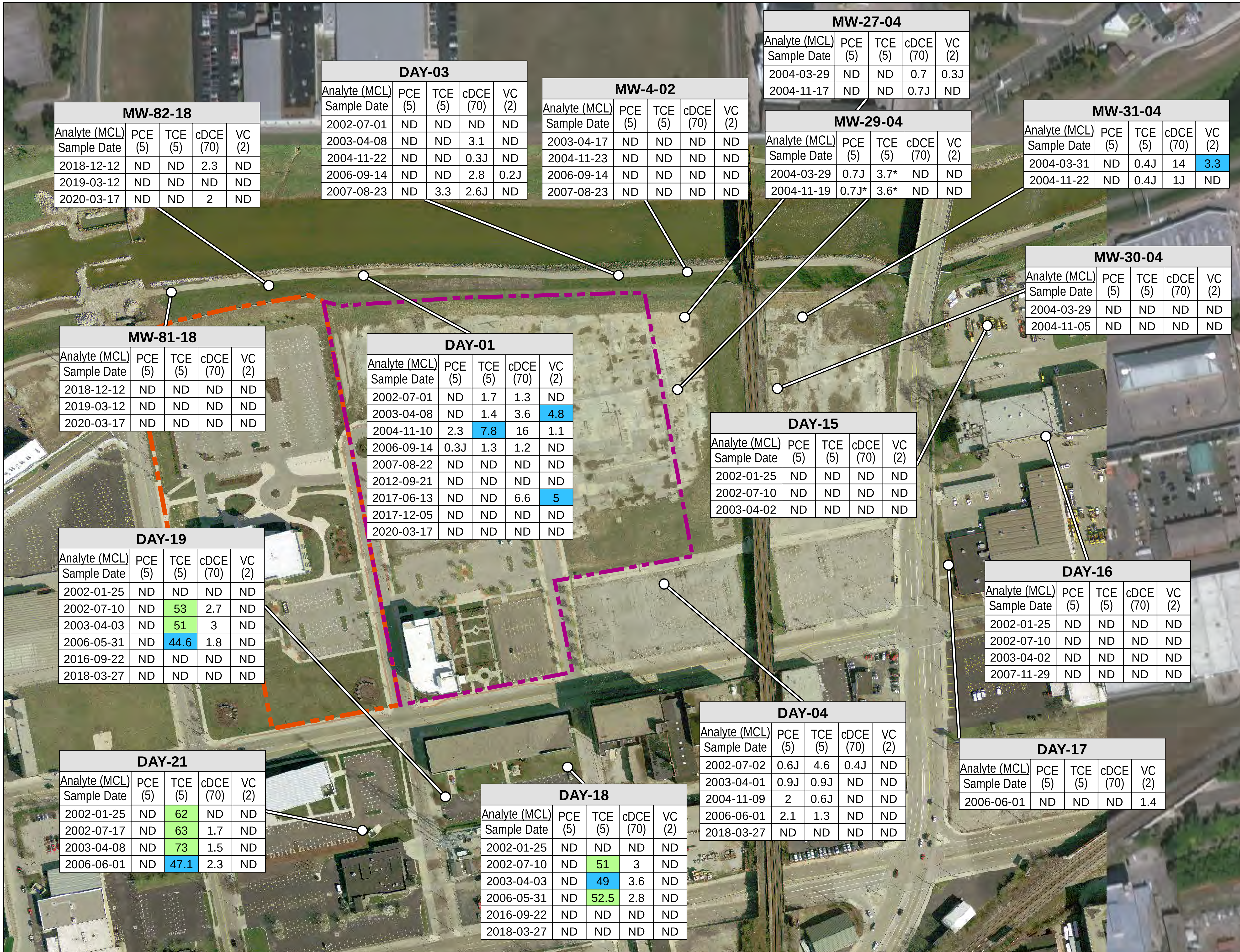

### MW-27-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-29 | ND | ND | 0.7 | 0.3J |
| 2004-11-17 | ND | ND | 0.7J | ND |

### DAY-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-01 | ND | ND | ND | ND |
| 2003-04-08 | ND | ND | 3.1 | ND |
| 2004-11-22 | ND | ND | 0.3J | ND |
| 2006-09-14 | ND | ND | 2.8 | 0.2J |
| 2007-08-23 | ND | 3.3 | 2.6J | ND |

### MW-4-02

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-17 | ND | ND | ND | ND |
| 2004-11-23 | ND | ND | ND | ND |
| 2006-09-14 | ND | ND | ND | ND |
| 2007-08-23 | ND | ND | ND | ND |

### MW-82-18

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-12-12 | ND | ND | 2.3 | ND |
| 2019-03-12 | ND | ND | ND | ND |
| 2020-03-17 | ND | ND | 2 | ND |

### MW-29-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-29 | 0.7J | 3.7* | ND | ND |
| 2004-11-19 | 0.7J* | 3.6* | ND | ND |

### MW-31-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-31 | ND | 0.4J | 14 | 3.3 |
| 2004-11-22 | ND | 0.4J | 1J | ND |

### MW-30-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-29 | ND | ND | ND | ND |
| 2004-11-05 | ND | ND | ND | ND |

### MW-81-18

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-12-12 | ND | ND | ND | ND |
| 2019-03-12 | ND | ND | ND | ND |
| 2020-03-17 | ND | ND | ND | ND |

### DAY-01

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-01 | ND | 1.7 | 1.3 | ND |
| 2003-04-08 | ND | 1.4 | 3.6 | 4.8 |
| 2004-11-10 | 2.3 | 7.8 | 16 | 1.1 |
| 2006-09-14 | 0.3J | 1.3 | 1.2 | ND |
| 2007-08-22 | ND | ND | ND | ND |
| 2012-09-21 | ND | ND | ND | ND |
| 2017-06-13 | ND | ND | 6.6 | 5 |
| 2017-12-05 | ND | ND | ND | ND |
| 2020-03-17 | ND | ND | ND | ND |

### DAY-15

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-01-25 | ND | ND | ND | ND |
| 2002-07-10 | ND | ND | ND | ND |
| 2003-04-02 | ND | ND | ND | ND |

### DAY-19

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-01-25 | ND | ND | ND | ND |
| 2002-07-10 | ND | 53 | 2.7 | ND |
| 2003-04-03 | ND | 51 | 3 | ND |
| 2006-05-31 | ND | 44.6 | 1.8 | ND |
| 2016-09-22 | ND | ND | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

### DAY-16

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-01-25 | ND | ND | ND | ND |
| 2002-07-10 | ND | ND | ND | ND |
| 2003-04-02 | ND | ND | ND | ND |
| 2007-11-29 | ND | ND | ND | ND |

### DAY-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-02 | 0.6J | 4.6 | 0.4J | ND |
| 2003-04-01 | 0.9J | 0.9J | ND | ND |
| 2004-11-09 | 2 | 0.6J | ND | ND |
| 2006-06-01 | 2.1 | 1.3 | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

### DAY-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-06-01 | ND | ND | ND | 1.4 |

### DAY-21

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-01-25 | ND | 62 | ND | ND |
| 2002-07-17 | ND | 63 | 1.7 | ND |
| 2003-04-08 | ND | 73 | 1.5 | ND |
| 2006-06-01 | ND | 47.1 | 2.3 | ND |

### DAY-18

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-01-25 | ND | ND | ND | ND |
| 2002-07-10 | ND | 51 | 3 | ND |
| 2003-04-03 | ND | 49 | 3.6 | ND |
| 2006-05-31 | ND | 52.5 | 2.8 | ND |
| 2016-09-22 | ND | ND | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

## LEGEND

East Phase Boundary
West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:
1. Bold results are mg/L and others are ug/L
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Abbreviations:
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UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N

0 125 250 375
Feet

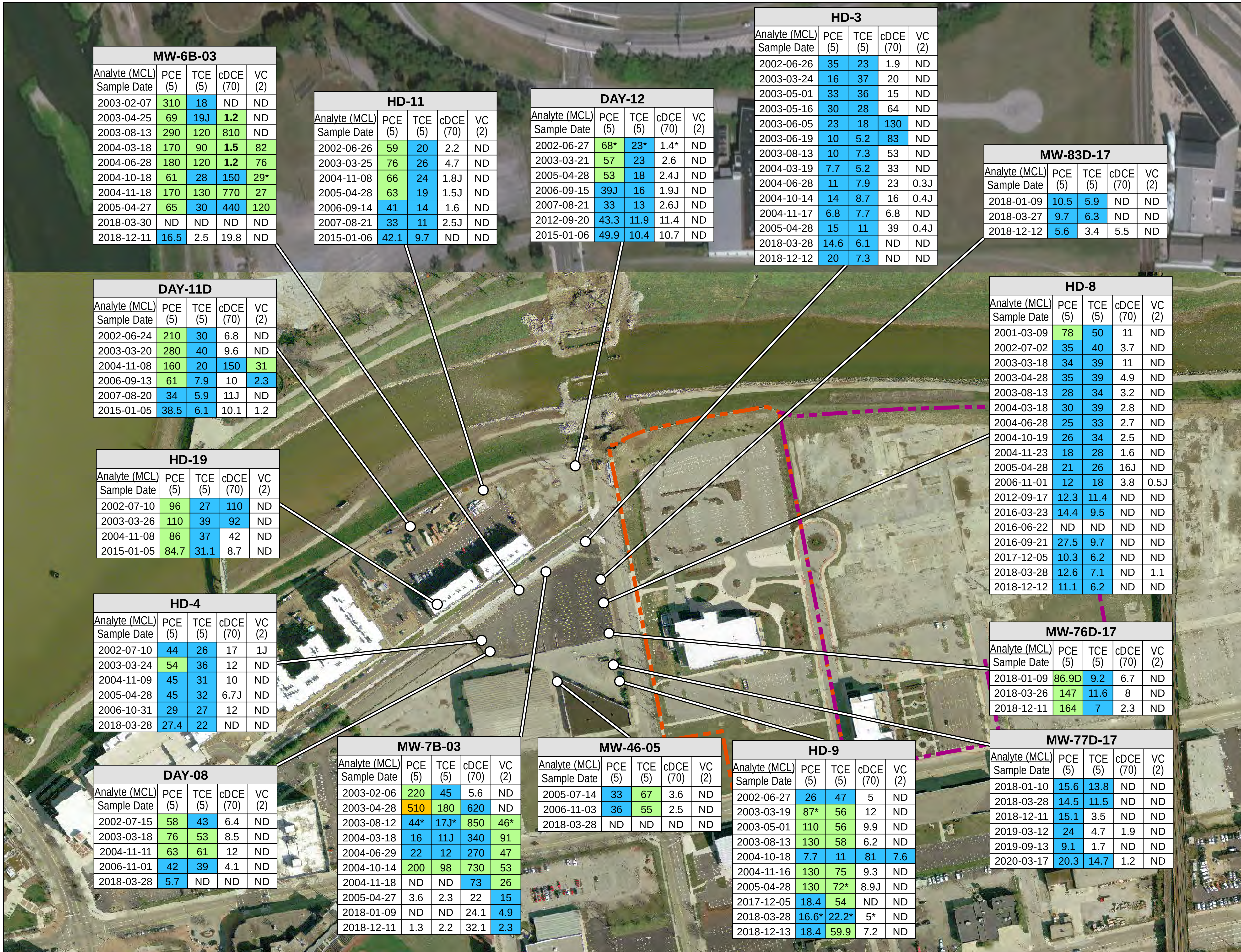
SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 5
UPPER AQUIFER (WATER TABLE)
OFFSITE (EAST OF WEBSTER AVE)
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020 | PROJECT NO 12473.005.008.0450

FILE: C:\Projects\TechTown\GIS\Offsite Assessment\Strobridge\DS_CalloutTables_20200403.mxd 5:38:51 PM 4/3/2020 STROBRID



## MW-6B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-02-07 | 310 | 18 | ND | ND |
| 2003-04-25 | 69 | 19J | **1.2** | ND |
| 2003-08-13 | 290 | 120 | 810 | ND |
| 2004-03-18 | 170 | 90 | **1.5** | 82 |
| 2004-06-28 | 180 | 120 | **1.2** | 76 |
| 2004-10-18 | 61 | 28 | 150 | 29* |
| 2004-11-18 | 170 | 130 | 770 | 27 |
| 2005-04-27 | 65 | 30 | 440 | 120 |
| 2018-03-30 | ND | ND | ND | ND |
| 2018-12-11 | 16.5 | 2.5 | 19.8 | ND |

## HD-11

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-06-26 | 59 | 20 | 2.2 | ND |
| 2003-03-25 | 76 | 26 | 4.7 | ND |
| 2004-11-08 | 66 | 24 | 1.8J | ND |
| 2005-04-28 | 63 | 19 | 1.5J | ND |
| 2006-09-14 | 41 | 14 | 1.6 | ND |
| 2007-08-21 | 33 | 11 | 2.5J | ND |
| 2015-01-06 | 42.1 | 9.7 | ND | ND |

## DAY-12

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-06-27 | 68* | 23* | 1.4* | ND |
| 2003-03-21 | 57 | 23 | 2.6 | ND |
| 2005-04-28 | 53 | 18 | 2.4J | ND |
| 2006-09-15 | 39J | 16 | 1.9J | ND |
| 2007-08-21 | 33 | 13 | 2.6J | ND |
| 2012-09-20 | 43.3 | 11.9 | 11.4 | ND |
| 2015-01-06 | 49.9 | 10.4 | 10.7 | ND |

## HD-3

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-06-26 | 35 | 23 | 1.9 | ND |
| 2003-03-24 | 16 | 37 | 20 | ND |
| 2003-05-01 | 33 | 36 | 15 | ND |
| 2003-05-16 | 30 | 28 | 64 | ND |
| 2003-06-05 | 23 | 18 | 130 | ND |
| 2003-06-19 | 10 | 5.2 | 83 | ND |
| 2003-08-13 | 10 | 7.3 | 53 | ND |
| 2004-03-19 | 7.7 | 5.2 | 33 | ND |
| 2004-06-28 | 11 | 7.9 | 23 | 0.3J |
| 2004-10-14 | 14 | 8.7 | 16 | 0.4J |
| 2004-11-17 | 6.8 | 7.7 | 6.8 | ND |
| 2005-04-28 | 15 | 11 | 39 | 0.4J |
| 2018-03-28 | 14.6 | 6.1 | ND | ND |
| 2018-12-12 | 20 | 7.3 | ND | ND |

## MW-83D-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-09 | 10.5 | 5.9 | ND | ND |
| 2018-03-27 | 9.7 | 6.3 | ND | ND |
| 2018-12-12 | 5.6 | 3.4 | 5.5 | ND |

## DAY-11D

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-06-24 | 210 | 30 | 6.8 | ND |
| 2003-03-20 | 280 | 40 | 9.6 | ND |
| 2004-11-08 | 160 | 20 | 150 | 31 |
| 2006-09-13 | 61 | 7.9 | 10 | 2.3 |
| 2007-08-20 | 34 | 5.9 | 11J | ND |
| 2015-01-05 | 38.5 | 6.1 | 10.1 | 1.2 |

## HD-19

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-10 | 96 | 27 | 110 | ND |
| 2003-03-26 | 110 | 39 | 92 | ND |
| 2004-11-08 | 86 | 37 | 42 | ND |
| 2015-01-05 | 84.7 | 31.1 | 8.7 | ND |

## HD-4

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-10 | 44 | 26 | 17 | 1J |
| 2003-03-24 | 54 | 36 | 12 | ND |
| 2004-11-09 | 45 | 31 | 10 | ND |
| 2005-04-28 | 45 | 32 | 6.7J | ND |
| 2006-10-31 | 29 | 27 | 12 | ND |
| 2018-03-28 | 27.4 | 22 | ND | ND |

## DAY-08

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-15 | 58 | 43 | 6.4 | ND |
| 2003-03-18 | 76 | 53 | 8.5 | ND |
| 2004-11-11 | 63 | 61 | 12 | ND |
| 2006-11-01 | 42 | 39 | 4.1 | ND |
| 2018-03-28 | 5.7 | ND | ND | ND |

## MW-7B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-02-06 | 220 | 45 | 5.6 | ND |
| 2003-04-28 | 510 | 180 | 620 | ND |
| 2003-08-12 | 44* | 17J* | 850 | 46* |
| 2004-03-18 | 16 | 11J | 340 | 91 |
| 2004-06-29 | 22 | 12 | 270 | 47 |
| 2004-10-14 | 200 | 98 | 730 | 53 |
| 2004-11-18 | ND | ND | 73 | 26 |
| 2005-04-27 | 3.6 | 2.3 | 22 | 15 |
| 2018-01-09 | ND | ND | 24.1 | 4.9 |
| 2018-12-11 | 1.3 | 2.2 | 32.1 | 2.3 |

## MW-46-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-14 | 33 | 67 | 3.6 | ND |
| 2006-11-03 | 36 | 55 | 2.5 | ND |
| 2018-03-28 | ND | ND | ND | ND |

## HD-9

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-06-27 | 26 | 47 | 5 | ND |
| 2003-03-19 | 87* | 56 | 12 | ND |
| 2003-05-01 | 110 | 56 | 9.9 | ND |
| 2003-08-13 | 130 | 58 | 6.2 | ND |
| 2004-10-18 | 7.7 | 11 | 81 | 7.6 |
| 2004-11-16 | 130 | 75 | 9.3 | ND |
| 2005-04-28 | 130 | 72* | 8.9J | ND |
| 2017-12-05 | 18.4 | 54 | ND | ND |
| 2018-03-28 | 16.6* | 22.2* | 5* | ND |
| 2018-12-13 | 18.4 | 59.9 | 7.2 | ND |

## HD-8

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-09 | 78 | 50 | 11 | ND |
| 2002-07-02 | 35 | 40 | 3.7 | ND |
| 2003-03-18 | 34 | 39 | 11 | ND |
| 2003-04-28 | 35 | 39 | 4.9 | ND |
| 2003-08-13 | 28 | 34 | 3.2 | ND |
| 2004-03-18 | 30 | 39 | 2.8 | ND |
| 2004-06-28 | 25 | 33 | 2.7 | ND |
| 2004-10-19 | 26 | 34 | 2.5 | ND |
| 2004-11-23 | 18 | 28 | 1.6 | ND |
| 2005-04-28 | 21 | 26 | 16J | ND |
| 2006-11-01 | 12 | 18 | 3.8 | 0.5J |
| 2012-09-17 | 12.3 | 11.4 | ND | ND |
| 2016-03-23 | 14.4 | 9.5 | ND | ND |
| 2016-06-22 | ND | ND | ND | ND |
| 2016-09-21 | 27.5 | 9.7 | ND | ND |
| 2017-12-05 | 10.3 | 6.2 | ND | ND |
| 2018-03-28 | 12.6 | 7.1 | ND | 1.1 |
| 2018-12-12 | 11.1 | 6.2 | ND | ND |

## MW-76D-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-09 | 86.9D | 9.2 | 6.7 | ND |
| 2018-03-26 | 147 | 11.6 | 8 | ND |
| 2018-12-11 | 164 | 7 | 2.3 | ND |

## MW-77D-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-10 | 15.6 | 13.8 | ND | ND |
| 2018-03-28 | 14.5 | 11.5 | ND | ND |
| 2018-12-11 | 15.1 | 3.5 | ND | ND |
| 2019-03-12 | 24 | 4.7 | 1.9 | ND |
| 2019-09-13 | 9.1 | 1.7 | ND | ND |
| 2020-03-17 | 20.3 | 14.7 | 1.2 | ND |

## LEGEND

- East Phase Boundary
- West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:

1. Bold results are mg/L and others are ug/L
2. Values posted are the maximum between the original and duplicate sample results. An * signifies a result from a duplicate sample.
3. Darker gray table headers signify UAI samples.

Abbreviations:

ND = not detected
NR = no result
MCL = maximum contaminant level
mg/L = milligrams per liter
ug/L = micrograms per liter
UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N

0 125 250 375

Feet

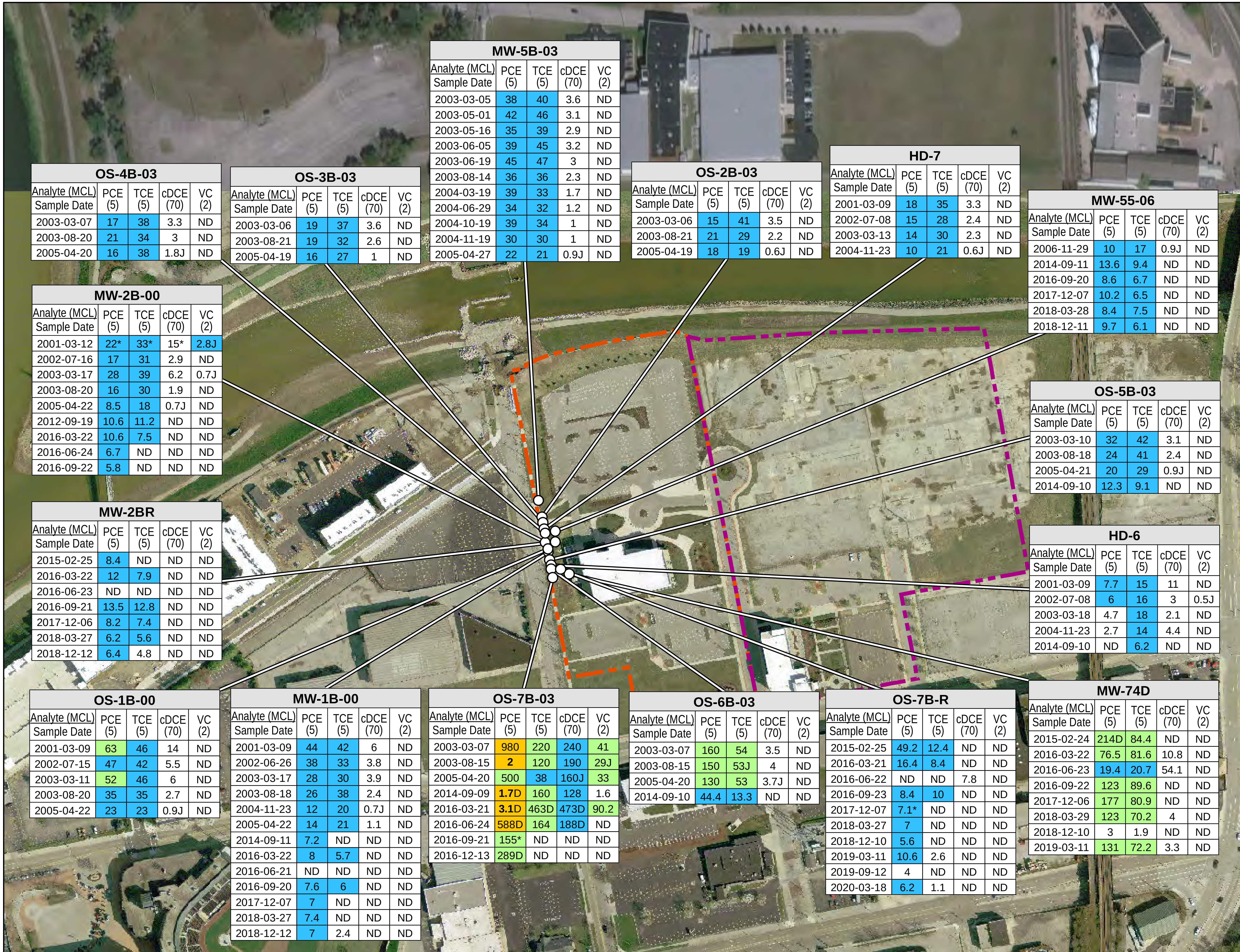
SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 6
UPPER AQUIFER (TOP OF TILL)
WEST OF WEBSTER AVE
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 |
|---|---|

FILE: C:\Projects\TechTown\GIS\Offsite Assessment\Strobridge\DS_CallOutTables_20200403.mxd 5:38:56 PM 4/3/2020 STROBRID



### MW-5B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-05 | 38 | 40 | 3.6 | ND |
| 2003-05-01 | 42 | 46 | 3.1 | ND |
| 2003-05-16 | 35 | 39 | 2.9 | ND |
| 2003-06-05 | 39 | 45 | 3.2 | ND |
| 2003-06-19 | 45 | 47 | 3 | ND |
| 2003-08-14 | 36 | 36 | 2.3 | ND |
| 2004-03-19 | 39 | 33 | 1.7 | ND |
| 2004-06-29 | 34 | 32 | 1.2 | ND |
| 2004-10-19 | 39 | 34 | 1 | ND |
| 2004-11-19 | 30 | 30 | 1 | ND |
| 2005-04-27 | 22 | 21 | 0.9J | ND |

### OS-4B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-07 | 17 | 38 | 3.3 | ND |
| 2003-08-20 | 21 | 34 | 3 | ND |
| 2005-04-20 | 16 | 38 | 1.8J | ND |

### OS-3B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-06 | 19 | 37 | 3.6 | ND |
| 2003-08-21 | 19 | 32 | 2.6 | ND |
| 2005-04-19 | 16 | 27 | 1 | ND |

### OS-2B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-06 | 15 | 41 | 3.5 | ND |
| 2003-08-21 | 21 | 29 | 2.2 | ND |
| 2005-04-19 | 18 | 19 | 0.6J | ND |

### HD-7

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-09 | 18 | 35 | 3.3 | ND |
| 2002-07-08 | 15 | 28 | 2.4 | ND |
| 2003-03-13 | 14 | 30 | 2.3 | ND |
| 2004-11-23 | 10 | 21 | 0.6J | ND |

### MW-55-06

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-11-29 | 10 | 17 | 0.9J | ND |
| 2014-09-11 | 13.6 | 9.4 | ND | ND |
| 2016-09-20 | 8.6 | 6.7 | ND | ND |
| 2017-12-07 | 10.2 | 6.5 | ND | ND |
| 2018-03-28 | 8.4 | 7.5 | ND | ND |
| 2018-12-11 | 9.7 | 6.1 | ND | ND |

### MW-2B-00

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-12 | 22* | 33* | 15* | 2.8J |
| 2002-07-16 | 17 | 31 | 2.9 | ND |
| 2003-03-17 | 28 | 39 | 6.2 | 0.7J |
| 2003-08-20 | 16 | 30 | 1.9 | ND |
| 2005-04-22 | 8.5 | 18 | 0.7J | ND |
| 2012-09-19 | 10.6 | 11.2 | ND | ND |
| 2016-03-22 | 10.6 | 7.5 | ND | ND |
| 2016-06-24 | 6.7 | ND | ND | ND |
| 2016-09-22 | 5.8 | ND | ND | ND |

### OS-5B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-10 | 32 | 42 | 3.1 | ND |
| 2003-08-18 | 24 | 41 | 2.4 | ND |
| 2005-04-21 | 20 | 29 | 0.9J | ND |
| 2014-09-10 | 12.3 | 9.1 | ND | ND |

### MW-2BR

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-25 | 8.4 | ND | ND | ND |
| 2016-03-22 | 12 | 7.9 | ND | ND |
| 2016-06-23 | ND | ND | ND | ND |
| 2016-09-21 | 13.5 | 12.8 | ND | ND |
| 2017-12-06 | 8.2 | 7.4 | ND | ND |
| 2018-03-27 | 6.2 | 5.6 | ND | ND |
| 2018-12-12 | 6.4 | 4.8 | ND | ND |

### HD-6

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-09 | 7.7 | 15 | 11 | ND |
| 2002-07-08 | 6 | 16 | 3 | 0.5J |
| 2003-03-18 | 4.7 | 18 | 2.1 | ND |
| 2004-11-23 | 2.7 | 14 | 4.4 | ND |
| 2014-09-10 | ND | 6.2 | ND | ND |

### OS-1B-00

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-09 | 63 | 46 | 14 | ND |
| 2002-07-15 | 47 | 42 | 5.5 | ND |
| 2003-03-11 | 52 | 46 | 6 | ND |
| 2003-08-20 | 35 | 35 | 2.7 | ND |
| 2005-04-22 | 23 | 23 | 0.9J | ND |

### MW-1B-00

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2001-03-09 | 44 | 42 | 6 | ND |
| 2002-06-26 | 38 | 33 | 3.8 | ND |
| 2003-03-17 | 28 | 30 | 3.9 | ND |
| 2003-08-18 | 26 | 38 | 2.4 | ND |
| 2004-11-23 | 12 | 20 | 0.7J | ND |
| 2005-04-22 | 14 | 21 | 1.1 | ND |
| 2014-09-11 | 7.2 | ND | ND | ND |
| 2016-03-22 | 8 | 5.7 | ND | ND |
| 2016-06-21 | ND | ND | ND | ND |
| 2016-09-20 | 7.6 | 6 | ND | ND |
| 2017-12-07 | 7 | ND | ND | ND |
| 2018-03-27 | 7.4 | ND | ND | ND |
| 2018-12-12 | 7 | 2.4 | ND | ND |

### OS-7B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-07 | 980 | 220 | 240 | 41 |
| 2003-08-15 | **2** | 120 | 190 | 29J |
| 2005-04-20 | 500 | 38 | 160J | 33 |
| 2014-09-09 | **1.7D** | 160 | 128 | 1.6 |
| 2016-03-21 | **3.1D** | 463D | 473D | 90.2 |
| 2016-06-24 | 588D | 164 | 188D | ND |
| 2016-09-21 | 155* | ND | ND | ND |
| 2016-12-13 | 289D | ND | ND | ND |

### OS-6B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-03-07 | 160 | 54 | 3.5 | ND |
| 2003-08-15 | 150 | 53J | 4 | ND |
| 2005-04-20 | 130 | 53 | 3.7J | ND |
| 2014-09-10 | 44.4 | 13.3 | ND | ND |

### OS-7B-R

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-25 | 49.2 | 12.4 | ND | ND |
| 2016-03-21 | 16.4 | 8.4 | ND | ND |
| 2016-06-22 | ND | ND | 7.8 | ND |
| 2016-09-23 | 8.4 | 10 | ND | ND |
| 2017-12-07 | 7.1* | ND | ND | ND |
| 2018-03-27 | 7 | ND | ND | ND |
| 2018-12-10 | 5.6 | ND | ND | ND |
| 2019-03-11 | 10.6 | 2.6 | ND | ND |
| 2019-09-12 | 4 | ND | ND | ND |
| 2020-03-18 | 6.2 | 1.1 | ND | ND |

### MW-74D

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2015-02-24 | 214D | 84.4 | ND | ND |
| 2016-03-22 | 76.5 | 81.6 | 10.8 | ND |
| 2016-06-23 | 19.4 | 20.7 | 54.1 | ND |
| 2016-09-22 | 123 | 89.6 | ND | ND |
| 2017-12-06 | 177 | 80.9 | ND | ND |
| 2018-03-29 | 123 | 70.2 | 4 | ND |
| 2018-12-10 | 3 | 1.9 | ND | ND |
| 2019-03-11 | 131 | 72.2 | 3.3 | ND |

## LEGEND

East Phase Boundary
West Phase Boundary

MCL Exceedance
- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:
1. Bold results are mg/L and others are ug/L
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UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N
0 125 250 375
Feet

SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 7
UPPER AQUIFER (TOP OF TILL)
WEBSTER CORRIDOR
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 |
|---|---|

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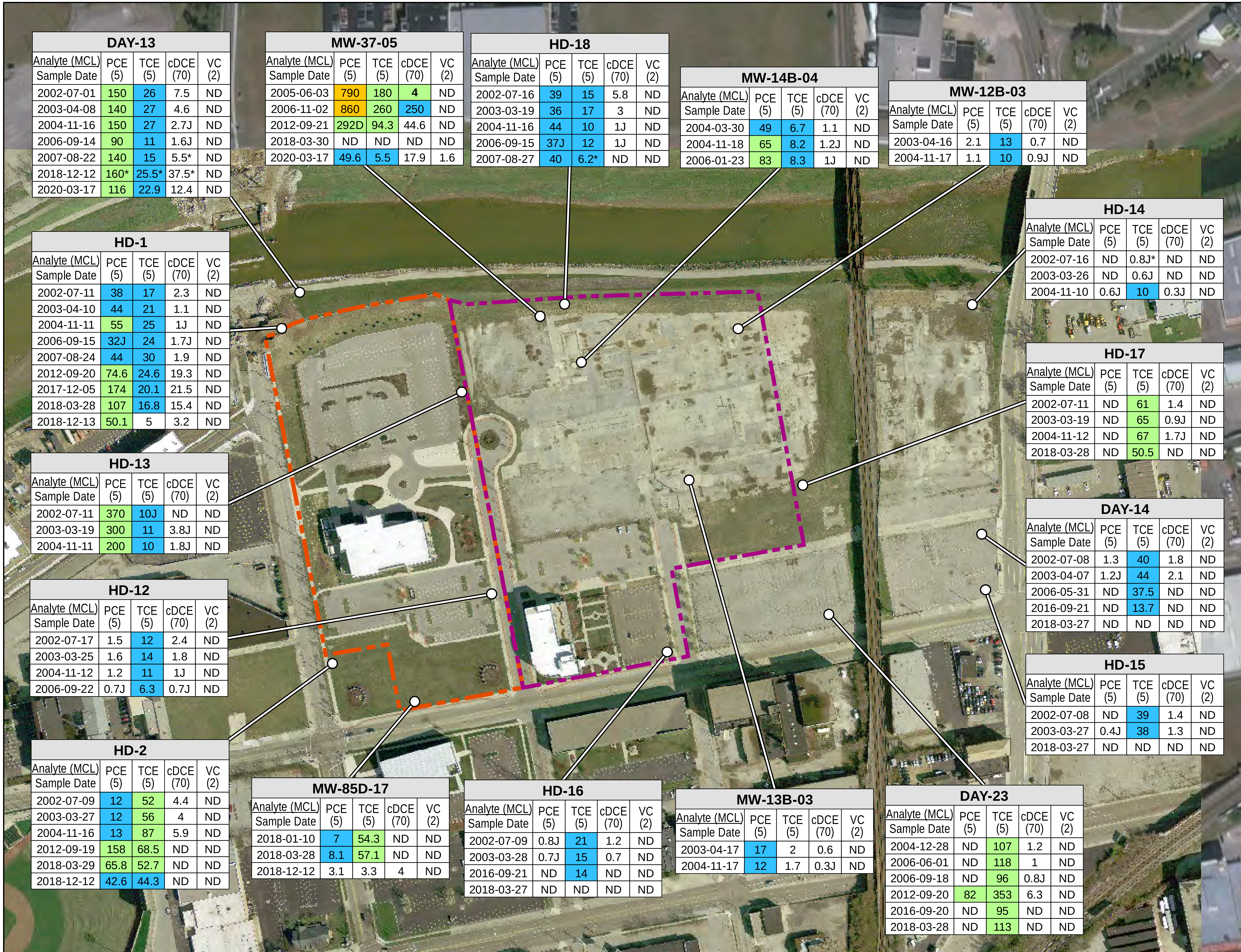

### DAY-13

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-01 | 150 | 26 | 7.5 | ND |
| 2003-04-08 | 140 | 27 | 4.6 | ND |
| 2004-11-16 | 150 | 27 | 2.7J | ND |
| 2006-09-14 | 90 | 11 | 1.6J | ND |
| 2007-08-22 | 140 | 15 | 5.5* | ND |
| 2018-12-12 | 160* | 25.5* | 37.5* | ND |
| 2020-03-17 | 116 | 22.9 | 12.4 | ND |

### MW-37-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-06-03 | 790 | 180 | 4 | ND |
| 2006-11-02 | 860 | 260 | 250 | ND |
| 2012-09-21 | 292D | 94.3 | 44.6 | ND |
| 2018-03-30 | ND | ND | ND | ND |
| 2020-03-17 | 49.6 | 5.5 | 17.9 | 1.6 |

### HD-18

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-16 | 39 | 15 | 5.8 | ND |
| 2003-03-19 | 36 | 17 | 3 | ND |
| 2004-11-16 | 44 | 10 | 1J | ND |
| 2006-09-15 | 37J | 12 | 1J | ND |
| 2007-08-27 | 40 | 6.2* | ND | ND |

### MW-14B-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-30 | 49 | 6.7 | 1.1 | ND |
| 2004-11-18 | 65 | 8.2 | 1.2J | ND |
| 2006-01-23 | 83 | 8.3 | 1J | ND |

### MW-12B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-16 | 2.1 | 13 | 0.7 | ND |
| 2004-11-17 | 1.1 | 10 | 0.9J | ND |

### HD-1

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-11 | 38 | 17 | 2.3 | ND |
| 2003-04-10 | 44 | 21 | 1.1 | ND |
| 2004-11-11 | 55 | 25 | 1J | ND |
| 2006-09-15 | 32J | 24 | 1.7J | ND |
| 2007-08-24 | 44 | 30 | 1.9 | ND |
| 2012-09-20 | 74.6 | 24.6 | 19.3 | ND |
| 2017-12-05 | 174 | 20.1 | 21.5 | ND |
| 2018-03-28 | 107 | 16.8 | 15.4 | ND |
| 2018-12-13 | 50.1 | 5 | 3.2 | ND |

### HD-14

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-16 | ND | 0.8J* | ND | ND |
| 2003-03-26 | ND | 0.6J | ND | ND |
| 2004-11-10 | 0.6J | 10 | 0.3J | ND |

### HD-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-11 | ND | 61 | 1.4 | ND |
| 2003-03-19 | ND | 65 | 0.9J | ND |
| 2004-11-12 | ND | 67 | 1.7J | ND |
| 2018-03-28 | ND | 50.5 | ND | ND |

### HD-13

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-11 | 370 | 10J | ND | ND |
| 2003-03-19 | 300 | 11 | 3.8J | ND |
| 2004-11-11 | 200 | 10 | 1.8J | ND |

### DAY-14

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-08 | 1.3 | 40 | 1.8 | ND |
| 2003-04-07 | 1.2J | 44 | 2.1 | ND |
| 2006-05-31 | ND | 37.5 | ND | ND |
| 2016-09-21 | ND | 13.7 | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

### HD-12

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-17 | 1.5 | 12 | 2.4 | ND |
| 2003-03-25 | 1.6 | 14 | 1.8 | ND |
| 2004-11-12 | 1.2 | 11 | 1J | ND |
| 2006-09-22 | 0.7J | 6.3 | 0.7J | ND |

### HD-15

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-08 | ND | 39 | 1.4 | ND |
| 2003-03-27 | 0.4J | 38 | 1.3 | ND |
| 2018-03-27 | ND | ND | ND | ND |

### HD-2

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-09 | 12 | 52 | 4.4 | ND |
| 2003-03-27 | 12 | 56 | 4 | ND |
| 2004-11-16 | 13 | 87 | 5.9 | ND |
| 2012-09-19 | 158 | 68.5 | ND | ND |
| 2018-03-29 | 65.8 | 52.7 | ND | ND |
| 2018-12-12 | 42.6 | 44.3 | ND | ND |

### MW-85D-17

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2018-01-10 | 7 | 54.3 | ND | ND |
| 2018-03-28 | 8.1 | 57.1 | ND | ND |
| 2018-12-13 | 3.1 | 3.3 | 4 | ND |

### HD-16

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-09 | 0.8J | 21 | 1.2 | ND |
| 2003-03-28 | 0.7J | 15 | 0.7 | ND |
| 2016-09-21 | ND | 14 | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

### MW-13B-03

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2003-04-17 | 17 | 2 | 0.6 | ND |
| 2004-11-17 | 12 | 1.7 | 0.3J | ND |

### DAY-23

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-12-28 | ND | 107 | 1.2 | ND |
| 2006-06-01 | ND | 118 | 1 | ND |
| 2006-09-18 | ND | 96 | 0.8J | ND |
| 2012-09-20 | 82 | 353 | 6.3 | ND |
| 2016-09-20 | ND | 95 | ND | ND |
| 2018-03-28 | ND | 113 | ND | ND |

## LEGEND

East Phase Boundary

West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:

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N

0 125 250 375

Feet

SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 8
UPPER AQUIFER (TOP OF TILL)
EAST OF WEBSTER AVE
FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

| APR 2020 | PROJECT NO 12473.005.008.0450 |
|---|---|

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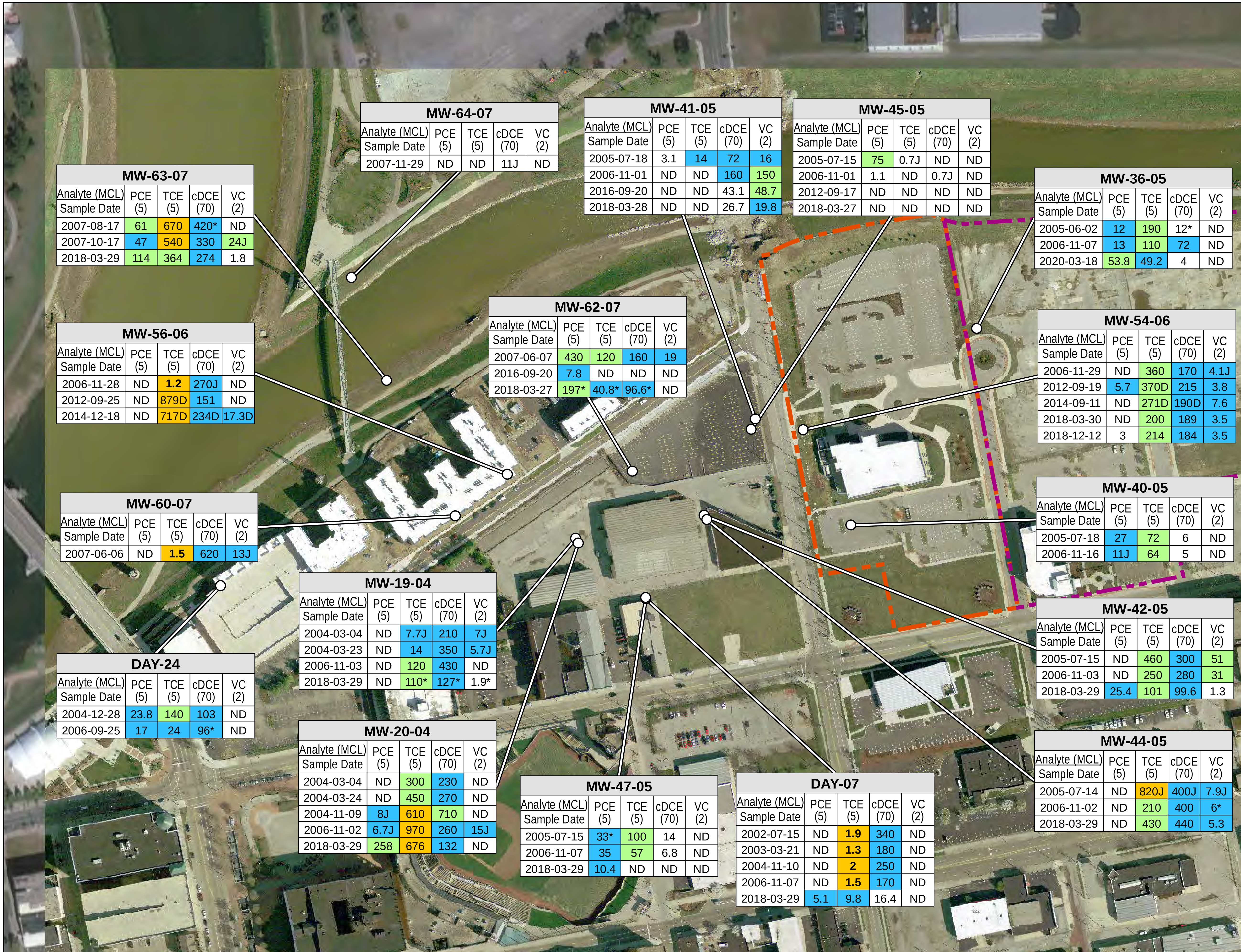


**MW-64-07**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-11-29 | ND | ND | 11J | ND |

**MW-63-07**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-08-17 | 61 | 670 | 420* | ND |
| 2007-10-17 | 47 | 540 | 330 | 24J |
| 2018-03-29 | 114 | 364 | 274 | 1.8 |

**MW-56-06**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-11-28 | ND | **1.2** | 270J | ND |
| 2012-09-25 | ND | 879D | 151 | ND |
| 2014-12-18 | ND | 717D | 234D | 17.3D |

**MW-60-07**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-06 | ND | **1.5** | 620 | 13J |

**DAY-24**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-12-28 | 23.8 | 140 | 103 | ND |
| 2006-09-25 | 17 | 24 | 96* | ND |

**MW-41-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-18 | 3.1 | 14 | 72 | 16 |
| 2006-11-01 | ND | ND | 160 | 150 |
| 2016-09-20 | ND | ND | 43.1 | 48.7 |
| 2018-03-28 | ND | ND | 26.7 | 19.8 |

**MW-45-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-15 | 75 | 0.7J | ND | ND |
| 2006-11-01 | 1.1 | ND | 0.7J | ND |
| 2012-09-17 | ND | ND | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

**MW-36-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-06-02 | 12 | 190 | 12* | ND |
| 2006-11-07 | 13 | 110 | 72 | ND |
| 2020-03-18 | 53.8 | 49.2 | 4 | ND |

**MW-62-07**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-07 | 430 | 120 | 160 | 19 |
| 2016-09-20 | 7.8 | ND | ND | ND |
| 2018-03-27 | 197* | 40.8* | 96.6* | ND |

**MW-54-06**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-11-29 | ND | 360 | 170 | 4.1J |
| 2012-09-19 | 5.7 | 370D | 215 | 3.8 |
| 2014-09-11 | ND | 271D | 190D | 7.6 |
| 2018-03-30 | ND | 200 | 189 | 3.5 |
| 2018-12-12 | 3 | 214 | 184 | 3.5 |

**MW-40-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-18 | 27 | 72 | 6 | ND |
| 2006-11-16 | 11J | 64 | 5 | ND |

**MW-42-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-15 | ND | 460 | 300 | 51 |
| 2006-11-03 | ND | 250 | 280 | 31 |
| 2018-03-29 | 25.4 | 101 | 99.6 | 1.3 |

**MW-19-04**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-04 | ND | 7.7J | 210 | 7J |
| 2004-03-23 | ND | 14 | 350 | 5.7J |
| 2006-11-03 | ND | 120 | 430 | ND |
| 2018-03-29 | ND | 110* | 127* | 1.9* |

**MW-20-04**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-04 | ND | 300 | 230 | ND |
| 2004-03-24 | ND | 450 | 270 | ND |
| 2004-11-09 | 8J | 610 | 710 | ND |
| 2006-11-02 | 6.7J | 970 | 260 | 15J |
| 2018-03-29 | 258 | 676 | 132 | ND |

**MW-47-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-15 | 33* | 100 | 14 | ND |
| 2006-11-07 | 35 | 57 | 6.8 | ND |
| 2018-03-29 | 10.4 | ND | ND | ND |

**DAY-07**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2002-07-15 | ND | **1.9** | 340 | ND |
| 2003-03-21 | ND | **1.3** | 180 | ND |
| 2004-11-10 | ND | **2** | 250 | ND |
| 2006-11-07 | ND | **1.5** | 170 | ND |
| 2018-03-29 | 5.1 | 9.8 | 16.4 | ND |

**MW-44-05**

| Analyte (MCL) / Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-14 | ND | 820J | 400J | 7.9J |
| 2006-11-02 | ND | 210 | 400 | 6* |
| 2018-03-29 | ND | 430 | 440 | 5.3 |

## LEGEND

East Phase Boundary

West Phase Boundary

**MCL Exceedance**

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

Notes:
1. Bold results are mg/L and others are ug/L
2. Values posted are the maximum between the original and duplicate sample results. An * signifies a result from a duplicate sample.
3. Darker gray table headers signify UAI samples.

Abbreviations:
ND = not detected
NR = no result
MCL = maximum contaminant level
mg/L = milligrams per liter
ug/L = micrograms per liter
UAI = upper aquifer well screened in the intermediate zone
PCE = tetrachloroethene
TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

WESTON SOLUTIONS

FIGURE 9
TILL RICH ZONE

FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020 | PROJECT NO 12473.005.008.0450

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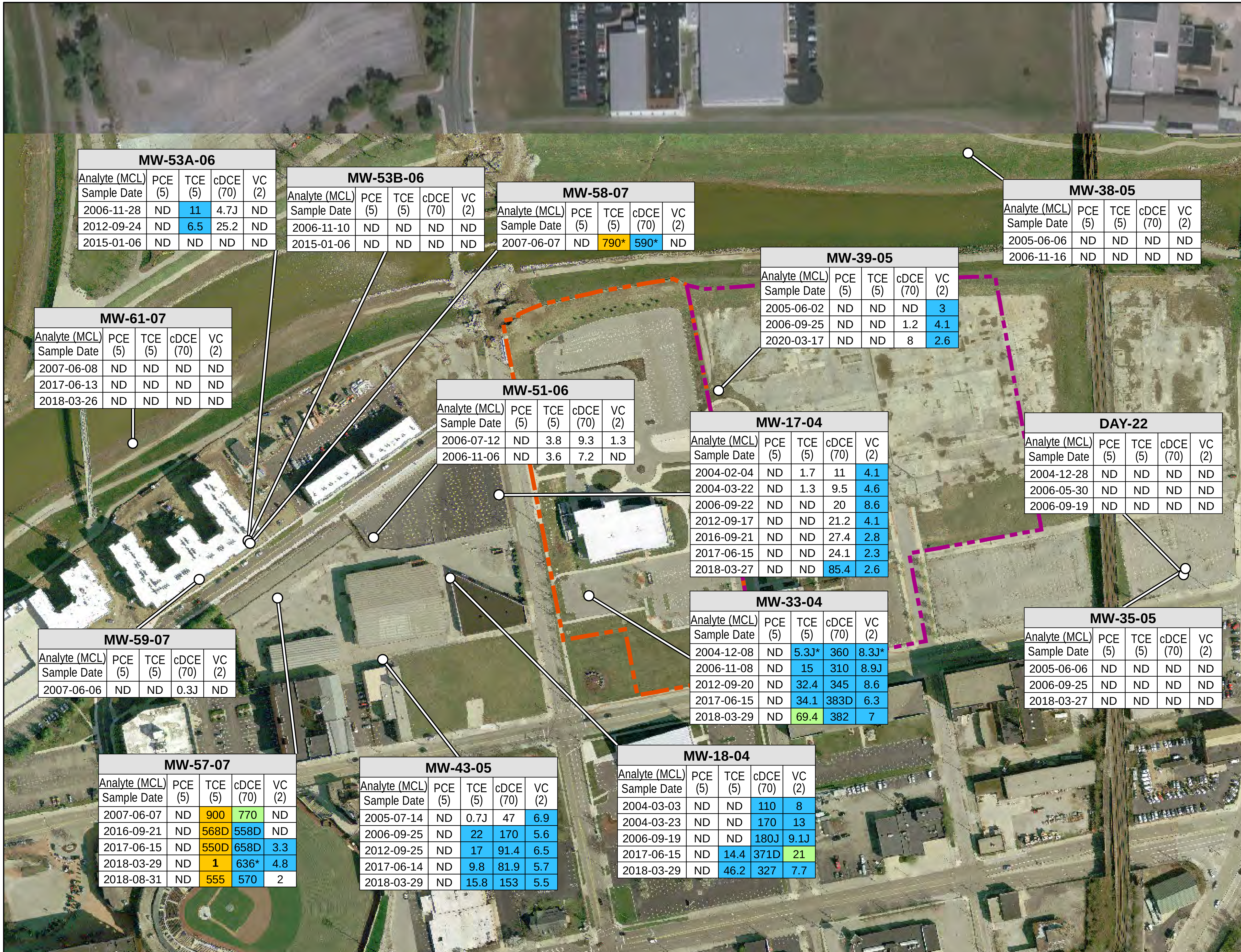

### MW-53A-06

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-11-28 | ND | 11 | 4.7J | ND |
| 2012-09-24 | ND | 6.5 | 25.2 | ND |
| 2015-01-06 | ND | ND | ND | ND |

### MW-53B-06

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-11-10 | ND | ND | ND | ND |
| 2015-01-06 | ND | ND | ND | ND |

### MW-58-07

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-07 | ND | 790* | 590* | ND |

### MW-38-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-06-06 | ND | ND | ND | ND |
| 2006-11-16 | ND | ND | ND | ND |

### MW-39-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-06-02 | ND | ND | ND | 3 |
| 2006-09-25 | ND | ND | 1.2 | 4.1 |
| 2020-03-17 | ND | ND | 8 | 2.6 |

### MW-61-07

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-08 | ND | ND | ND | ND |
| 2017-06-13 | ND | ND | ND | ND |
| 2018-03-26 | ND | ND | ND | ND |

### MW-51-06

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2006-07-12 | ND | 3.8 | 9.3 | 1.3 |
| 2006-11-06 | ND | 3.6 | 7.2 | ND |

### MW-17-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-02-04 | ND | 1.7 | 11 | 4.1 |
| 2004-03-22 | ND | 1.3 | 9.5 | 4.6 |
| 2006-09-22 | ND | ND | 20 | 8.6 |
| 2012-09-17 | ND | ND | 21.2 | 4.1 |
| 2016-09-21 | ND | ND | 27.4 | 2.8 |
| 2017-06-15 | ND | ND | 24.1 | 2.3 |
| 2018-03-27 | ND | ND | 85.4 | 2.6 |

### DAY-22

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-12-28 | ND | ND | ND | ND |
| 2006-05-30 | ND | ND | ND | ND |
| 2006-09-19 | ND | ND | ND | ND |

### MW-33-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-12-08 | ND | 5.3J* | 360 | 8.3J* |
| 2006-11-08 | ND | 15 | 310 | 8.9J |
| 2012-09-20 | ND | 32.4 | 345 | 8.6 |
| 2017-06-15 | ND | 34.1 | 383D | 6.3 |
| 2018-03-29 | ND | 69.4 | 382 | 7 |

### MW-35-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-06-06 | ND | ND | ND | ND |
| 2006-09-25 | ND | ND | ND | ND |
| 2018-03-27 | ND | ND | ND | ND |

### MW-59-07

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-06 | ND | ND | 0.3J | ND |

### MW-57-07

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2007-06-07 | ND | 900 | 770 | ND |
| 2016-09-21 | ND | 568D | 558D | ND |
| 2017-06-15 | ND | 550D | 658D | 3.3 |
| 2018-03-29 | ND | 1 | 636* | 4.8 |
| 2018-08-31 | ND | 555 | 570 | 2 |

### MW-43-05

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2005-07-14 | ND | 0.7J | 47 | 6.9 |
| 2006-09-25 | ND | 22 | 170 | 5.6 |
| 2012-09-25 | ND | 17 | 91.4 | 6.5 |
| 2017-06-14 | ND | 9.8 | 81.9 | 5.7 |
| 2018-03-29 | ND | 15.8 | 153 | 5.5 |

### MW-18-04

| Analyte (MCL) Sample Date | PCE (5) | TCE (5) | cDCE (70) | VC (2) |
|---|---|---|---|---|
| 2004-03-03 | ND | ND | 110 | 8 |
| 2004-03-23 | ND | ND | 170 | 13 |
| 2006-09-19 | ND | ND | 180J | 9.1J |
| 2017-06-15 | ND | 14.4 | 371D | 21 |
| 2018-03-29 | ND | 46.2 | 327 | 7.7 |

## LEGEND

East Phase Boundary
West Phase Boundary

MCL Exceedance

- <=1x
- 1.01-10x
- 10.01-100x
- 100.01-1,000x
- >1,000.01x

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TCE = trichloroethylene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride

N

0 125 250 375
Feet

SOURCE: City of Dayton Aerial Imagery

WESTON SOLUTIONS

FIGURE 10
LOWER AQUIFER

FORMER GM DELPHI HARRISON
THERMAL SYSTEMS FACILITY
DAYTON, OHIO

APR 2020 | PROJECT NO 12473.005.008.0450

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